

Pertanika Journal of

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Pertanika Journal of Social Sciences & Humanities
Pertanika Journal of Social Sciences & Humanities

PERTANIKA JOURNAL OF SOCIAL SCIENCES & HUMANITIES

About the Journal

Overview

Pertanika Journal of Social Sciences & Humanities is the official journal of Universiti Putra Malaysia. It is an open-access online scientific journal. It publishes original scientific outputs. It neither accepts nor commissions third party content.

Recognised internationally as the leading peer-reviewed interdisciplinary journal devoted to the publication of original papers, it serves as a forum for practical approaches to improve quality on issues pertaining to social and behavioural sciences as well as the humanities.

Pertanika Journal of Social Sciences & Humanities currently publishes 6 issues a year (*February*, *April*, *June*, *August, October* and *December*) periodical that considers for publication original articles as per its scope. The journal publishes in **English** as well as in **Bahasa Melayu** and it is open for submission by authors from all over the world.

The journal is available world-wide.

Aims and Scope

Pertanika Journal of Social Sciences & Humanities aims to develop as a pioneer journal for the social sciences with a focus on emerging issues pertaining to the social and behavioural sciences as well as the humanities. Areas relevant to the scope of the journal include Social Sciences—architecture and habitat, consumer and family economics, consumer law, education, media and communication studies, political sciences and public policy, population studies, psychology, sociology, and tourism; Humanities—arts and culture, dance, language and linguistics, literature, music, philosophy, and sports.

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Pertanika Journal of Social Sciences & Humanities was founded in 1993 and focusses on research in social and behavioural sciences as well as the humanities and its related fields.

Vision

To publish journal of international repute.

Mission

Our goal is to bring the highest quality research to the widest possible audience.

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We aim for excellence, sustained by a responsible and professional approach to journal publishing. Submissions can expect to receive a decision within 120 days. The elapsed time from submission to publication for the articles averages 180 days. We are working towards decreasing the processing time with the help of our editors and the reviewers.

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Pertanika Journal of Social Sciences & Humanities is now over 32 years old; this accumulated knowledge and experience has resulted the journal being abstracted and indexed in SCOPUS (Elsevier), Clarivate Web of Science (ESCI), EBSCO, DOAJ, Agricola, ASEAN CITATION INDEX, ISC, Microsoft Academic, Google Scholar, and MyCite.

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The abbreviation for Pertanika Journal of Social Sciences & Humanities is *Pertanika J. Soc. Sci. & Hum.*

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Most scientific papers are prepared according to a format called IMRAD. The term represents the first letters of the words ***I**ntroduction*, ***M**aterials and Methods*, ***R**esults*, ***A**nd **D**iscussion*. IMRAD is simply a more 'defined' version of the "IBC" (*Introduction*, *Body*, *Conclusion*) format used for all academic writing. IMRAD indicates a pattern or format rather than a complete list of headings or components of research papers; the missing parts of a paper are: *Title*, *Authors*, *Keywords*, *Abstract*, *Conclusions*, *References*, and *Acknowledgement*. Additionally, some papers include *Appendices*. For manuscripts in **Bahasa Malaysia**, the title, abstract and keywords should be written in both **English** and **Bahasa Malaysia**.

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The *Introduction* explains the scope and objective of the study in the light of current knowledge on the subject; the *Materials and Methods* describes how the study was conducted; the *Results* section reports what was found in the study; and the *Discussion* section explains meaning and significance of the results and provides suggestions for future directions of research. The manuscript must be prepared according to the journal's **Instruction to Authors** (http://www.pertanika.upm.edu.my/Resources/regular_issues/Regular_Issues_Instructions_to_Authors.pdf).

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Authors who complete any submission are notified with an acknowledgement containing a manuscript ID on receipt of a manuscript, and upon the editorial decision regarding publication.

Pertanika follows a **double-blind peer -review process**. Manuscripts deemed suitable for publication are sent to reviewers. Authors are encouraged to suggest names of at least 3 potential reviewers at the time of submission of their manuscripts to *Pertanika*, but the editors will make the final selection and are not, however, bound by these suggestions.

Notification of the editorial decision is usually provided within 120 days from the receipt of manuscript. Publication of solicited manuscripts is not guaranteed. In most cases, manuscripts are accepted conditionally, pending an author's revision of the material.

As articles are double-blind reviewed, material that may identify authorship of the paper should be placed only on page 2 as described in the first-4-page format in Pertanika's Instruction to Authors (http://www.pertanika.upm.edu.my/Resources/regular_issues/Regular_Issues_Instructions_to_Authors.pdf).

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2. The Chief Executive Editor sends the article-identifying information having been removed, to 2 to 3 reviewers. They are specialists in the subject matter of the article. The Chief Executive Editor requests that they complete the review within 3 weeks.

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authors. If a revision is indicated, the editor provides guidelines to the authors to attend to the reviewers' suggestions and perhaps additional advice about revising the manuscript.

4. The authors decide whether and how to address the reviewers' comments and criticisms and the editor's concerns. The authors return a revised version of the paper to the Chief Executive Editor along with specific information describing how they have addressed the concerns of the reviewers and the editor, usually in a tabular form. The authors may also submit a rebuttal if there is a need especially when the authors disagree with certain comments provided by the reviewers.
5. The Chief Executive Editor sends the revised manuscript out for re-review. Typically, at least 1 of the original reviewers will be asked to examine the article.
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Foreword

Welcome to the fifth issue of 2026 of the Pertanika Journal of Social Sciences and Humanities (PJSSH)!

PJSSH is an open-access journal for studies in the field of Social Sciences and Humianities published by Universiti Putra Malaysia Press. It is independently owned and managed by the university for the benefit of the world-wide science community.

This issue contains 25 articles: one case study; five review articles; and the rest are regular articles. The authors of these articles come from different countries namely Burkina Faso, China, India, Indonesia, Malaysia, Pakistan, South Korea, Thailand, UAE (United Arab Emirates) dan Uzbekistan.

One contribution, "Actor Logics and Urban Informality in the Context of Subdivision Operations in Koudougou (Burkina Faso)," examines the interests and actions of different actors involved in the emergence of informal settlements during subdivision operations. Drawing on primary and secondary data, the study finds that the illicit allocation of land plots at the expense of rightful owners can generate public indignation and planning conflicts. Such conflicts interrupt subdivision operations and contribute to urban informality, both in the physical form of the city and in the practices of local planning actors. The article highlights the importance of understanding the relationships among land allocation, competing interests and urban planning processes. Further details of this study can be found on page 2441.

Another significant contribution is "Nationalist Narratives in Sports Event Reporting: A Systematic Literature Review." Synthesising 14 peer-reviewed articles published between January 2021 and April 2025, the review examines how sports media represent nationalism and national identity. The findings show that sporting achievements, athletes and international competitions are connected with national meaning through heroic narratives, binary opposition and emotional mobilisation. The review also highlights how race, gender, immigration, citizenship, disability and geopolitical context shape the boundaries of national belonging. It identifies gaps in audience reception, digital-platform communication, cross-cultural comparison and geographical coverage, providing directions for future research. Further information on this study is presented on page 2569.

The article "Tajweed Learning With Web-Based Recitation Programme: Its Effectivity, Perception, and Effect for Online Learning During and After COVID-19" This article examines a web-based recitation programme for learning Tajweed and compares its effectiveness with traditional instruction. The study involved 88 first-year students enrolled in an Islamic Religious Education course at an Indonesian university, divided into a control group and two experimental groups. Students' conceptual understanding was assessed through pre- and post-tests, while questionnaires measured their perceptions of the programme. The findings indicate that the group using the programme independently showed improvement, whereas the control group and the experimental group with facilitator support did not show significant improvement. The study offers insight into the potential of web-based feedback tools for Qur'anic recitation learning. Further details of this study can be found on page 2629.

We anticipate that you will find the evidence presented in this issue to be intriguing, thought-provoking and useful in reaching new milestones in your own research. Please recommend the journal to your colleagues and students to make this endeavour meaningful.

All the papers published in this edition underwent Pertanika's stringent peer-review process involving a minimum of two reviewers comprising internal as well as external referees. This was to ensure that the quality of the papers justified the high ranking of the journal, which is renowned as a heavily-cited journal not only by authors and researchers in Malaysia but by those in other countries around the world as well.

We would also like to express our gratitude to all the contributors, namely the authors, reviewers, and Editorial Board Members of PJSSH, who have made this issue possible.

PJSSH is currently accepting manuscripts for upcoming issues based on original qualitative or quantitative research that opens new areas of inquiry and investigation.

Editor-in-Chief
Puvaneswaran Kunasekaran

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The Transformation of Xu Beihong's Portrait Paintings During His Singapore Years

Zuzhi Wu and Sarena Abdullah*

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ABSTRACT

Xu Beihong visited or resided in Singapore at least six times in his lifetime. During his time in Singapore, he created a large number of portrait works, including oil paintings, sketches, and Chinese paintings, among which oil painting portraits are the most well-known. However, existing academic research on Xu Beihong's portrait creation mostly focuses on his works during his time in China or when he was studying abroad in Europe. For his works created in Southeast Asia, especially in Singapore, research is still relatively limited. This study aims to use a combination of archival research and case studies to systematically review and comprehensively analyse the portrait works created by Xu Beihong in Singapore. Drawing on the concept of Patronage Economy, the paper examines how Xu's portrait practice shifted from French Academic Salon conventions toward a diasporic hybridity shaped by local commissioning culture and wartime contexts. The analysis focuses on three dimensions of transformation: the dual-mode background treatment (functional vs. symbolic), the intermedia translation from street performance to high-art canvas (as seen in *Put Down Your Whip*), and the negotiation between client expectations and artistic choices. This paper argues that these changes in style are not just the result of artistic development; they are the result of negotiation and compromise between Xu's academic training and the cultural and political expectations inherent in Singapore's commissioned portrait economy.

Keywords: Patronage economy, portrait paintings, Singapore, transformation, Xu Beihong

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INTRODUCTION

Xu Beihong was one of the most influential painters and art educators in 20th-century China, known as the "father of modern Chinese painting" (Xu, 2020). His artistic career spans across Europe and Asia, and his trip to Singapore played a crucial significance in his artistic development.

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The connection between Xu Beihong and Singapore began in 1925. At that time, he did not have enough living expenses in Paris, so he went to Singapore on the advice of a friend to create portraits of local overseas Chinese leaders and wealthy businessmen in order to make a living. Afterwards, especially between 1939 and 1941, Xu Beihong returned to Singapore to raise funds for the Anti-Japanese War and created a large number of portraits during this period. The creation during this period was an important part of his artistic career and manifested his artistic exchange within the context of Southeast Asia. Therefore, Singapore was not only a key node in his early artistic exploration but also witnessed the unfolding of his artistic achievements thereafter. However, the existing scholarships tend to portray Xu Beihong as a fearless genius who acted upon the passive overseas Chinese market. This paper reexamines this relationship and believes that Singapore's commissioned portraits are an active place for socio-economic exchanges and artistic taste negotiations. Chinese scholar Hua (2023) believes that the Singapore period was the pinnacle of his artistic creation. Xu Beihong's student Yang (2018) also holds a similar view, stating that "in his three peak years, hundreds of works were created in Singapore, the Malay Peninsula, and India". Therefore, this paper will focus on Xu Beihong's portrait painting that he produced in Singapore, exploring the unique style and artistic value of his works during this period.

This paper will examine how Xu Beihong's Singapore production should not be read merely as the activity of a solitary artist responding to a passive diaspora market, but he commissioned portraiture also functioned as an active socio-economic transaction in which taste and representational acceptability were negotiated. To conceptualise this dynamic, the study reframes the Singapore period through the lens of a "patronage economy", emphasising how British-colonial conditions and the precarious socio-political identity of Nanyang Chinese merchant elites (*towkays*) shaped what kinds of images they sought and how they validated them through commissioning art. The concept of patronage economy in art historical analysis draws on the sociological framework of art as a field of negotiated production, in which aesthetic decisions are shaped by patron-client relations and the circulation of symbolic capital (Baxandall, 1988; Bourdieu, 1993).

Academic research on Xu Beihong has mainly focused on his works from his time abroad and in China and Europe, with less attention paid to his artistic creations in Southeast Asia, especially in Singapore. For instance, scholar Au Yeung Hing Yee (2008) emphasises how "Xu Beihong's research in Singapore can also be seen as an extension of Chinese art history" that can serve as part of the narrative on the overseas exchanges and influences of local painters in the history of modern and contemporary Chinese art.

In the context of portraiture studies, the intertwining of social resources and wartime conditions led Xu Beihong to accept a considerable number of portrait commissions from local wealthy merchants

and political figures, a pattern that warrants further research. The Chinese community in Singapore at that time focused more on culture, art, and identity recognition, and used custom portrait paintings to show their status and emotional identity. Rather than treating these patrons as passive recipients, this study positions these commissioners as active agents whose capital and cultural-political concerns actively dictated aesthetic terms and the desired moral-symbolic content of portrait images in Singapore at that time. Although there have been several studies on his work, there is still no systematic review of his artistic practices in Singapore (Cao, 2020; Hua, 2023; Liu, 2021; Liu & Liu, 2018; Shang, 2021; Shao, 2018). In comparison with his works in China and during his stay in France (1919-1927), the portrait paintings that he produced during this period are unique, as they not only focused on the realistic depiction of people's temperament, but these portraits also reflected how he integrated the aesthetic needs of local society, which resulted in the contributive evolution of his own style.

To examine the context of his portrait paintings, this study will not only trace the relations between Xu Beihong and Singapore and the reasons for his stay; it will also discuss changes in the form, techniques, and themes of his portrait paintings in Singapore, as well as the evolution of his artistic style. As such, this paper will demonstrate how these portraitures can also be examined as a site of artistic interaction between the Nanyang Chinese community and the situation of the times, through Xu Beihong's artistic process.

As such, this study raises a core analytical question: to what extent does internal artistic evolution drive Xu Beihong's stylistic innovation, and to what extent is it affected by customer-driven aesthetic compliance and negotiated taste in the sponsorship economy? This issue guides how to link the style change and artistic development with the socio-economic logic of commissioned portraits in colonial Singapore. This paper will discuss the question: how do Singapore's unique social structure and geographical environment affect the theme and style of portraiture? Is there any change in the style of the portraits created by Xu Beihong in Singapore and his works in other periods? To what extent can this change be explained by customer expectations and sponsorship negotiations rather than by art development itself? What are the typical characteristics and contemporary values of his portraits in Singapore?

This study fills the gap in academic research on Xu Beihong's artistic creation during his Singapore period and deepens our overall understanding of his artistic career. By systematically studying Xu Beihong's creations during this time, we can, on the one hand, gain insight into how he absorbed, adapted, and innovated in different geographical and cultural contexts, and on the other hand, provide a new perspective for exploring the activities and influence of modern Chinese artists in Southeast Asia.

LITERATURE REVIEW

Xu Beihong's Trip to Singapore and His Fundraising Art Exhibition

There are differing views within the academic community on how many times Xu Beihong has passed through Singapore or temporarily resided there. Local Singaporean newspapers and media believed that Xu Beihong visited Singapore at least five times (Li, 1990). However, scholar Shao Xiaofeng (2018) believed that Xu Beihong visited Singapore more than ten times in his lifetime and established an inseparable connection with Nanyang[1]. In early 1939, Xu Beihong painted a sketch portrait for Huang Manshi's fiftieth birthday, in which it was inscribed with "Beihong visited Singapore six times"; indicating that Xu Beihong's encounters with Singapore were at least six times (Au Yeung, 1985a). However, the academic community generally agrees that Xu Beihong made only two significant trips to Singapore. First, in 1925, due to his financial difficulties, he travelled from Paris to Singapore upon the recommendation of Huang Menggui, intending to create portraits for local overseas Chinese leaders and affluent merchants, thereby securing adequate financial backing for himself. Second, in 1939, with the full outbreak of the Anti-Japanese War in China, he went from China to Singapore to hold a fundraising art exhibition to support China's Anti-Japanese War. This 1939 trip to Singapore was the longest and significantly influenced the Chinese community there, particularly among young artists (Au Yeung, 1985b).

In early 1939, in a letter to his son and daughter before his departure, Xu Beihong explained the reason for his trip to Singapore, "Because I want to fulfill my personal obligation to the country, so I want to go to Nanyang to sell paintings and donate them to the country..." (Wang, 2006). He arrived on January 9, 1939, and garnered significant attention from both local Chinese and foreign media. Prominent Chinese and foreign newspapers successively reported on the announcement of his upcoming art exhibition in Singapore (Renowned painter Xu Beihong arrived in Singapore yesterday, 1939).

The Xu Beihong's Singapore fund-raising art exhibition was initially held at the Victoria Memorial Hall on March 15 and 16, 1939, and then moved to the Singapore Chinese Chamber of Commerce & Industry from March 18 to 26, lasting a total of 10 days. The exhibited works included those produced during his studies in France, his works produced at Central University after returning to China, and his recent works, totaling 172 pieces. The types of works included oil paintings, traditional Chinese paintings, and sketches. Among these works, the proportion of portrait paintings was very high, as many as twenty-four portrait sketches (a total of twenty-six sketches were exhibited, except for two creative sketches; the rest were all portrait painting

[1] "Nanyang" is a historical and geographical concept referring to the maritime and land regions south of traditional China, including Southeast Asia and the surrounding seas. It specifically encompasses the present-day ASEAN countries such as Singapore, Malaysia, Indonesia, Thailand, Vietnam, the Philippines, and others.

sketches), ten oil portrait paintings, and five pastel portrait paintings (The Governor and military and political officials today visited Xu Beihong Art Exhibition, 1939). The fundraising art exhibition was quite successful, and it had a wide influence on the Singapore Chinese community at that time.

> *Out of every 20 Singaporeans, one has visited the art exhibition. The scale of a painter's art exhibition, its wide scope, the large amount of fundraising, and its far-reaching artistic influence are unprecedented in the art history of Singapore and Malaya. In the subsequent decades, Xu Beihong still held several personal records for art exhibitions in Singapore.* (Singapore Art Museum, 2008).

The success of the exhibition elevated Xu Beihong's reputation in Singapore to a new level. Not only were local Chinese wealthy merchants and overseas Chinese leaders attracted to Xu Beihong's art, but even the British government administrators in Singapore, including the Governor of the Straits Settlements, also highly praised his works (Au Yeung, 1985c). Consequently, following the exhibition's conclusion, an increasing number of individuals requested that Xu Beihong create their portraits, with those making such requests representing a diverse array of professions in Singapore.

Xu Beihong's Portrait Paintings Before His Arrival in Singapore

Xu Beihong's portrait paintings reflect his exploration and practice of integrating Western academic realism techniques with Chinese painting traditions. Some scholars contend that while Xu Beihong's Chinese portrait paintings are fewer in number compared to his oil portrait paintings and sketch portraits, his Chinese portraits nonetheless reflect his practical exploration of realism and the integration of Chinese and Western art in "On the Improvement of Chinese Painting"[2].

Xu Beihong's portrait paintings can be summarised into four stages, namely the adolescence period (the initiation of traditional methods); the Shanghai period (the tentative exploration of the combination of Chinese and Western art); the 1930s (the preliminary integration of Western realist painting methods and traditional portraits); and the late period (the specific presentation of realism style) (Liu & Liu, 2018). The stylistic evolution of Xu Beihong's portrait works in Chinese painting in the different periods is clearly discernible. During his youth and the period in Shanghai, Xu Beihong's Chinese portrait paintings were influenced by his family tradition (Xu Da Zhang, 1869-1913: Xu Beihong's father, who was a well-known local painter) and

[2] The ideas “On the Improvement of Chinese Painting” was first proposed by Xu Beihong in a 1918 lecture at the Peking University Painting Research Association, the speech was published in the Peking University Daily from May 23 to 25 of the same year. At its core, Xu advocated preserving the finest elements of traditional Chinese painting, reviving techniques that were on the verge of disappearing, reforming practices he considered inadequate, supplementing existing deficiencies, and integrating selected principles and techniques from Western painting.

painters of the Shanghai School such as Ren Bonian (1840-1896).

His portrayal of people's faces tended to be realistic, and their clothes were often rendered using the traditional Chinese technique of outlining and filling in color. His overall style also bore obvious traces of traditional Chinese painting techniques. *Scattering Flowers* (1918) (Figure 1) is a portrait of the renowned Peking opera performer Mei Lanfang (1894-1961) in costume, painted by Xu Beihong in Beijing the year before he went to study in France. While the facial features and hands are rendered realistically in a Western style, and the background is executed in a wet-on-wet technique similar to watercolour, the costume is depicted using the traditional Chinese method of outlined forms filled with colour.

During Xu Beihong's stay in France, his focus of study was mainly on training in realistic sketching and oil painting techniques, and he paid attention to the accurate expression of human body structure, light-and-shade relationships, and a sense of volume. During this period, his portrait works were mainly sketching and oil painting. For example, during his time in Paris, he created oil portraits such as *Portrait of a Fan Bearer* (1920), *Portrait of an Old Woman* (1922), *Portrait of an Old Man* (1924), *Portrait of a Cat Caresser* (1924), and *Self-Portrait* (1924). Among these, *Portrait of an Old Woman* (Figure 2) was selected for the 1923 French National Fine Arts Exhibition (i.e., the Salon) and "received high praise" (Wang, 2006). The



Figure 1. Xu Beihong, *Scattering Flowers (Portrait of Mei Lanfang)*, 1918; 95 cm × 53 cm. Color on silk. (Source: Mei Lanfang Memorial Museum)

model in the painting is an elderly French woman, whose face is depicted with a serene yet weathered expression. This painting demonstrates a Rembrandt-esque use of light, with illumination from above, creating strong contrasts between light and shadow on the face and subtly and richly rendered dark areas.

Upon his return from China, particularly during his time in Nanjing, Xu Beihong entered his mature period of portrait

painting. Representative works from this period include the oil paintings *Portrait of Poet Chen Sanyuan* (1927-1930), *Portrait of Mr. Xu Dazhang* (1928), *Portrait* (1928), *Portrait of Fu Zengxiang* (1935), and *Portrait of Sun Duozi* (1936). Among these, *Portrait of Poet Chen Sanyuan* (Figure 3) is Xu Beihong's most acclaimed portrait (Google Arts & Culture, n.d.). In terms of characterisation, the face is based on the precise anatomical structure, maintaining the rigorous control of "shape" unique to French academic painting. The whole work shows Xu Beihong's conscious exploration after returning to the country, combining the Western realistic modelling language with the spiritual expression of the Oriental literati portraiture.

Additionally, Xu Beihong's traditional Chinese figure paintings created in China before his 1939 trip to Nanyang, such as *Portrait of Huang Zhenzhi* (1930) (Figure 4), *Poor Woman* (1937), and *Flower Seller* (1938), further integrated Western perspective and anatomy into traditional Chinese figure painting techniques. *Portrait of Huang Zhenzhi* is a significant representative work from the second phase of Xu Beihong's reform efforts in Chinese painting (approximately 1925 to 1931). The primary characteristic of this painting is a return to tradition, marking a transitional stage towards his mature period (Hua, 2007). "The painting entirely employs traditional *gou-ran* (outline and wash) techniques, with no light and shadow on the face, the structure being completely rendered with brush lines. The drapery style shows the influence of Ren Bonian, and the painting methods for the pine, rock, bamboo, and chrysanthemum are all derived from tradition" (Hua, 2007). Although *Portrait of Huang Zhenzhi* has "no light and shadow on the face," unlike the significant chiaroscuro



Figure 2. Xu Beihong, *Portrait of an Old Woman*, 1922, 47 cm × 33cm. Oil on canvas, Source: (Xu Beihong Memorial Hall)



Figure 3. Xu Beihong, *Portrait of Poet Chen Sanyuan*, 1927-1930, 60 cm × 73 cm. Oil on canvas, Source: (Xu Beihong Memorial Hall)



Figure 4. Xu Beihong, *Portrait of Huang Zhenzhi* , 1930, 132 cm × 66 cm. Ink and color on paper. Source: (Xu Beihong Memorial Hall)

variations and more three-dimensional, realistic effects seen in the facial features of *Portrait of Rabindranath Tagore* (1940) and *Portrait of Li Yinquan* (1943), a detail of *Portrait of Huang Zhenzhi* (Figure 4) still shows that the rendering of the facial features accurately highlights the bones and muscles, achieve initial integration of Chinese and Western styles. As Xu Beihong said, "I went to Europe to study Western painting techniques in order to find methods to reform Chinese painting" (Yang, 2018).

Therefore, the portraits that he produced when he was in Singaporean can be examined by three formal characteristics: (a) His oil portraits often followed the chiaroscuro and volumetric modelling techniques of the French Academy, while his Chinese portraits maintained a Western/ Chinese technical dichotomy; (b) The

background of his paintings primarily served as documentary or atmospheric purposes, with little independent symbolic or narrative significance; and (c) The portrait painting was dominated by the personal relationship between the artist and the sitter, rather than by the commercial commission dynamics of the diaspora economy.

METHODS

This study adopts a qualitative research method, mainly combining archival analysis and Xu Beihong as the case study. This is useful for studying artworks created within a specific socio-economic context in art and art history studies. According to John W. Creswell (2018), archival research is a process of identifying, evaluating, and synthesising existing evidence to clarify facts and draw conclusions about historical events. In this study, the researcher conducted an extensive review of archival materials related to Xu Beihong's stay in Singapore from 1939 to 1942. The primary sources were historical newspapers housed in the National Library of Singapore, such as the *Nanyang Siang Pau* and the *Sin Chew Jit Poh*, which directly documented Xu Beihong's exhibitions, social engagements, and public reactions to his works in Singapore. Additionally, the researcher consulted exhibition catalogs, personal letters, and academic writings from his time in Singapore. By adhering to the principles of historical research, this method facilitates a systematic reconstruction of Xu Beihong's artistic practice in Singapore and the socio-cultural context surrounding his figure painting creations, providing a robust empirical foundation for subsequent analysis.

This study adopts a case study approach to conduct targeted, in-depth investigations. Yin (2018) defined case studies as empirical studies that explore contemporary phenomena in real-world settings, especially when the boundary between the phenomenon and its background is unclear. Although this study is a historical study, this definition also applies to the investigation of Xu Beihong's paintings, which can be seen as a "case" embedded in the specific background of Singapore before the war. Based on this, the paper selects representative figure paintings of this period for detailed analysis, including *Fishing in Winter* (1939), the *Portrait of Sir Shenton Whitelegge Thomas* (1939), *Put Down Your Whip* (1939), and so on. This tripartite analytical approach: visual, contextual, and comparative, enables the study to move beyond isolated formal appreciation toward an integrated understanding of how the patronage economy of Singapore shaped Xu's pictorial choices. By juxtaposing historical data ("what happened" and "when") with carefully read works ("how to present" and "why"), the dual approach of this study helps comprehensively explain how Xu Beihong's unique experience in Singapore catalysed the transformation of his portraiture.

RESULTS AND DISCUSSION

Xu Beihong's Portrait Paintings in Singapore

As mentioned earlier, Xu Beihong's portrait paintings in Singapore were mainly created

during his study in Europe and the period of China's full-scale Anti-Japanese War. During the early period, his creations paid more attention to meeting the commissioners' requirements, such as *Portrait of Tan Kah Kee* (1925) and *Portrait of Lim Loh* (1927). However, during World War II, he revisited Singapore out of his sense of mission to support the Anti-Japanese War and save the country.

In this period, Xu Beihong created portrait paintings in Singapore for various reasons, which can be divided into several situations: first, the portrait paintings of Xu Beihong's friends or wealthy overseas Chinese merchants were created for social needs, such as the oil paintings *Portrait of Mr. and Mrs. Ho Kwong Yew and Ho Kok Horng* (1939), *Portrait of Lim Hak Tai* (1939), *Portrait of Mother and Daughter* (1939) and *Portrait of Young Lady* (1940), and others; the sketches *Portrait of Huang Manshi* (1939), *Portrait of Huang Mengui* (1941), and others; and the Chinese paintings *Fishing in Winter* (1939), *Portrait of Lee Choon Seng* (1939). Second, Xu Beihong's commissioned portraits, such as *Portrait of Sir Shenton Whitelegge Thomas* (1939) and *Portrait of Miss Jenny* (1939). Third, there were portrait paintings that reflected the theme of the Anti-Japanese War, for example, *Put Down Your Whip* (1939).

From the beginning of 1939 to the beginning of 1942, China was in a critical period — the full-scale Anti-Japanese War, and it was also the most energetic period of Xu Beihong's creation (Singapore Art Museum, 2008). As scholar Au Yeung Hing Yee (1985b) pointed out, "Xu Beihong chose Singapore as a fundraising destination because he understood the economic development of Singapore. Here, the Chinese people are the most concentrated, and also the richest". During this period, Xu Beihong's activities in Singapore and his wide range of acquaintances had a deep and growing influence. Au Yeung Hing Yee (1999) emphasised the importance of Southeast Asia, in particular Singapore, to Xu Beihong: "Singapore is an important turning point in Xu Beihong's artistic life. Whenever he is in a situation of family and national difficulties, as soon as he comes to this small island in Southeast Asia, he will break through another world."

The Creative Shift in Xu Beihong's Portrait Paintings during His Singapore Years

In comparison with his early works, such as *Scattering Flowers (Portrait of Mei Lanfang)* (1918), *Portrait of an Old Woman* (1922), *Portrait of the Poet Chen Sanyuan* (1927-1930), and *Portrait of Huang Zhenzhi* (1930) as mentioned earlier, Xu Beihong's portrait paintings during his time in Singapore showed a significant change in his creative style, which is manifested in the following characteristics: a deepening of the integration of Chinese and Western artistic approaches, changes in background treatment, and strengthening of realism and transformation in Xu Beihong's signature.

Deepening of the Integration of Chinese and Western Art Artistic Approaches

Xu Beihong had devoted his whole life to the integration of Chinese and Western

techniques this could be seen as early as 1918, while serving as an instructor at the Painting Method Research Society at Peking University (established 1918), Xu Beihong's Modernization Movement of Chinese Painting (1918-1953)[3] when he advocated the incorporation of realistic techniques from Western painting into Chinese painting, with an emphasis to "integrate compatible Western approaches" (Zhu, 1986), as seen in Xu Beihong's Chinese painting, *Scattering Flowers* (Figure 1), the depiction of the figures' facial features and hands clearly demonstrates the influence of Western painting techniques.

This is reflected in the works of Xu Beihong during his time in Singapore, such as *Fishing in Winter* (Figure 9), which was painted for Singapore banker Tan Ean Kiam (1881-1943) in 1939, demonstrating his ability to combine Western realistic techniques with the elegance of Chinese ink painting. However, this stylistic choice cannot be attributed solely to Xu's internal artistic evolution; it must also be understood through the lens of the patronage economy in which the work was produced. Tan Ean Kiam was a conservative overseas Chinese banker, the "premier of the largest overseas Chinese financial institution of his time," and a "successful poet who achieved artistry effortlessly, without intentional striving" (Au Yeung, 1985d). In 1938, Tan Ean Kiam also published his own poetry collection, "Zhiyuan Poetry Collection." On March 21, 1939, Tan Ean Kiam visited the Singapore Chinese Chamber of Commerce to see Xu Beihong's fundraising art exhibition. He personally, and on behalf of the Wu Lu Club (of which Tan Ean Kiam was then chairman), donated funds to purchase Xu Beihong's works. Xu Beihong painted two colorful ink portraits for him. *Fishing in Winter* (Figure 9) is one of them. The theme of this painting highlights a lone fisherman in a snowy landscape, evoking the "hermit fisherman" tradition in literati painting. This imagery is imbued with connotations of moral purity and detachment from worldly corruption. According to Au Yeung, this painting was created by Xu Beihong at Tan Ean Kiam's request. Tan had asked Xu Beihong to paint a "Solitary fisherman on a cold river" depicting himself wearing a coir raincoat and a bamboo hat amidst heavy frost and snow. "A straw cape and hat are my family's style, life as bland as water. A lone boat in frost and snow, fishing alone in the cold river." — this poem by Tan Ean Kiam, inscribed on a painting, expresses his creative intent (Au Yeung, 1985d). Xu Beihong also explicitly stated in his inscription in the upper right corner of the painting that it was a commissioned work: "In the spring of April 1939, I was preparing for a fundraising exhibition in Singapore, and Mr. Tan Ean Kiam asked me to paint this picture." For a Nanyang *towkay* navigating the tumultuous socio-political environment of British Singapore, commissioning such a

[3] Xu Beihong's Chinese painting reform movement, first proposed in a 1918 lecture at Peking University's Painting Method Research Society. The core of his reform movement was to improve Chinese painting through Western realist techniques, addressing what he saw as a historical weakness in Chinese painting as it lacks the emphasis on anatomical accuracy.

painting was not merely an aesthetic choice; it was an affirmation of identity, a public assertion of Confucian moral standing through the symbolic capital of high culture.

In this painting, Xu Beihong used traditional Chinese painting materials to accurately depict the portrait features and personal interests of the protagonist, Tan Ean Kiam. Only the character's face and hands were rendered using Western realistic techniques, while the rest of the background was rendered using purely Chinese freehand *(xie yi)* landscape painting techniques. The environment of *Fishing in Winter* was created by depicting snow and branches beneath it, and the painting lacked the strategic void or *Liu Bai*, common in Chinese ink paintings. Instead, it resembled the style of Western oil paintings or watercolor portraits, unlike Xu Beihong's *Poor Woman* (1937) and *The Flower Seller* (1938) (Figure 5), which featured only the character without any background.

The characters are portrayed differently — while *Flower Seller* is a sketch of an anonymous street vendor created by Xu Beihong for teaching or exploratory purposes, *Winter Fishing* is a portrait commissioned for a specific client, requiring the fulfillment of their particular expectations. These two works belong to fundamentally different creative paradigms: one is a private study, the other a commercial commission. Their formal differences, therefore, not only reflect the "evolution" of Xu Beihong's spatial thinking but also embody the unique pressures and advantages inherent in different patronage contexts.



Figure 5. Xu Beihong, *The Flower Seller,* 1938; 101.5 cm × 62 cm. Ink and colour on paper. (Source: Artron. Net, https://m-news.artron.net/20201222/n885487.html)

In addition, although the faces of the characters in *The Flower Seller* are depicted using Western realistic techniques to show changes in light and shade through the use of thick and thin ink, the difference from the faces of the characters in *Fishing in Winter* remains evident. The facial modelling of the characters in *Fishing in Winter* is more exquisite and three-dimensional because "Xu Beihong, referring to real people and photos, first drafted with a pencil (Figure 6), then sketched with a brush, dried with light ink, drew a small portrait from life, and then enlarged to a large rice paper" (Au Yeung, 1985d). This painting may reflect the



Figure 6. Xu Beihong, Portrait of Lee Choon Seng and Tan Ean Kiam (Creative Sketch), 1939; Sketch. (Source: BEIHONG ZAI XINGZHOU, 2020)

elite sponsors' higher requirements for the completion of commissioned works, which contrasts with the more casual and sketchy approach in street scenes.

Changes in Background Treatment

Wu Zuoren (1908-1997) emphasised the "dual nature" of these backgrounds in Xu Beihong's work—functional and symbolic. Wu Zuoren discussed how the functional background mainly serves the purposes of space and narration and constructs physical space and supports the continuity of the picture through common techniques in Western realistic painting, such as perspective logic and light-and-shadow organisation. In contrast, symbolic backgrounds are understood as conveying emotional or spiritual realms, externalising inner states through ink brushwork and the expressive potential of Chinese painting.

Wu Zuoren also compared and analysed Eastern and Western perspectives on backgrounds, Western painting backgrounds create space, while Chinese painting backgrounds depict the state of mind (Wu, 1979). Western painting backgrounds create space, refers to the background treatment of Western painting that is not strictly based on reality, but is added, subtracted, or even "created" according to the theme of the picture. The *Portrait of Lim Loh* (1927) *and Portrait of Sir Shenton Whitelegge Thomas* (1939) belongs to the first category, where Xu Beihong "created" according to the needs of the picture.

Xu Beihong's *Portrait of Sir Shenton Whitelegge Thomas* (Figure 7) was initiated at the end of June 1939. The oil painting *Portrait of Sir Shenton Whitelegge Thomas,* completed and unveiled in mid-September, garnered far more attention than the portraits of previous governors on display at Singapore's Victoria Memorial Hall. Representing Chinese-language newspapers, *Nanyang Siang Pau* and *Sin Chew Daily* published six news articles on the painting. In contrast, English-language newspapers, such as *The Straits Times*, also featured six reports. After the portrait was completed, Sir Thomas, Governor of the Straits Settlements, wrote to Xu Beihong on September 14, praising the portrait as "an exquisitely crafted masterpiece." (Lawyer Chen Siren, on behalf of the



Figure 7. Xu Beihong, *Portrait of Sir Shenton Whitelegge Thomas*, 1939; 244.5 cm × 134cm. Oil on canvas. (Source: National Museum of Singapore)

overseas Chinese community, presented the Governor's portrait to the Mayor, 1939).

This commission by the British High Commissioner and the artist represents a complex field in the dynamics of postcolonial power. The portrait's background is meticulously constructed to reflect Governor Thomas's official status and unique colonial context. The backdrop to the right of the *portrait of Sir Shenton Whitelegge Thomas* features a large British classical stone pillar. Conversely, on the left side, the governor rests against a Chinese rosewood tea table adorned with inlaid mother-of-pearl. Surrounding the base of the stone pillar are lush tropical green plants. In the background behind the governor, the outlines of banana and coconut trees are subtly visible. Clearly, the background of this scene was not the actual view from Xu Beihong's studio in Jiangxia Tang. Still, it was deliberately arranged by Xu Beihong to reflect the governor's special status. On this point, scholar Au Yeung (1985c) also expressed the same view,

> *Many people criticise that these two types of Chinese and Western props (i.e., English stone pillar and Chinese rosewood tea table) should not be placed together in the same painting. But it is precisely the choice of these two incompatible environmental props that places the Governor of the Straits Settlements in a typical mixed environment of Chinese and Western cultures, thereby expressing his identity.*

The public reception of this painting also revealed this dual scrutiny. Governor Thomas, from a colonial perspective, acknowledged and praised the painting as a "masterful masterpiece" (Lawyer Chen Siren, on behalf of the overseas Chinese community, presented the Governor's portrait to the Mayor, 1939). On the other hand, local Chinese media, such as the September 15th report in *Nanyang Siang Pau*, focused on the prestige the painting's artistic achievement brought to the Chinese community. As

Governor Thomas emphasised in his thank-you letter to Dr. Lim Han Ho, the Chinese community representative and initiator of the governor's portrait commission, "The joy of this friendly connection with the Chinese community in Singapore is boundless. The work of this portrait is indeed excellent, and I believe the people of your country will undoubtedly agree." (Lawyer Chen Siren, on behalf of the overseas Chinese community, presented the Governor's portrait to the Mayor, 1939).

Furthermore, this portrait was sold for 4,000 national currency units, which was a huge sum at the time (converted at an exchange rate of 8:1, 4,000 national currency units equaled 500 Straits dollars in Singapore)[4]. It must be noted that Singapore painter Chen Chong Swee's salary as an art teacher at Tuan Mong High School[5], was 60 Straits dollars at the time. Therefore, Xu Beihong's painting, sold for 500 Straits dollars, was almost equivalent to Chen Chong Swee's salary for nearly a year as an art teacher. This comparison not only highlights its artistic value but also underscores its worth as a cultural and political commodity within the prevailing socio-economic context of Singapore in 1939.



Figure 8. Xu Beihong, *Portrait of Lim Loh,* 1927; 116 cm × 77 cm. Oil on canvas. (Source: National Gallery of Singapore)

The *Portrait of Lim Loh* (Figure 8) reflects Xu Beihong's portrayal of the characters' inner spirit, combining Western realistic techniques with Eastern aesthetic concepts. In the painting, the main character stands almost entirely in the foreground, wearing exquisite Chinese attire and holding a hand fan that symbolises Chinese intellectuals. The fan depicts chrysanthemums, a traditional Chinese painting theme. Xu Beihong used this method to honor Lim Loh as one of Singapore's pioneers, while also praising

[4] The exchange rate was from Li Chao and Liu Kanglin's "Research on Artistic Documents from Liu Haisu's 'Nanyang Period'" published in *Meishu*, Issue 1, 2022, page 83. It should be noted that this exchange rate is based on the 1941 rate; however, given the short interval between the two periods, it is unlikely that the exchange rate differed significantly.

[5] Letter of appointment from Tuan Mong High School, Singapore, to Chen Chong Swee in 1939, held by the National Gallery Singapore, Collection ID (Reference Code): RC-SG04-CCS.03-0006.

his noble character. The chrysanthemum symbolises noble character and purity, so it has become a commonly used subject in ink painting.

In these two portrait paintings, Xu Beihong meticulously depicts the environment behind the characters to reflect their identities. This feature can be classified as a "functional" background, thereby aligning with the public function of portraiture and the readability of identity. In *Portrait of Sir Shenton Whitelegge Thomas*, the use of English marble columns, a redwood table inlaid with mother-of-pearl, and tropical plants highlights the unique cultural and geographical environment of the governor's office in Southeast Asia. In contrast, the background of *Portrait of Lim Loh* features high mountains, lakes, and pine trees, with orchids in the mountains, symbolising the figure's noble character.

> *Representing the official identity of the subject is an inherent requirement of Xu Beihong's realist portraiture. This is evident in several portraits he completed for distinguished friends in Nanyang, where he would, depending on the circumstances, supplement the depiction with props, complement it with the environment, imply relationships, and convey meaning through perspective, using various appropriate methods to present the social aspect of the subject* (Cao, 2020).

The second characteristic — expressing inner state through the background of Chinese painting (Wu, 1979) — can be seen in how he creates a background that enhances and reflects the inner emotions or mental state of the characters in the painting. This transcends the limitations of physical space, achieving an aesthetic isomorphism between the "scenery" and the "inner state". Xu (2009), in his lectures at Central University, has emphasised that the background is not a realistic portrayal of the scene, but rather an externalisation of the inner landscape. As mentioned earlier, *Fishing in Winter* (Figure 9) and *Portrait of Lee Choon Seng* (Figure 10) use the background to reflect the characters' inner states, as evidenced by the symbolic background.

Xu Beihong's *Portrait of Lee Choon Seng* and *Fishing in Winter* are among the few Chinese portrait paintings he has created in Singapore. The figures are not only realistic portraits with accurate forms and harmonious proportions, but, more importantly, Xu Beihong uses the *xieyi* (freehand) style of ink painting to create atmosphere in the background, highlighting the subjects' lofty aspirations through a fusion of Chinese and Western artistic techniques, for example, in *Portrait of Lee Choon Seng*. In the painting, Lee Choon Seng (1888-1966), the chairman of the Singapore Buddhist Lodge, is depicted wearing a *kasaya*, set against a background of pine trees, rocks, and flowing water, expressing his religious beliefs. The *Portrait of Lee Choon Seng* was commissioned by Lee Choon Seng himself, and Xu Beihong created it in accordance with his wishes (Au Yeung, 1985d).



Figure 9. Xu Beihong, *Fishing in Winter,* 1939; 75.8 cm × 119.5 cm. Ink and colour on paper. (Source: *Bei Hong Zai Xing Zhou*, 2020)

As previously mentioned, the *Portraits Fishing in Winter* (1939) and *Portrait of Lee Choon Seng* (1939) were created to meet the patrons' wishes, resulting in a slightly different visual effect from the earlier *Portrait of Huang Zhenzhi* (1930). The background treatment in *Fishing in Winter* (1939) and *Portrait of Lee Choon Seng* (1939) integrates traditional Chinese painting techniques with Western realist expressive skills. The backgrounds of these two portraits are not actual scenes from Nanyang, Singapore, but rather fictional settings designed to highlight the subjects' spiritual character, demonstrating the successful negotiation between the artist and the patrons.



Figure 10. Xu Beihong, *Portrait of Lee Choon Seng,* 1939. Ink and colour on paper. (Source: Hua Tianxue: Study on Several Newly Discovered Figure Illustrations by Xu Beihong, *Fine Ar*t, 2023)

The Intensification of Realism

Among Xu Beihong's portrait works in Singapore, *Put Down Your Whip* (Figure 11), created in 1939 reflects his concern for social reality and his support for

the Anti-Japanese War. This spirit of realism was already reflected in several of his early works, but it was further strengthened in the Singapore period. Scholar Shang Hui (2021) believes that during the critical period of the formation of Xu Beihong's unique style in oil painting, he was undergoing a profound transformation from representational realism (as an artistic technique) to critical realism (as a creative methodology). After Xu Beihong returned from his studies in France in 1927, he immediately began to prepare for the creation of large-scale historical paintings, namely *Tianheng Five Hundred Soldiers* and *Xi Wo Hou (Awaiting Deliverance)*. However, as time progressed, his French Academic art style gradually waned, with grand historical paintings yielding to mythological and legendary themes that offered more potent allegorical references to social realities. This transition is evidenced by unfinished historical compositions such as *Farewell My Concubine* and *Qin Qiong Selling His Horse*, which survive solely as partial sketch studies. Sullivan (1996) wrote,

> *After 1933, Hsu Pei-hung (Xu Beihong) abandoned the grand historical narrative and favored the legendary theme with social implications, which is particularly obvious in his unfinished sketches, in which symbolic deformation exceeded the accuracy of the academic school.*

Xu Beihong's *The Foolish Old Man Moves Mountains,* completed in India in 1940, has a more explicitly realistic orientation than *Xi Wo Hou (Awaiting Deliverance)* and *Tianheng Five Hundred Soldiers*. That is, through the visual presentation of the fable of Yu Gong moving mountains to show the determination and firm belief of the Chinese people in the Anti-Japanese War (Shang, 2021). Zhang and Tang (2024) argue that "As the circumstances of the War of Resistance changed, Xu Beihong's artistic focus shifted from an individual perspective to a national one, his attention moved from 'heroes' to 'the people', and his pictorial narratives also transformed". After 1935, Xu Beihong began to depict reality and gradually



Figure 11. Xu Beihong, *Put Down Your Whip,* 1939; 144 cm × 90 cm, Oil on Canvas. (Source: *Xu Beihong in Nanyang*, 2008, Cover)

recognised the significant power of the masses, reflecting a realistic consideration aimed at national salvation in his artistic creations (Zhang & Tang, 2024).

Xu Beihong's painting *Put Down Your Whip* (1939)[6] vividly embodies the growing trend towards realism, which is not merely a technique but a means of cross-media translation and social engagement. However, Xu Beihong himself did not watch the troupe performance of Put Down Your Whip; instead, he created the work based on performance stills and a live sketch of actress Wang Ying (Yeo, 2019). This creative process may be conceived as a cross-media translation, in which meanings and visual forms were continuously transformed across different media and social contexts – from itinerant street performance, to studio photography, to high-art bourgeois painting, and finally to the generation of wartime relief capital. By separating the performance from its street context and relying on studio-based characterisation, Xu Beihong effectively deepens a vivid proletarian street performance, turning it into a long-standing bourgeois salon painting. His focus was on portraying Wang Ying as a "universally admired heroine," making the entire work lean more towards poster-style mass communication, in hopes of resonating with wealthy patrons and mobilising their financial support.

Xu Beihong deliberately extracted the "street" elements from street theater to make his paintings visually acceptable to wealthy bourgeois donors and to contribute to the war effort when purchased at the chamber of commerce. He retained the dramatic postures but consciously altered elements, for example, changing Wang Ying's costume pattern to a "phoenix-and-peony design", symbolising her noble status and identity, thereby elevating her image beyond a specific role to that of a national heroine. This transformation reflects a consistent romantic characteristic in Xu Beihong's creative approach, which re-envisioned the direct, heartfelt impact of street theater as an inspiring, aesthetically refined high-art image. Consequently, the creative essence of this painting evolved from a common portrait of a film star to an outstanding depiction of a national heroine saving the country in that era (Cao, 2020).

This bourgeois aestheticisation stands in stark contrast to Situ Qiao's (1902-1958) 1940 oil painting on canvas of the same theme (Figure 12). Situ Qiao watched the performance of "Put Down Your Whip" multiple times. Shen Shan, the art director of the New China Theater Troupe at the time, later recalled that when the troupe performed "Put Down Your Whip" in Singapore, Situ Qiao was always seen nervously waving his paintbrush in the

[6] In a letter dated mid-November 1939 to a friend (written on a postcard bearing this portrait), Xu Beihong stated: "'Miss Wang Ying in Put Down Your Whip,' this painting is life-sized." Based on written evidence, professor Cao Qinghui at the Central Academy of Fine Arts uses "*Miss Wang Ying in Put Down Your Whip*" as the title for this work in his research (Cao, 2020). Other scholars also uses the title *"Put Down Your Whip -- Portrait of Wang Ying"* as the painting's title, emphasizing on Xu Beihong's portrait approach in painting *Put Down Your Whip* (1939) (Au Yeung, 2020).



Figure 12. Si Tuqiao, *Put Down Your Whip,* 1940; 124 cm ×177 cm, Oil on Canvas. (Source: National Art Museum of China, https://www.namoc.cn/xwzx/zt/stqstj/)

dark audience, trying to capture the most exciting scenes on stage. At the same time, his wife held a small lamp beside him to provide light (Shen, 1945). To paint the story of "Put Down Your Whip," Situ Qiao even specially invited Wang Ying and Zhao Xun to his studio, where their costumes, makeup, and lighting were identical to those on stage (Yeo, 2019). Starting from the original plot and characters of the street play, Situ Qiao created a narrative mode closer to a stage photograph, meticulously preserving the spatial claustrophobia of the street theater crowd and the raw proletarian suffering. Shen Shan believed that Situ Qiao understood and grasped reality; his portrayal of Xiangjie (Wang Ying) was that of a pitiful, vulnerable woman who had wandered for many years, unlike those "self-admiring literati" who tried to paint her as a celestial being (Shen, 1945). Yeo Mang Thong believes that the "self-admiring literati" refers to Xu Beihong (Yeo, 2019). This kind of "same theme, different structure" not only highlights the differences in the painters' creative motives and techniques, but also reflects the social environment in which they were based at the time and their attitudes towards saving the nation in response to the times.

Transformation in Xu Beihong's Artistic Signatures

Xu Beihong's evolving signatures on oil paintings (Figure 13) created during his time in Singapore (1925-1941) vividly reflected the transformation of his artistic identity and cultural stance. *Portrait of Lim Loh* (1927), signed horizontally in French as "PÉON 1927", demonstrated his adherence to European artistic norms during his studies in Paris. At this stage, Xu had not yet completed his education, and his many artworks were exhibited at the French



Figure 13. From left to right, *the portrait paintings of Lim Loh* (1927)*, Portrait of Sir Shenton Whitelegge Thomas* (1939), *Portrait of Mrs. Tchang Ju Chi and daughter* (1939), *Put Down Your Whip* (1939), and *Portrait of a Young Lady* (1940) are signed and dated by Xu Beihong

Spring Salon and received unanimous praise, which reinforced his inclination to present himself as an international artist. By contrast, *Portrait of Sir Shenton Whitelegge Thomas* (1939) marked a radical shift: Xu Beihong challenged the longstanding tradition of employing European artists to create portraits of colonial governors during Singapore's over-century-long colonial era (Au Yeung, 1985c). The work sold for 4,000 Chinese yuan, a record price for a living Chinese artist at the time (Zhang, 2016). Xu Beihong used the signature "悲鸿 乙卯六月" (Beihong, June of *Yi Mao*), combining Chinese characters with the traditional celestial-terrestrial calendar, signaling Xu's transition from a European-trained painter to a national artist.

In terms of how he signed his paintings, the *Portrait of Mrs. Tchang Ju Chi and daughter*, signed "悲鸿，廿八年八月" (Beihong, August 1939), introduced a horizontal Chinese signature paired with the Republican calendar. *Put Down Your Whip* further advanced this evolution with a vertical right-to-left inscription: "人人敬慕之女杰王莹，廿八年十月悲鸿写，星洲" (Wang Ying, a heroine admired by all, October 1939, Painted by Beihong in Singapore). By 1940, *Portrait of a Young Lady* had fully integrated Chinese artistic conventions: a vertical right-to-left inscription concluded with a vermilion "Xu" seal, while black oil paint simulated ink-wash texturing techniques (Shang, 2021). This confirms Xu Beihong's artistic proposition of integrating Chinese and Western painting styles.

This transformation was deeply tied to wartime cultural dynamics. In a June 30, 1939, letter to Shu Xincheng (1893-1960), Xu Beihong emphasised that the governor's portrait "marked the first time a Chinese artist broke colonial conventions" (Zhang, 2016). The shift from French to Chinese signatures, Gregorian to traditional or Republican dating systems, and horizontal to vertical layouts collectively embodied a cultural reorientation from "Eurocentrism" to "national subjectivity."

CONCLUSION

This study examines the stylistic changes in Xu Beihong's portrait paintings during a critical period in Singapore (1939-1942). Through archival research and case studies of key works, it is evident that this period marked a significant change in his artistic practice. During his stay in Singapore, he created many portraits of celebrities and wealthy businesspeople. His works are lifelike in both form and spirit (Xie, 1998). Xu Beihong's portrait art centers on realism, while taking into account the Oriental aesthetic tradition of both form and spirit. His creation has had a profound impact on the development of portraiture, both in depicting the characters' real appearance and in conveying the theme's profound significance.

Back to the core question of this study: is Xu Beihong's stylistic innovation derived from internal artistic evolution, or from patron-driven aesthetic obedience in the sponsorship economy? The evidence shows a dual mechanism with different weights across different types of entrustments. For the portraits of businesspeople such as Tan Ean Kiam and Lee Choon Seng, commissioners' expectations play a leading role in media selection (such as Chinese painting), and the theme (fisherman hermit, Buddhist monk) and the symbolic background are based on the commissioners' negotiations and requests. In contrast, in the portraits *of Sir Shenton Whitelegge Thomas* and *Put Down Your Whip*, Xu Beihong's artistic evolution and strategic negotiation with commissioners are more evenly integrated, aiming to reflect colonial prestige and attract the conscious visual choice of Chinese donors. The transformation from a French signature to a Chinese signature with a cinnabar seal further promotes the dual-driven model that responds to Xu Beihong's cultural self-assertion and meets Nanyang's customers' expectations for visible "Chineseness". Therefore, Singapore's patronage economy is not seen as a restriction but as a catalyst that contributed to the stylistic achievements that Xu Beihong's independent creation may not have achieved.

Through the in-depth study of Xu Beihong's portraits in Singapore, we can draw the following conclusions: first, Xu Beihong's artistic styles have changed significantly – the portraits that he produced in Singapore demonstrated his innovative techniques and styles, reflecting the characteristics of the integration of Chinese and Western cultures and diversified development. Secondly, Xu Beihong's artistic creation is influenced by many factors, such as the social environment, geographical conditions, and personal experience. Through the visual analysis above, it can be observed how Xu Beihong's portraits in Singapore are relatively mature and diverse. He successfully integrated Chinese and Western art, reaching new heights in the fusion of emotional expression and realism.

The significance of this study is reflected in two aspects. First of all, the focus on Xu Beihong's Singapore period is a key episode and a catalyst for his artistic development, challenging the traditional idea of holistic creation by

emphasising the interaction between his unique "Nanyang" characteristics and Singapore's local environment. Secondly, this study reveals how the life experiences of the overseas Chinese in Southeast Asia provide fertile ground for Xu Beihong's artistic innovation. This study emphasises the complex interactions among patriotism, cultural identity, and artistic adjustment, and offers a subtler perspective on the modernisation of Chinese art in the 20th century.

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REFERENCES

Au Yeung, H. Y. (1985a, September 18). Studying in Paris and making connections in Singapore. *Lian He Wan Bao*, p. 17. https://eresources.nlb.gov.sg/newspapers/digitised/article/lhwb19850918-1.2.37.1.1

Au Yeung, H. Y. (1985b, September 20). An art event forty-six years ago—The Xu Beihong exhibition in 1939. *Lian He Wan Bao*, p. 20. https://eresources.nlb.gov.sg/newspapers/digitised/article/lhwb19850920-1.2.40.1.1

Au Yeung, H. Y. (1985c, September 23). Portrait of the governor and the dancer. *Lian He Wan Bao*, p. 14. https://eresources.nlb.gov.sg/newspapers/digitised/article/lhwb19850923-1.2.32.1.1

Au Yeung, H. Y. (1985d, September 25). The recovered painting of Fishing on the Cold River. *Lian He Wan Bao*, p. 13. https://eresources.nlb.gov.sg/newspapers/digitised/article/lhwb19850925-1.2.32.1.1

Au Yeung, H. Y. (1999). *Beihong zai Xing Zhou* [Beihong in Sin Chew]. Singapore Art Museum.

Auyeung, H. Y. (2008). Serendipitous times for the historical study of Xu Beihong. In S. Low & Y. Chow (Eds.), *Xu Beihong in Nanyang* (pp. 73-77). Singapore Art Museum.

Au Yeung, H. Y. (2020). *Beihong zai Xing Zhou* [Beihong in Sin Chew]. People's Fine Arts Publishing House.

Baxandall, M. (1988). *Painting and experience in fifteenth-century Italy: A primer in the social history of pictorial style*. Oxford University Press.

Bourdieu, P. (1993). *The field of cultural production: Essays on art and literature*. Columbia University Press.

Cao, Q. H. (2020). A restudy of Xu Beihong's *Miss Wang Ying in Put Down Your Whip*: Understanding and discussion based on situational practice and image archaeology. *Literature and Art Studies, 10*, 115-134.

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications.

Google Arts & Culture. (n.d.). *Portrait of the poet Chen Sanyuan — Xu Beihong (Xu Beihong)*. https://artsandculture.google.com/asset/%E8%AF%97%E4%BA%BA%E9%99%88%E6%95%A3%E5%8E%9F-%E5%BE%90%E6%82%B2%E9%B8%BF/SQE8kKcxjYAjVA?hl=en

Hua, T. X. (2007). *Xu Beihong's reform of Chinese painting*. Shanghai Calligraphy and Painting Publishing House.

Hua, T. X. (2023). Study on several newly discovered figure illustrations by Xu Beihong. *Fine Arts,*

672(12), 70-80. https://doi.org/10.13864/j.cnki.cn11-1311/j.007266

Lawyer Chen Siren, on behalf of the overseas Chinese community, presented the Governor's portrait to the Mayor. Lawyer Chen expressed the respect of the overseas Chinese for the Governor. The Governor wrote a letter to Xu Beihong, praising his masterpiece. (1939, September 15). *Nanyang Siang Pau*, p. 6. https://eresources.nlb.gov.sg/newspapers/digitised/article/nysp19390915-1.2.46

Li, M. M. (1990, March 24). A retrospective exhibition of Xu Beihong's art in the past fifty years. *Lianhe Zaobao*, p. 51. https://eresources.nlb.gov.sg/newspapers/digitised/article/lhzb19900324-1.2.73.1.1

Liu, D. S. (2021). Nanyang characteristics of Xu Beihong's paintings: A further study of Sir Shenton Thomas. *Chinese Oil Painting*, (4), 77-78.

Liu, S. Z., & Liu, L. (2018). A study of Xu Beihong's portrait art in Chinese painting. *Art Journal*, (3), 115-121.

Renowned painter Xu Beihong arrived in Singapore yesterday and will exhibit a thousand masterpieces. (1939, January 10). *Sin Chew Jit Poh*, p. 9. https://eresources.nlb.gov.sg/newspapers/digitised/article/scjp19390110-1.2.18.3

Shao, X. F. (2018). The "Xu Beihong themed creative exhibition" and Xu Beihong's trip to Nanyang. *Chinese Calligraphy and Painting*, (3), 90.

Shang, H. (2021). The self and the other: The localization process of Xu Beihong's oil painting in turbulence (1927-1941). *Art*, (12), 86-93. https://doi.org/10.13864/j.cnki.cn11-1311/j.006606

Shen, S. (1945, November 5). The "Put Down Your Whip" in the painter's brush: A record of Mr. Situ Qiao's "Throwing the Whip". *Xinmin Bao*.

Singapore Art Museum. (2008). *Xu Beihong zai Nanyang* [Xu Beihong in Nanyang].

Sullivan, M. (1996). *Chinese art in the 20th century*. University of California Press.

The Governor and military and political officials today visited Xu Beihong Art Exhibition. (1939, March 14). *Sin Chew Jit Poh*, p. 9. https://eresources.nlb.gov.sg/newspapers/digitised/article/scjp19390314-1.2.19.3

Wang, S. X. (2024). The pictorial function of Xu Beihong's portraits and the modern transformation of the Confucian spirit. *Western Literary and Art Studies*, (2), 134-140.

Wang, Z. (2006). *Xu Beihong nian pu chang bian* [Xu Beihong Chronicle]. Shanghai Art Newspaper Publishing House.

Wu, Z. R. (1979). A casual discussion of sketching and painting. *Art Research*, (3), 8–15.

Wang, Z. (1991). *Xu Beihong Yan Jiu* [A Study of Xu Beihong], Jiangsu Fine Arts Publishing House.

Xie, X. (1998, June 25). Watching "Galloping Horse" and thinking of Xu Beihong. *Xin Ming Ri Bao*, p. 8. https://eresources.nlb.gov.sg/newspapers/digitised/article/shinmin19980625-1.2.7.25

Xu, B. H. (2009). Similarities and differences between Chinese and foreign art (J.-W. Zhang, Ed.). In *Xubeihong Tanyilu* (pp. 57-72). Hunan University Press.

Xu, F. F. (2020). Remembering my father Xu Beihong—Commemorating the 125th anniversary of Xu Beihong's birthday. *Art Research*, (4), 77-80. https://doi.org/10.13318/j.cnki.msyj.2020.04.012

Yang, X. R. (2018). *Xu Beihong*. Guangxi Normal University Press.

Yeo, M. T. (2019). *Collected essays on Singapore art history 1886-1945*. Zhejiang People's Fine Arts Publishing House.

Yin, R. K. (2018). *Case study research and applications: Design and methods* (6th ed.). Sage Publications.

Zhang, M. X. (2016). Exile and relief: The journeys of Xu Beihong in Nanyang and India, as revealed in the letters in the collection of the Chinese Book Company. *Chinese Calligraphy*, *289*(9), 4-31.

Zhang, P., & Tang, Y. P. (2024). From “heroes” to “people”: Xu Beihong's artistic transformation as a modern intellectual during the Anti-Japanese War period. *Chinese Art*, (4), 19-28.

Zhu, D. (1986). The thoughts and art of Xu Beihong. In Z. Wang (Ed.), *Xu Beihong collection* (p. 23). Lijiang Publishing House.

Zong, S. (1939, March 15). Professor Xu Beihong's exhibition and other things. *Sin Chew Jit Poh*, p. 9. https://eresources.nlb.gov.sg/newspapers/digitised/article/scjp19390315-1.2.19.4

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From Concept to Instrument: 10 Steps in Developing a Questionnaire for Art and Cultural Tourism Studies

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ABSTRACT

Developing robust research instruments is essential for advancing studies in art and cultural tourism, particularly in multidisciplinary community settings. This study aimed to develop a context-specific questionnaire to assess how art and cultural tourism initiatives contribute to sustainable income generation among senior citizen centres in Malaysia. A systematic 10-step questionnaire development framework was employed, integrating the Triple Bottom Line (TBL) framework, the Socio-Ecological Model (SEM), literature review, expert validation, bilingual adaptation, and pilot testing. The pilot study demonstrated excellent internal consistency, with Cronbach's alpha values ranging from 0.898 to 0.967 and an overall reliability coefficient of 0.977, providing preliminary evidence of the instrument's reliability. By documenting each stage of questionnaire development, the proposed framework enhances methodological transparency and offers a practical, replicable approach for researchers developing context-specific instruments in tourism, gerontology, and sustainable community development. Future studies should further establish the instrument's construct validity through large-scale psychometric validation involving the intended target population.

Keywords: Art and cultural tourism, economic empowerment, gerontology, questionnaire development, senior citizen centres, sustainable income generation

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INTRODUCTION

As Malaysia is currently moving towards an ageing population, there are a few difficulties for senior citizen centres, and one of the difficulties is how to sustain existing financial resources when traditional funding

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methods are not enough to fulfil elderly communities with higher demands, which shows that more innovative approaches are vital to having sustainable income sources. One way to tackle the issue is by developing different initiatives for art and cultural tourism, and they are increasingly seen as solutions that could help provide more opportunities for cultural preservation, income generation, and social engagement. To see whether the initiatives are actually effective, scholars need to have a questionnaire that is carefully developed and can accurately capture different aspects, such as social, economic, and environmental.

Although numerous validated questionnaires have been developed in tourism, sustainability, and gerontology research, most focus on measuring individual constructs rather than the multidimensional factors influencing sustainable income generation through art and cultural tourism in senior citizen centres. In addition, existing studies provide limited guidance on developing context-specific instruments that integrate multidisciplinary theoretical perspectives within a transparent and systematic development process. To address this gap, the present study proposes a systematic 10-step questionnaire development framework that integrates the Triple Bottom Line (TBL) and Socio-Ecological Model (SEM), supported by literature-based item development, bilingual adaptation, expert validation, and pilot testing. By documenting each stage of instrument development, this study enhances methodological transparency and provides a practical, replicable framework for future research in art and cultural tourism.

LITERATURE REVIEW

The triple bottom line (TBL) framework and the socio-ecological model (SEM) were referred to when performing a review on past studies, and both theories were also used to observe how art and cultural tourism initiatives could aid in sustainable income generation among senior citizen communities. On the other hand, the economic, social, and environmental aspects of the TBL framework are consistent with different results related to cultural-tourism activities. On the other hand, the SEM helps categorise the results across individual, interpersonal, organisational, community, and policy levels, allowing for examining both the effects and contextual enablers of cultural-tourism activities. Despite there being some economic and social benefits of cultural tourism for communities, as shown by previous scholars, only some researchers have integrated both the TBL framework and SEM in systematic ways, seeking to evaluate how income can be generated in sustainable ways among senior citizen communities, and the gap would be resolved in the present study through the investigation of outcome areas and the multi-level mechanisms that could support different income sources through art and cultural tourism activities in the long term.

RESEARCH CONTEXT

As part of a larger research project entitled *An Integrated Model of Sustainable Income*

Generation for Gerontological Communities through Art and Cultural Tourism Initiatives, this study aimed to develop a questionnaire for collecting data from administrators and staff responsible for planning and managing art and cultural tourism programmes at senior citizen centres in Malaysia. Their perspectives are essential for understanding how social, economic, and environmental factors contribute to sustainable income generation through art and cultural tourism initiatives. Although the project title uses the term *gerontological communities*, the present study consistently uses *senior citizen centres* to refer to the organisations that provide programmes and services for older adults, as these centres represent the intended unit of analysis and target population.

Ageing and the Role of Senior Citizen Centres in Malaysia

With the proportion of Malaysians aged 60 years and above projected to reach approximately 23% by 2050, the country is rapidly transitioning towards an ageing society, creating significant challenges for social protection, healthcare services, and income security, particularly for senior citizen centres that provide day-to-day support for older adults (Department of Statistics Malaysia, 2025). Traditionally, these centres have relied on government funding, charitable donations, and community contributions. However, these sources are becoming increasingly insufficient to ensure long-term financial sustainability and the continued delivery of holistic programmes (Phillipson, 2013). Consequently, innovative and sustainable income-generating strategies are required, including partnerships with cultural organisations and participation in art and cultural tourism initiatives to strengthen community resilience.

Participation in art and cultural tourism has also been associated with healthy ageing by promoting active lifestyles, social connectedness, cognitive stimulation, and psychological well-being among older adults. The World Health Organization (WHO) recognises that meaningful social participation and age-friendly community environments are fundamental to healthy ageing, while evidence from a WHO scoping review demonstrates that engagement in arts and cultural activities contributes to improved physical and mental health, reduced social isolation, and enhanced quality of life across the lifespan (Fancourt & Finn, 2019; World Health Organization, 2021). These findings reinforce the role of senior citizen centres as platforms for social participation, cultural preservation, and sustainable community development.

Art and Cultural Tourism as a Driver of Economic Empowerment

To empower society and the economy, it seems art and cultural tourism can become powerful tools for community members by generating more income and fostering efforts to preserve local cultures through interactions among different generations. Some initiatives or programmes, such as traditional performances, handicraft markets, cultural festivals, and heritage exhibitions, could be organised to provide

senior citizens with the opportunities to contribute knowledge and skills and generate more value for local tourists and also visitors from other countries (Buhalis et al., 2023). There are some success cases, such as in Japan, where senior citizens are actively involved in cultural tourism initiatives that are organised by the Silver Human Resource Centres (Nogales-Muriel et al., 2024).

With its rich cultural diversity, Malaysia has strong potential to adopt similar community-based art and cultural tourism initiatives that empower senior citizens as active contributors rather than passive beneficiaries, supporting sustainable development through economic empowerment, cultural continuity, and community participation (Balqis-Ali & Fun, 2024). Heritage destinations such as George Town, Penang, and Melaka UNESCO World Heritage Sites provide opportunities for older adults to contribute their traditional knowledge and skills through handicrafts, storytelling, traditional cuisine, and cultural performances. These initiatives help preserve cultural heritage while promoting intergenerational knowledge transfer, community participation, and sustainable income generation for senior citizen centres (Abdul Rasid et al., 2013; UNESCO World Heritage Centre, 2024).

Theoretical Models for Sustainable Development: TBL and SEM

To guide the development of the questionnaire, this study integrates two complementary theoretical frameworks, the Triple Bottom Line (TBL) framework and the Socio-Ecological Model (SEM). The TBL framework emphasises three sustainability dimensions which are social, economic, and environmental, which provide a holistic basis for assessing the sustainability of art and cultural tourism initiatives (Elkington, 1997). Complementing this perspective, the SEM explains how individual, interpersonal, organisational, and community-level factors influence behaviour and programme outcomes (Bronfenbrenner, 1979). Within the context of senior citizen centres, these frameworks provide a comprehensive theoretical foundation for understanding how community participation, organisational capacity, environmental stewardship, and economic activities contribute to sustainable income generation.

Guided by these frameworks, the questionnaire constructs were developed by aligning the sustainability dimensions of the TBL framework with the multiple levels of influence proposed by the SEM. Social Engagement reflects the social dimension of TBL and the interpersonal and community levels of SEM through participation, social connectedness, and intergenerational relationships. Economic Growth corresponds to the economic dimension of TBL and the organisational level of SEM by measuring income generation, employment opportunities, and financial sustainability. Environmental Effects represent the environmental pillar of TBL by assessing environmental awareness, sustainable practices, and cultural heritage preservation. Operational Factors align with the organisational and community levels of SEM by evaluating management capacity, collaboration, infrastructure, and

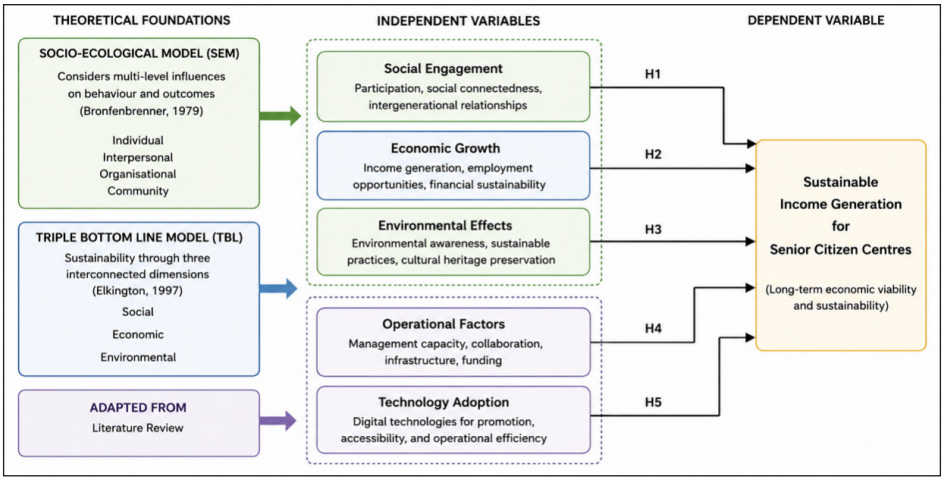

Figure 1. Conceptual Framework of the proposed study
Source: Adapted from Mohammad Mazani et al. (2025)

funding that support tourism initiatives. Finally, Technology Adoption captures organisational innovation and community engagement through digital technologies that enhance tourism promotion, accessibility, and operational efficiency. Collectively, these constructs provide a comprehensive framework for assessing sustainable income generation through art and cultural tourism initiatives in senior citizen centres. The resulting conceptual framework is presented in Figure 1.

Hypothesis Development

Although this study focuses on questionnaire development rather than hypothesis testing, the proposed hypotheses are presented to establish the theoretical relationships underpinning the instrument's constructs. These hypotheses provide the conceptual basis for item development and will be empirically tested in a subsequent large-scale study involving the intended target population.

H1: Social Engagement

Social engagement in art and cultural tourism initiatives has a significant positive impact on sustainable income generation, as involving community members, especially senior citizens, and with their voluntary efforts, it could help promote ownership and local entrepreneurship (Hollands, 2010).

H2: Economic Growth

Economic growth driven by cultural-tourism activities has a significant positive impact on sustainable income generation, and income sources could be different community workshops, events, and product sales (Shahzad et al., 2017; Wahyuni et al., 2022).

H3: Environmental Effects

Positive environmental effects from cultural tourism initiatives can enhance sustainable income generation, and such initiatives could be realised by attempting to protect tourist

attractions and improve destination appeal (McLoughlin et al., 2018; Uslu et al., 2020).

H4: Operational Factors

Strong operational capacity (management, partnerships, and training) has a significant positive impact on sustainable income generation, as the capability can play a profound role in facilitating local resource integration and community member engagement, thereby enhancing scalability, efficiency, and reinvestment in art and cultural tourism initiatives (Ding & Huang, 2021).

H5: Technology Adoption

Technology adoption (digital marketing, online sales, and virtual tours) has a significant positive impact on sustainable income generation, as the efforts may help increase accessibility, reach, and monetisation opportunities on digital platforms, which can aid in improving visibility, promoting local cultures, and engagement with tourists (Zhou & Sotiriadis, 2021).

METHODOLOGY

In the process of creating a questionnaire, there is a structured framework, which involves a few phases and is based on established principles (Creswell, 2014; DeVellis, 2016). Typically, the process starts with having a clear definition of the study objectives and constructs and, at the same time, reviewing existing theories and literature, which are relevant to the topic, to guide the development of questionnaire items (DeVellis, 2016). Usually, the draft version will be iteratively refined through expert review and pre-testing, aiming to have clearer wording and format and also better content clarity, relevance, validity, and reliability (Fraenkel et al., 2011; Oppenheim, 2000). The purpose of all the efforts mentioned above is for robust data collection by following the best practices. Accordingly, this study adopted a systematic 10-step process to develop a questionnaire for assessing sustainable income generation through art and cultural tourism initiatives in senior citizen centres.

Developing a Questionnaire in 10 Steps

To help guarantee that it was valid, reliable, and aligned with the study objectives, the questionnaire was developed in a systematic and rigorous way, which involved 10 sequential steps.

Step 1: Define Objectives

Based on the study objectives, the questionnaire, which was developed in the present study, could help identify which factors could be important to the success of art and cultural tourism initiatives in different gerontological communities. With that, constructs could be tried to be mapped to each questionnaire item as closely as possible, and, at the same time, response formats and analytic plans that were suitable could be chosen. Clearly defining the research objectives provides the foundation for questionnaire development by ensuring that the instrument is aligned

with the intended constructs and research outcomes (Creswell & Creswell, 2018; DeVellis, 2016).

Step 2: Identify Variables

The five independent variables, which were social engagement, economic growth, environmental effects, operational factors, and technology adoption, and the dependent variable, which was sustainable income generation, were operationalised from the study constructs, and the variables could aid in capturing income stability, diversification, and revenue through the organisation of cultural-tourism activities. At the same time, information related to demographic characteristics and organisational profiles was collected. On the other hand, definitions, sample items, and the hypothesised directions of effects were also recorded in the codebook of the current study, reducing measurement bias, guaranteeing consistent interpretation, and allowing for calculating composite scores for each construct in the following analyses. The identification and operationalisation of variables are essential to ensure conceptual clarity and measurement consistency throughout the instrument development process (Boateng et al., 2018; DeVellis, 2016).

Step 3: Review Literature

The questionnaire items were created only after having an extensive review of validated instruments and empirical studies, spanning gerontology, tourism, cultural management, and sustainability, and the items were adapted to fit the context of Malaysian senior citizen centres and offered special attention to indicators related to art and cultural tourism initiatives. As such, it could ensure good theoretical validity, and the developed questionnaire items could be more accurate in reflecting local cultural practices and the typical activities of senior citizens. A comprehensive literature review is fundamental for identifying validated measurement items and establishing content relevance, thereby enhancing the validity and reliability of the questionnaire (Boateng et al., 2018).

Step 4: Draft Questions

The questionnaire items were developed by adapting measurement items from previously validated instruments where available and by referring to conceptual discussions in the relevant literature where validated measurement items were unavailable. Item selection was guided by the study objectives, the operational definitions of each construct, and their alignment with the Triple Bottom Line (TBL) framework and the Socio-Ecological Model (SEM). Minor modifications were made to ensure relevance to the Malaysian context and senior citizen centres while preserving the original conceptual meaning of the items. The questionnaire was designed to balance factual information, such as senior citizen centre demographics, membership size, tourism activities, and funding sources, with perceptual measures related to social engagement, economic growth, environmental effects, operational factors, technology adoption, and sustainable

income generation. To improve clarity and minimise response bias, all items were written in clear, neutral language, avoiding technical jargon, ambiguous wording, and double-barrelled questions. Items belonging to the same construct were grouped together to facilitate subsequent reliability and statistical analyses.

Table 1 presents the proposed questionnaire items, their corresponding constructs, and the references that informed the development of each item. The supporting references include both validated measurement instruments and conceptual literature that informed the development of the questionnaire items.

Table 1
Draft questionnaire items

Dependent Variable				
Variable	**Code**	**Measurement Item**	**Questions**	**Supporting Reference**
Sustainable Income Generation	SI1	Income Stability	I believe revenue from art and cultural tourism initiatives can contribute to a stable income for senior citizens.	Dillard et al. (2008)
	SI2	Financial Independence	I expect these initiatives to provide financial opportunities that may reduce dependency on external support.	Kennedy et al. (2013)
	SI3	Job Creation	I anticipate that such programmes could generate job opportunities for elderly individuals and their communities.	Converso et al. (2018)
	SI4	Revenue Growth	I think participation in cultural tourism could potentially increase financial returns for senior citizen centres.	Gayeta and Ylagan (2022)
	SI5	Long-term Sustainability	I believe the economic benefits from these initiatives could be sustainable over the long term.	Michalos et al. (2012)
Independent Variable				
Variable	**Code**	**Measurement Item**	**Questions**	**Supporting Reference**
Social Engagement	SE1	Community Bonding	I believe participating in art and cultural tourism can help senior citizens feel more connected.	Oe and Tadaka (2023)
	SE2	Sense of Belonging	I expect cultural tourism events to create a stronger sense of belonging for the elderly.	
	SE3	Well-being and Quality of Life	I think social interactions in cultural tourism activities could improve seniors' well-being.	
	SE4	Social Networking	I believe joining cultural tourism activities can help elderly individuals build social connections.	
	SE5	Intergenerational Relationships	I expect these activities to encourage relationships between different generations in the community.	

Table 1 (*continued*)

Independent Variable				
Variable	**Code**	**Measurement Item**	**Questions**	**Supporting Reference**
Economic Growth	EG1	Business Growth	I believe cultural tourism can help increase revenue for local businesses that support senior centres.	Gursoy et al. (2010)
	EG2	Job Creation	I expect cultural tourism to create job opportunities for senior citizens.	Nunkoo and Ramkissoon (2011)
	EG3	Tourism Expansion	I think cultural tourism could help seniors expand handicrafts, performances, and guided tours.	Stylidis and Terzidou (2014)
	EG4	Investment Support	I believe cultural tourism may attract government and private sector investments in senior centres.	Sharpley and Telfer (2015)
	EG5	Financial Sustainability	I expect cultural tourism to provide a sustainable income for senior communities.	Mihalic (2016)
Environmental Effects	EE1	Environmental Conservation	I believe cultural tourism can help raise environmental awareness among visitors and local communities.	Choi and Sirakaya (2006)
	EE2	Sustainable Practices	I expect tourism initiatives to encourage eco-friendly practices in senior centres.	Lee and Jan (2019)
	EE3	Preservation of Cultural Sites	I think cultural tourism could support the preservation of historical and cultural sites.	Kim et al. (2013)
	EE4	Community Involvement	I believe local communities may engage in sustainable tourism activities that benefit senior centres.	Miller et al. (2010)
	EE5	Long-term Environmental Benefits	I expect eco-friendly tourism to contribute to long-term environmental sustainability for senior communities.	Dolnicar and Leisch (2008)
Operational Factors	OF1	Infrastructure	I believe good infrastructure can help cultural tourism succeed.	Chhabra (2010)
	OF2	Management	I expect strong management to improve tourism programmes.	Timothy and Boyd (2003)
	OF3	Funding	I think financial support is important for sustaining cultural tourism.	Ritchie and Crouch (2003)
	OF4	Marketing	I believe good promotions can attract more visitors.	Buhalis (2000)
	OF5	Collaboration	I expect collaboration to contribute to the success of cultural tourism.	Bramwell and Lane (2000)

Table 1 (*continued*)

Independent Variable				
Variable	**Code**	**Measurement Item**	**Questions**	**Supporting Reference**
Technology Adoption	TA1	Digital Presence	I believe technology can help promote cultural tourism.	Buhalis and Law (2008)
	TA2	Convenience	I expect online systems to make tourism more accessible.	Kim et al. (2009)
	TA3	Visitor Experience	I think technology could improve tourism experience.	Tussyadiah et al. (2018)
	TA4	Information Access	I believe technology can make cultural information easier to find.	Gretzel et al. (2015)
	TA5	Efficiency	I expect technology to help manage tourism operations more effectively.	Sigala (2018)

Step 5: Choose Response Format

The five-point Likert scale, ranging from 1 as 'strongly disagree' to 5 as 'strongly agree', was selected as the main format for collecting responses for items measuring attitudes, as the scale would be more sensitive and could be easily used by respondents. There were categorical questions, such as the type of centre and main funding sources; numerical questions, such as approximate monthly income from tourism activities; and open-ended questions capturing emergent themes to complement the attitudinal items. Using a mixed response format could increase the robustness of quantitative analyses, especially descriptive statistics and regression, and, at the same time, retain qualitative perspectives for better development of the current conceptual framework.

Step 6: Check Language

The questionnaire was translated from English into Malay using a forward-translation and back-translation procedure to ensure conceptual equivalence between both language versions. Parallel bilingual review and back-translation checks were conducted to minimise translation drift and maintain consistency in meaning, language level, and terminology. Any discrepancies identified during the translation process were discussed and resolved through consensus among the research team, resulting in a questionnaire that was clear, culturally appropriate, and easily understood by the intended respondents.

Step 7: Face Validation

Five academicians from Malaysian public universities with expertise in research methodology, questionnaire development, and psychometrics were invited through formal letters to participate in the face validation process. They evaluated the draft questionnaire in terms of clarity, wording, logical flow, readability, respondent burden, and overall suitability for the intended

respondents. Their feedback led to several refinements, including simplifying item wording, rearranging demographic and organisational profile questions to the beginning of the questionnaire, removing ambiguous or overly technical expressions, and improving the overall layout and instructions to enhance readability and cultural appropriateness for administrators and staff of senior citizen centres.

Step 8: Content Validation

Following face validation, the revised questionnaire underwent content validation by a panel of five subject matter experts from Malaysian public universities with expertise in art and cultural tourism, community development, sustainable tourism, and older adult studies. The experts evaluated the relevance, representativeness, and adequacy of the questionnaire items in measuring each construct, as well as their alignment with the study objectives and theoretical framework. Based on their recommendations, redundant items were removed, the coverage of accessibility and inclusion within the Operational Factors construct was strengthened, and several items were reworded to improve their relevance to the responsibilities and experiences of administrators and staff of senior citizen centres.

Step 9: Questionnaire Revision

Based on the recommendations from the face and content validation processes, the questionnaire was revised to improve its clarity, relevance, and overall usability before pilot testing. The revisions included simplifying item wording, refining response instructions, rearranging the sequence of demographic and organisational profile questions, removing redundant or overly technical items, and strengthening under-represented aspects, particularly accessibility and inclusion within the Operational Factors construct. These refinements enhanced the questionnaire's readability, cultural appropriateness, and alignment with the study objectives while preserving the conceptual meaning of each construct.

Step 10: Pilot Testing

The revised questionnaire was pilot tested with 30 university lecturers to evaluate its clarity, readability, completion time, and preliminary reliability before administration to the intended target population. The lecturers were purposively selected because of their expertise in research methodology, questionnaire development, tourism, community development, and social sciences. Although they did not represent the actual target population, the pilot study aimed to identify any remaining issues with the instrument and assess its preliminary internal consistency. A sample of 30 respondents was considered appropriate for this purpose, as the adequacy of pilot sample size depends on the study objectives rather than a universal rule of thumb (Johanson & Brooks, 2010; Martínez-Abraín, 2014; Mascha & Vetter, 2018). The pilot results indicated an acceptable questionnaire completion time and excellent internal consistency, with

Table 2
Cronbach's alpha

Dependent Variable		
Variable	**Number of Items**	**Cronbach's Alpha**
Sustainable Income Generation	5	0.946
Independent Variable		
Variable	**Number of items**	**Cronbach's Alpha**
Social Engagement	5	0.961
Economic Growth	5	0.898
Environmental Effects	5	0.952
Operational Factors	5	0.917
Technology Adoption	5	0.967

Table 3
Overall Cronbach's alpha

Reliability Statistics	
Number of Items	**Cronbach's Alpha**
30	0.977

Cronbach's alpha values ranging from 0.898 to 0.967 (Table 2) and an overall reliability coefficient of 0.977 (Table 3). These findings provide preliminary evidence that the questionnaire is suitable for administration in the main study.

RESULTS AND DISCUSSION

The pilot testing demonstrated excellent internal consistency across all constructs, with Cronbach's alpha values ranging from 0.898 to 0.967 and an overall reliability coefficient of 0.977. These findings indicate that the questionnaire items consistently measured their intended constructs and provide preliminary evidence of the instrument's reliability. According to DeVellis (2016), reliability coefficients above 0.70 indicate acceptable internal consistency for newly developed instruments. Although the overall Cronbach's alpha value of 0.977 may suggest potential item redundancy, the instrument comprises six theoretically distinct constructs that were systematically developed through literature-based item adaptation, bilingual translation, expert validation, and pilot testing. This rigorous 10-step questionnaire development process enhances methodological transparency and supports the development of contextually appropriate instruments, consistent with the recommendations of DeVellis (2016) and Boateng et al. (2018).

Beyond its methodological contribution, the proposed questionnaire offers practical value for researchers, practitioners, and policymakers involved in tourism, community development, and active

ageing initiatives. It provides a structured approach for assessing factors influencing sustainable income generation through art and cultural tourism programmes in senior citizen centres and may assist government agencies, local authorities, and community organisations in designing, monitoring, and evaluating tourism-based economic empowerment initiatives. Nevertheless, further psychometric validation using a larger sample from the intended target population is required to establish construct validity before the instrument is widely adopted in empirical research and policy evaluation.

CONCLUSION

This study proposed a systematic 10-step questionnaire development framework for art and cultural tourism research. On the one hand, it could contribute to methodological scholarships. On the other hand, there were some practical benefits for researchers seeking to examine how senior citizen centres could generate income in sustainable ways. With a transparent process described by the current researchers, it could help foster replication, adaptation, and improvement in methodological standards in different contexts in upcoming studies. One limitation of this study is that the pilot testing involved university lecturers rather than the intended respondents from senior citizen centres. Although appropriate for preliminary instrument evaluation, future studies should validate the instrument using the actual target population to further establish its psychometric properties.

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REFERENCES

Abdul Rasid, M. S., Badarulzaman, N., & Jaafar, M. (2013). George Town, Penang as a World Heritage Site: The stakeholders' perceptions. *Procedia - Social and Behavioral Sciences, 91*, 88-96. https://doi.org/10.1016/j.sbspro.2013.08.405

Balqis-Ali, N. Z., & Fun, W. H. (2024). Social support in maintaining mental health and quality of life among community-dwelling older people with functional limitations in Malaysia: A population-based cross-sectional study. *BMJ Open, 14*(5), Article e077046. https://doi.org/10.1136/bmjopen-2023-077046

Boateng, G. O., Neilands, T. B., Frongillo, E. A., Melgar-Quiñonez, H. R., & Young, S. L. (2018). Best practices for developing and validating scales for health, social, and behavioral research: A primer. *Frontiers in Public Health, 6*, 149. https://doi.org/10.3389/fpubh.2018.00149

Bramwell, B., & Lane, B. (2000). Collaboration and partnerships in tourism planning. In B. Bramwell & B. Lane (Eds.), *Tourism collaboration and partnerships: Politics, practice and sustainability* (pp. 1-19). Channel View Publications. https://doi.org/10.21832/9780585354224-003

Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Harvard University Press.

Buhalis, D. (2000). Marketing the competitive destination of the future. *Tourism Management, 21*(1), 97-116. https://doi.org/10.1016/S0261-5177(99)00095-3

Buhalis, D., & Law, R. (2008). Progress in information technology and tourism management: 20 years on and 10 years after the Internet—The state of eTourism research. *Tourism Management, 29*(4), 609-623. https://doi.org/10.1016/j.tourman.2008.01.005

Buhalis, D., Leung, X. Y., Fan, D., Darcy, S., Chen, G., Xu, F., Wei-Han Tan, G., Nunkoo, R., & Farmaki, A. (2023). Tourism 2030 and the contribution to the sustainable development goals: The Tourism Review viewpoint. *Tourism Review, 78*(2), 293-313. https://doi.org/10.1108/TR-04-2023-620

Chhabra, D. (2010). *Sustainable marketing of cultural and heritage tourism*. Routledge. https://doi.org/10.4324/9780203855416

Choi, H. C., & Sirakaya, E. (2006). Sustainability indicators for managing community tourism. *Tourism Management, 27*(6), 1274-1289. https://doi.org/10.1016/j.tourman.2005.05.018

Converso, D., Sottimano, I., Guidetti, G., Loera, B., Cortini, M., & Viotti, S. (2018). Ageing and work ability: The moderating role of job and personal resources. *Frontiers in Psychology, 8*, Article 2262. https://doi.org/10.3389/fpsyg.2017.02262

Creswell, J. W. (2014). *Research design: Qualitative, quantitative and mixed methods approaches*. SAGE Publications, Inc.

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications.

Department of Statistics Malaysia. (2025). *MYAGEING dashboard*. Department of Statistics Malaysia. https://www.dosm.gov.my/portal-main/article/myageing

DeVellis, R. F. (2016). *Scale development: Theory and applications* (4th ed.). SAGE Publications.

Ding, R., & Huang, M. (2021). The spatial difference of "Internet Plus Tourism" in promoting economic growth. *Sustainability, 13*(21), Article 11788. https://doi.org/10.3390/su132111788

Dillard, J., Dujon, V., & King, M. C. (Eds.). (2008). *Understanding the social dimension of sustainability*. Routledge. https://doi.org/10.4324/9780203892978

Dolnicar, S., & Leisch, F. (2008). An investigation of tourists' patterns of obligation to protect the environment. *Journal of Travel Research, 46*(4), 381-391. https://doi.org/10.1177/0047287507308330

Elkington, J. (1997). *Cannibals with forks: The triple bottom line of 21st century business*. Capstone.

Fancourt, D., & Finn, S. (2019). *What is the evidence on the role of the arts in improving health and well-being? A scoping review* (Health Evidence Network Synthesis Report No. 67). World Health Organization Regional Office for Europe.

Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2011). *How to design and evaluate research in education*. McGraw-Hill Education.

Gayeta, M. G., & Ylagan, A. D. (2022). Tourist satisfaction, perceived value, and behavioural intention to revisit cultural heritage tourists: Basis for development plan. *International Journal of Research Studies in Management, 10*(3). https://doi.org/10.5861/ijrsm.2022.33

Gretzel, U., Sigala, M., Xiang, Z., & Koo, C. (2015). Smart tourism: Foundations and developments. *Electronic Markets, 25*(3), 179-188. https://doi.org/10.1007/s12525-015-0196-8

Gursoy, D., Chi, C. G., & Dyer, P. (2010). Locals' attitudes toward mass and alternative tourism: The case of Sunshine Coast, Australia. *Journal of Travel Research, 49*(3), 381-394. https://doi.org/10.1177/0047287509346853

Hollands, R. G. (2010). Engaging and alternative cultural tourism? *Journal of Cultural Economy, 3*(3), 379-394. https://doi.org/10.1080/17530350.2010.506324

Johanson, G. A., & Brooks, G. P. (2010). Initial scale development: Sample size for pilot studies. *Educational and Psychological Measurement, 70*(3), 394-400. https://doi.org/10.1177/0013164409355692

Kennedy, C. E., Fonner, V. A., O'Reilly, K. R., & Sweat, M. D. (2013). A systematic review of income generation interventions, including microfinance and vocational skills training, for HIV prevention. *AIDS Care, 26*(6), 659-673. https://doi.org/10.1080/09540121.2013.845287

Kim, D. J., Ferrin, D. L., & Rao, H. R. (2009). Trust and satisfaction, two stepping stones for successful e-commerce relationships: A longitudinal exploration. *Information Systems Research, 20*(2), 237-257. https://doi.org/10.1287/isre.1080.0188

Kim, K., Uysal, M., & Sirgy, M. J. (2013). How does tourism in a community impact the quality of life of community residents? *Tourism Management, 36*, 527-540. https://doi.org/10.1016/j.tourman.2012.09.005

Lee, T. H., & Jan, F.-H. (2019). Can community-based tourism contribute to sustainable development? Evidence from residents' perceptions of the sustainability. *Tourism Management, 70*, 368-380. https://doi.org/10.1016/j.tourman.2018.09.003

Martínez-Abraín, A. (2014). Is the n = 30 rule of thumb of ecological field studies reliable? A call for greater attention to the variability in our data. *Animal Biodiversity and Conservation, 37*(1), 95-100.

Mascha, E. J., & Vetter, T. R. (2018). Significance, errors, power, and sample size: The blocking and tackling of statistics. *Anesthesia & Analgesia, 126*(2), 691-698. https://doi.org/10.1213/ANE.0000000000002741

McLoughlin, E., Hanrahan, J., Duddy, A., & Duffy, S. (2018). European tourism indicator system for sustainable destination management in County Donegal, Ireland. *European Journal of Tourism Research, 20*, 78-91. https://doi.org/10.54055/ejtr.v20i.341

Michalos, A. C., Creech, H., Swayze, N., Kahlke, P. M., Buckler, C., & Rempel, K. (2012). Measuring knowledge, attitudes and behaviours concerning sustainable development among tenth grade students in Manitoba. *Social Indicators Research, 106*(2), 213-238. https://doi.org/10.1007/s11205-011-9809-6

Mihalic, T. (2016). Sustainable-responsible tourism discourse—Towards 'responsustable' tourism. *Journal of Cleaner Production, 111*, 461-470. https://doi.org/10.1016/j.jclepro.2014.12.062

Miller, G., Rathouse, K., Scarles, C., Holmes, K., & Tribe, J. (2010). Public understanding of sustainable tourism. *Annals of Tourism Research, 37*(3), 627-645. https://doi.org/10.1016/j.annals.2009.12.002

Mohammad Mazani, N. Z. A., Abdul Aziz, M. N., Ibrahim, N. H., Ramlie, M. K., & Dzulkifly, N. A. (2025). Art and cultural tourism for sustainable income: A conceptual framework for senior citizen centres in Malaysia. *Idealogy, 10*(2), 560-568. https://doi.org/10.24191/idealogy.v10i2.845

Nogales-Muriel, R., Andersen, L. L., & Ferreira, S. (2024). Guest editorial: Unlocking the transformative potential of culture and the arts: Innovative practices and policies from social enterprises and third-sector organisations. *Social Enterprise Journal, 20*(2), 113-122. https://doi.org/10.1108/SEJ-03-2024-143

Nunkoo, R., & Ramkissoon, H. (2011). Residents' satisfaction with community attributes and support for tourism. *Journal of Hospitality & Tourism Research, 35*(2), 171-190. https://doi.org/10.1177/1096348010384600

Oe, N., & Tadaka, E. (2023). Development of the Self-efficacy for Social Participation scale (SOSA) for community-dwelling older adults. *BMC Public Health, 23*(1), Article 2294. https://doi.org/10.1186/s12889-023-16774-6

Oppenheim, A. N. (2000). *Questionnaire design, interviewing and attitude measurement*. Bloomsbury Publishing.

Phillipson, C. (2013). *Ageing*. Polity Press.

Ritchie, J. R. B., & Crouch, G. I. (2003). *The competitive destination: A sustainable tourism perspective*. CABI. https://doi.org/10.1079/9780851996646.0000

Shahzad, S. J. H., Shahbaz, M., Ferrer, R., & Kumar, R. R. (2017). Tourism-led growth hypothesis in the top ten tourist destinations: New evidence using the quantile-on-quantile approach. *Tourism Management, 60*, 223-232. https://doi.org/10.1016/j.tourman.2016.12.006

Sharpley, R., & Telfer, D. J. (2015). *Tourism and development: Concepts and issues*. Channel View Publications.

Sigala, M. (2018). New technologies in tourism: From multi-disciplinary to anti-disciplinary advances and trajectories. *Tourism Management Perspectives, 25*, 151-155. https://doi.org/10.1016/j.tmp.2017.12.003

Stylidis, D., & Terzidou, M. (2014). Tourism and the economic crisis in Kavala, Greece. *Annals of Tourism Research, 44*, 210-226. https://doi.org/10.1016/j.annals.2013.10.004

Timothy, D. J., & Boyd, S. W. (2003). *Heritage tourism*. Pearson Education.

Tussyadiah, I. P., Wang, D., Jung, T. H., & Tom Dieck, M. C. (2018). Virtual reality, presence, and attitude change: Empirical evidence from tourism. *Tourism Management, 66*, 140-154. https://doi.org/10.1016/j.tourman.2017.12.003

UNESCO World Heritage Centre. (2024). *From port city to World Heritage site: Case study of George Town (Malaysia)*. https://whc.unesco.org/en/canopy/georgetown-2

Uslu, A., Alagöz, G., & Güneş, E. (2020). Socio-cultural, economic, and environmental effects of tourism from the point of view of the local community. *Journal of Tourism and Services, 11*(21), 1-21. https://doi.org/10.29036/jots.v11i21.147

Wahyuni, N., Mediaty, M., & Rasyid, S. (2022). The influence of the tourism sector on regional financial performance with economic growth as a mediating variable in improving community welfare. *Journal of Tourism Economics and Policy, 2*(3), 192-202. https://doi.org/10.38142/jtep.v2i3.405

World Health Organization. (2021). *Decade of healthy ageing: Baseline report*. https://www.who.int/publications/i/item/9789240017900

Zhou, C., & Sotiriadis, M. (2021). Exploring and evaluating the impact of ICTs on culture and tourism industries' convergence: Evidence from China. *Sustainability, 13*(21), Article 11769. https://doi.org/10.3390/su132111769

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Review Article

Research Trends in Chinese Traditional Gardens: A Bibliometric Analysis

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ABSTRACT

Traditional Chinese gardens, as an important form of cultural heritage, embody China's unique philosophy, values, and aesthetic sensibilities. Most existing reviews are primarily qualitative and lack a systematic analysis of the bibliometric characteristics of research on Chinese traditional gardens. This study used CiteSpace and VOSviewer to examine the research trends and future directions of Chinese traditional garden studies. The analysis covered 203 publications published between 2006 and 2025, focusing on bibliometric characteristics such as publication trends, core journals and cited sources, keyword visualisation and clustering, geographical distribution, and temporal evolution. The results indicate that both research output and thematic interest in this field have generally increased in recent years. However, the geographical distribution remains uneven, with research activity primarily concentrated in East Asian countries, particularly China, Japan, and South Korea. Temporal evolution and clustering analyses identified five major thematic trajectories in this field: garden history and contemporary significance, aesthetic properties and humanmade paradise, audiovisual interaction and Chinese landscape painting, classical Chinese royal garden, and cold-winter zone. Based on these themes, the study identified several key challenges, including the limited use of mixed methods, insufficient attention to the sustainable development of regional gardens, and an imbalance between authenticity conservation and heritage revitalisation. This

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review provides directions for advancing Chinese traditional garden research from aesthetic and historical interpretation toward a measurable, verifiable, applicable, and interdisciplinary field.

Keywords: Bibliometric analysis, CiteSpace, cultural heritage, traditional Chinese gardens, VOSviewer

INTRODUCTION

The International Council on Monuments and Sites (ICOMOS, 1982) defined historic gardens in the Florence Charter (1982) as cultural landscapes formed through the joint composition of architecture and horticulture, and possessing historical and artistic value (Scazzosi, 2004). As a category of heritage that carries cultural memory, the historic garden continues to shape human aesthetic judgment and spatial cognition across temporal distance and provides critical insights for contemporary culture and design practices (Hall & Ames, 1987; Hunt, 1992; Li, 2012; Rinaldi, 2012). The conservation and study of historic gardens therefore contribute to the transmission of cultural memory and aesthetic tradition (Rinaldi, 2012; Zhang & Zhang, 2024).

Chinese traditional gardens (CTGs) can be traced back to the ritual-oriented royal parks of the Yellow River Basin and the Central Plains during the pre-Qin period (before 221 BCE). During the Han dynasty (206 BCE-220 CE), imperial palace gardens developed in Chang'an (present-day Xi'an, Shaanxi Province) and Luoyang in the Central Plains (present-day Luoyang, Henan Province) and reached their height during the Tang dynasty (618-907 CE). From the Song dynasty onward (960-279 CE), literati gardens gradually matured in Kaifeng, Lin'an, and the Jiangnan region, forming a distinctive system characterised by "conceiving the garden through poetry and shaping it according to painting" (K Gholinejad Pirbazari et al., 2021; Keswick & Hardie, 2003).The art of garden-making in CTGs was shaped by Confucian, Buddhist, and Daoist thought, emphasising the philosophical notion of the "unity of heaven and humanity" (Kiani & Khakzand, 2024; Needham, 1974) and its spatial organisation and planting schemes often embodied the ideals and sensibilities of the scholarly elite (Cooper, 2017; Xia & Zhou, 2024). CTGs organise spatial experience and construct aesthetic atmosphere through techniques such as borrowed scenery, aligned or opposing vistas, screened views, and framed views, and they simultaneously fulfill multiple roles, including sightseeing, self-cultivation, repose, and cultural exchange (Cooper, 2017; Xia & Zhou, 2024). As a key symbolic expression of Chinese culture, CTGs are not only a landscape form but also a vehicle for aesthetic ideology and cultural ethos (Thacker, 1985; Wang, 2015).

The generative philosophy of traditional Chinese gardens emphasises respecting and revering nature, while undertaking highly artistic creation based on natural landscapes (Liu, 2012). Chinese horticulturists believe that nature should not be an object to be

conquered and reconstructed, but rather a model to be imitated and learned from (Huang, 2008). Spatial imagery is one of the artistic characteristics of garden aesthetics and spiritual features, extending the depth of the spatial landscape and creating spatial hierarchical sequences to enhance the visitor's appreciation (Tsu, 1988). On the other hand, traditional Chinese painting, poetry, and calligraphy play a key role in the creation of garden space, integrating their spiritual and cultural connotations into pavilions, plaques, couplets, stone carvings, etc., constructing a comprehensive space of garden spatial imagery and artistic realm (Xu et al., 2016). Garden architecture commonly appears in the form of pavilions, terraces, towers, and waterside pavilions, which are located within the garden according to their function and design form, providing architectural spaces for tourists to visit, rest, and appreciate (Feng, 2007). Water features and artificial hills are important elements in gardens. Water, as a flowing product of nature, creates a tranquil space within the garden through its form, color, and sound, enhancing the auditory and visual experience of visitors and purifying the mind (Wu et al., 2020). Artificial hills are an important element of traditional Chinese gardens, showcasing the formal carriers of Chinese landscape painting culture and creating a layered, enchanting space within the garden (Liang et al., 2019).

Previous studies on Chinese traditional gardens have primarily addressed their aesthetic characteristics and cultural meanings, the conservation and revitalisation of historic gardens, and interdisciplinary topics such as cultural heritage tourism and tourists' perceptions of authenticity. Despite the substantial body of research accumulated in these areas, the literature remains fragmented across different disciplines, with limited systematic synthesis of the overall knowledge structure and interdisciplinary relationships within the field. Bibliometric analyses of Chinese traditional garden research published between 2006 and 2025 remain limited. Existing reviews are predominantly descriptive and qualitative, with insufficient use of bibliometric visualisation and limited integration of the PRISMA process with the PCC framework. Therefore, a systematic bibliometric review of this field is warranted. This study uses CiteSpace and VOSviewer tools to conduct bibliometric analysis on the field of traditional Chinese gardens. Specifically, (1) what are the academic hotspots and development trends in the field of traditional Chinese gardens? (2) How are the research topics distributed in this field? (3) What are the future research directions? In summary, this review identifies the development trends and future research directions of Chinese traditional gardens and contributes to a more systematic bibliometric knowledge framework for the field. The findings can help cultural heritage managers, garden conservation practitioners, and landscape designers identify conservation priorities, while also providing guidance for advancing digital management and achieving a better balance between heritage conservation and revitalisation.

METHODS AND MATERIALS

Search Strategy and Criteria

This study searched the Web of Science database up to September 2025 using the search terms "Classical Garden" OR "Traditional Garden" OR "Historic Garden" OR "Scholar Garden" OR "Private Garden" AND "Chinese" OR "China". The search operations used the Boolean AND and OR operators. The PCC (Population, Concept, Context) framework was employed to guide the development of the search strategy (Munn et al., 2019), as presented in Table 1. (1) The object of study is Chinese Traditional Gardens (CTGs) (including classical gardens, historic gardens, literati gardens, and private gardens), with no restriction on specific garden subtype. (2) The study addresses disciplinary themes related to CTGs, such as knowledge structures, cultural value, conservation and utilisation, historical research, digital documentation and analysis, and landscape characteristics. (3) The data source is the Web of Science Core Collection; the publication year falls between 2006 and 2025; and both the title and keywords contain terminology associated with traditional gardens. All retrieved records were exported to EndNote 21 for reference management and duplicate removal, after which subsequent screening was conducted.

Table 1
PCC criteria for inclusion of studies

Items	Detailed Inclusion Criteria
Population	Chinese Traditional Gardens
Concept	Academic studies concerning the theories, methodologies, or practices related to Chinese Traditional Gardens (CTGs)
Context	Web of Science Core Collection (2006–2025); Article

Source: Authors' own work

Study Selection

The screening procedure in this study followed the PRISMA 2020 workflow (Page et al., 2021), and the number of excluded records together with the specific reasons for exclusion are reported in the flow diagram (Figure 1). An initial screening was conducted on articles whose titles and abstracts indicated relevance to the research scope, together with their publication of information. Applying to the inclusion and exclusion criteria described above, an initial set of N = 1,309 records was identified, from which N = 203 studies were ultimately retained. The literature screening process is handled by two staff members. If any disagreements arise during the screening process, a third party will be invited to intervene to ensure the rationality and scientific validity of the included literature.

Data Analysis

This study employs a combined approach using CiteSpace and VOSviewer to perform bibliometric analysis (Figure 2). CiteSpace is a knowledge mapping tool that integrates principles of bibliometrics and information visualisation; it presents, through an intuitive visual interface, the interactions, evolution, and complex relationships among knowledge units and clusters

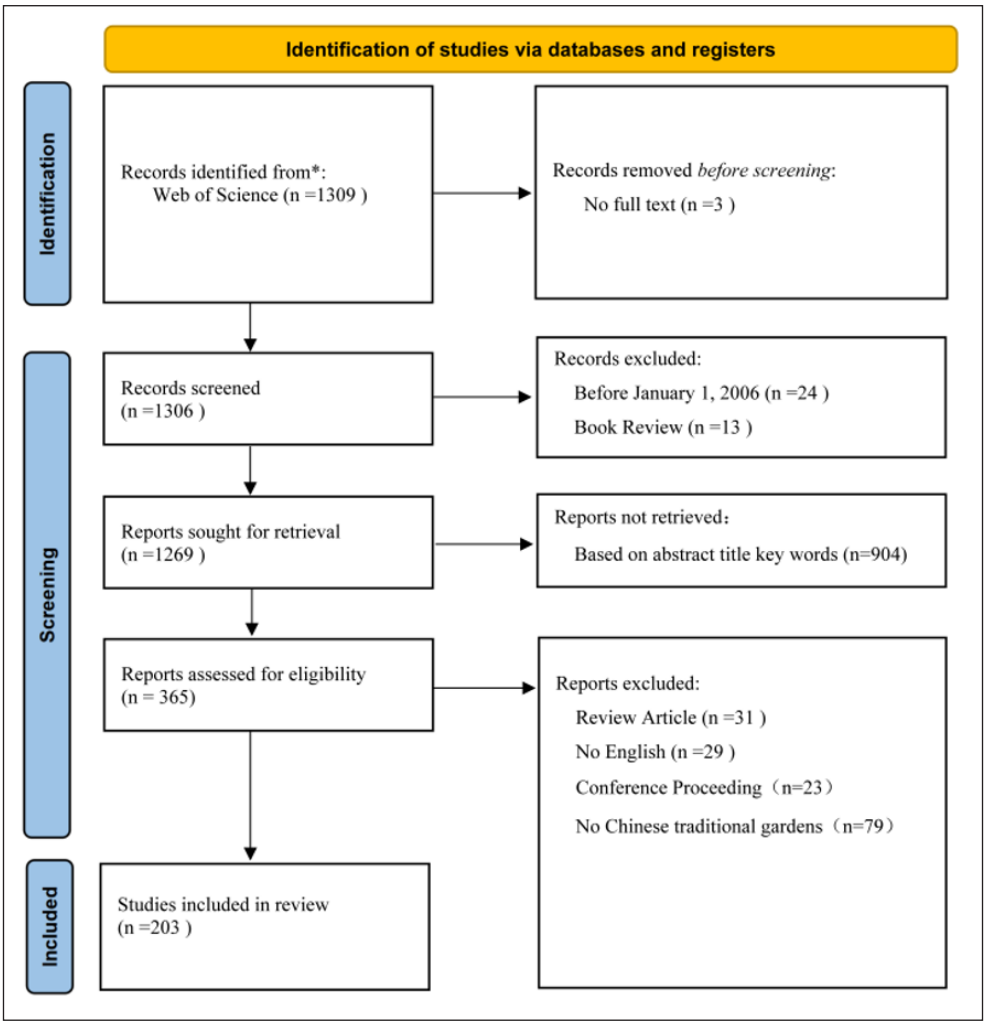

Figure 1. PRISMA flow diagram

within a research network (Chen, 2006). By generating knowledge mapping with CiteSpace, this study conducts a systematic review of the literature within the defined research domain and explicitly visualises the research structure, developmental trajectory, and patterns of evolution. In contrast, VOSviewer places greater emphasis on revealing structural relationships among publications through network clustering, and it applies association-strength normalisation to process co-occurrence matrices in order to ensure the reliability of link strength between nodes (van Eck & Waltman, 2010). This study applies CiteSpace to construct knowledge mapping and generate visual analyses of the screened literature, in order to systematically sort out the knowledge structure and evolutionary trajectory of research on Chinese Traditional Gardens

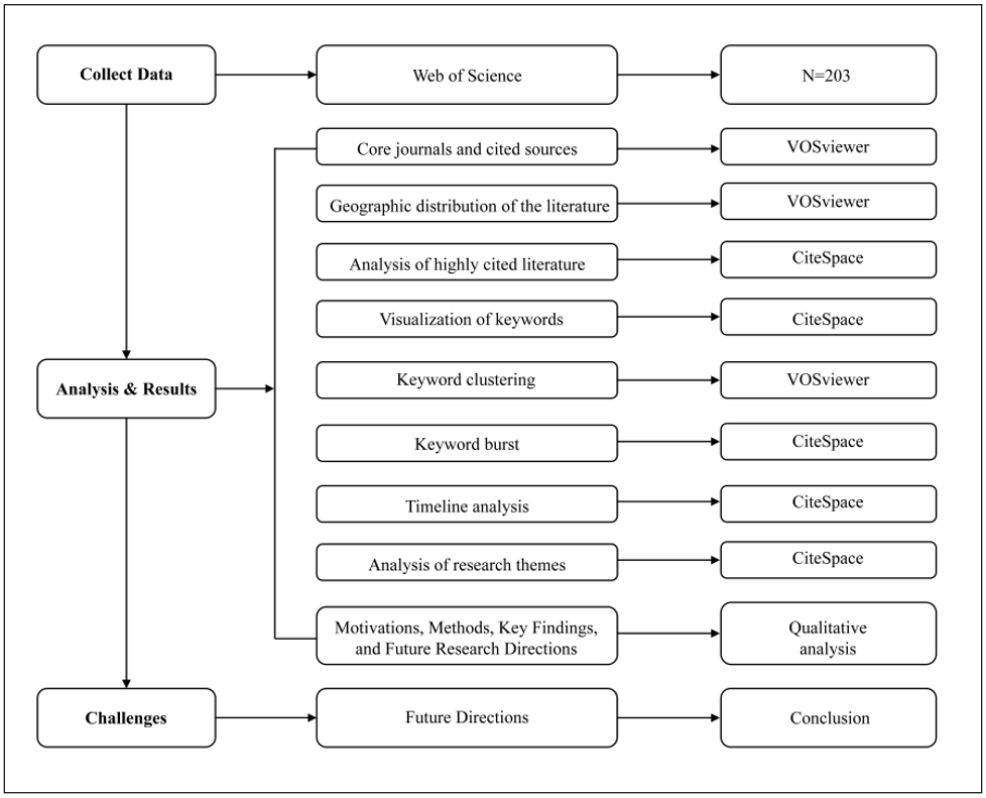

Figure 2. Outline of the research framework

(CTGs). The analysis includes highly cited literature, keyword visualisation and burst detection, temporal evolution patterns, and co-citation clustering, with the aim of identifying major research hotspots and emerging frontiers. On the other hand, VOSviewer software was used to analyse core journals and citation sources, geographical distribution of literature, and keyword clustering analysis.

RESULTS AND DISCUSSION

Publication Volume

This review, based on the WOS database, statistically analyses the publication volume of the 203 included articles (Figure 3). From 2006 to 2025, research on traditional Chinese gardens generally showed an upward trend, with the highest number of publications in 2024, reflecting the peak of academic output. From 2006 to 2009, the number of publications was extremely low, with only 4 articles, indicating that the field was in its nascent stage and did not receive much attention from the academic community. From 2010 to 2015, the number of publications rose each year, though at a relatively slow pace. After 2016, a second downturn emerged, and output reached its lowest level in 2019 to 2020, with only five articles published, suggesting that research on traditional Chinese gardens had

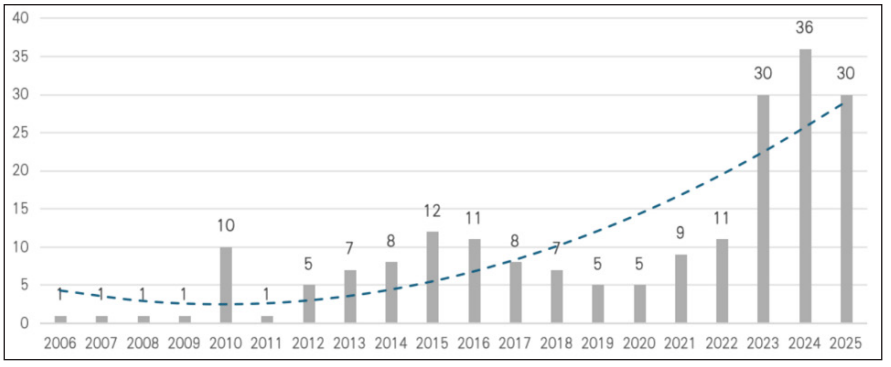

Figure 3. Annual publication trends in historical garden research, 2006-2025

approached saturation and that foundational disciplinary discussions had largely been consolidated. From 2021 to 2025, publication volume increased substantially and peaked in 2024. This pattern indicates that, on the basis of consolidated disciplinary knowledge, methodological innovation and interdisciplinary integration have become more evident in the field.

Core Journals and Cited Sources Overview

This study used VOSviewer to analyse the most frequently cited publications (Table 2) and the foundations of citation analysis were laid by Garfield (1955), while co-citation analysis was introduced by Small (1973). Through cited-source profiling, to identify emerging hotspots and future research directions in the field of traditional Chinese gardens. We identified the top 16 core journals with the highest citation counts, which serve as key platforms for scholarly production and dissemination in this area. The Journal of Cultural Heritage had the highest co-citation frequency, with a total link of strength of T=32 and 123 co-citations, indicating strong authority and influence within the cultural heritage domain.

Secondly, Sustainability and Heritage Science have citation counts of 90 and 78 respectively, with total link strengths (T=39 and T=36). Their academic contributions and research scope have had a significant impact, promoting the dissemination of traditional landscape architecture in international journals and driving its core role in constructing disciplinary knowledge.

Analysis of Article Regions

To present research output and collaboration networks more clearly, VOSviewer was used with inclusion thresholds set at a minimum of one publication and at least two citations. Among the 23 identified countries/regions, 17 met these initial thresholds. To ensure that the collaboration network reflected only actual collaborative relationships, nodes with a Total Link Strength (TLS) of 0 (Denmark, Poland, Romania, Ukraine) were further excluded. Ultimately, 13 countries/regions were retained for quantitative analysis (Table 3).

Table 2
Cited journals and sources

Year	Journal	Total Link Strength	Article Number	Citation Number	Norm Citation	Avg. Citation	Avg. Norm Citation
2022	Sustainability	39	11	90	12.9	8.1	1.17
2023	Heritage Science	36	11	78	16.1	7.0	1.46
2019	Journal of Cultural Heritage	32	3	123	7.4	41	2.50
2024	Journal of Asian Architecture and Building Engineering	28	10	18	7.5	1.8	0.76
2023	Land	19	6	39	9.5	6.5	1.59
2018	Studies in The History of Gardens & Designed Landscapes	18	9	32	4.6	3.5	0.52
2022	Frontiers of Architectural Research	14	4	23	3.9	5.7	0.97
2021	Environment and Planning B: Urban Analytics and City Science	13	2	10	1.2	5.0	0.63
2023	Landscape Research	13	7	21	2.6	3.0	0.38
2020	Nexus Network Journal	12	4	23	3.5	5.7	0.87
2025	Npj Heritage Science	9	3	1	0.8	0.3	0.29
2022	Frontiers In Psychology	6	2	10	1.0	5.0	0.52
2024	Herd-Health Environments Research & Design Journal	6	2	1	0.3	0.5	0.17
2022	Landscape Architecture Frontiers	4	3	2	0.4	0.6	0.16
2024	Cultura-International Journal of Philosophy of Culture and Axiology	1	2	1	0.3	0.5	0.17
2023	Energy And Buildings	1	2	43	7.5	21.5	3.76

Note. Norm. Citation refers to a standardised citation indicator based on the average annual citation rate; Avg. Norm. Citation represents the average standardised citations per article
Source: Authors' own work

As shown in Table 3, the TLS / number of publications / number of citations / representative characteristics is as follows: China (168 / 169 / 668) occupies a central position in this field and plays a key role in international academic collaboration networks. Australia (52 / 11 / 55), Japan (43 / 9 / 26), the United Kingdom (28 / 7 / 27), and the Republic of Korea (21 / 6 / 36) exhibit differences in both scale and impact. Although Australia has a relatively small publication volume, it shows a comparatively high average citation rate (Avg. citation = 5.0), as well as a notable average normalised citation indicator (Avg. norm. citation = 0.92). Italy (4 / 1 / 8), despite its low publication volume, demonstrates a markedly elevated average normalised citation score (7.47). By contrast, the Netherlands (15 / 2 / 16), Wales

Table 3
Academic contributions at the national/regional level

Year	Countries/regions	Total Link Strength	Article Number	Citation Number	Norm Citation	Avg. Citation	Avg. Norm Citation
2020	China	168	169	668	134.7	3.9	0.81
2019	Australia	52	11	55	10.1	5.0	0.92
2023	Japan	43	9	26	5.0	2.8	0.56
2019	England	28	7	27	7.3	3.8	1.05
2019	South Korea	21	6	36	6.2	6.0	1.04
2023	Netherlands	15	2	16	3.9	8.0	1.99
2025	Wales	14	1	1	0.9	1.0	0.92
2017	Germany	13	4	4	0.4	1.0	0.1
2012	Canada	9	1	10	2.3	10	2.33
2024	Egypt	9	1	1	0.31	1.0	0.30
2025	Malaysia	5	2	2	1.8	1.0	0.92
2017	Italy	4	1	8	7.4	8.0	7.47
2024	France	2	1	2	0.6	2.0	0.60

Note. Norm. Citation refers to a standardised citation indicator based on the average annual citation rate; Avg. Norm. Citation represents the average standardised citations per article
Source: Authors' own work

(14 / 1 / 1), Germany (13 / 4 / 4), Canada (9 / 1 / 10), Egypt (9 / 1 / 1), Malaysia (5 / 2 / 2), and France (2 / 1 / 2) show comparatively modest citation scales and limited network connectivity, indicating potential for further development in terms of international visibility and research integration.

In terms of the geographical distribution of the case studies, research has primarily focused on Suzhou, Beijing, Nanjing, Hangzhou, and Chengdu. Despite differences in regional conditions, these gardens share common design principles, including drawing inspiration from nature, integrating mountains and water, and creating poetic and pictorial settings. Consequently, they exhibit similarities in spatial layout and aesthetic characteristics.

Highly Cited References Analysis

Through the analysis of highly cited literature using CiteSpace (Table 4), research on Chinese Traditional Gardens (CTGs) in the past five years has concentrated primarily on digital conservation, spatial reconstruction, and cultural heritage management. The prevailing research paradigm has shifted from traditional historical-interpretive analysis toward a technology-driven, interdisciplinary integration. The most frequently cited studies were largely published between 2019 and 2020. For example, Liang et al. (2018) and Liang et al. (2019) systematically examined three-dimensional scanning and digital printing technologies, marking a transition in the study of CTGs from visual

Table 4
Highly cited references analysis

Author	Journal Article Title	Source	Centrality	Count
Dong et al., 2020	3D scanning, modelling, and printing of Chinese classical garden rockeries: Zhanyuan's South Rockery.	Heritage Science	0.07	12
Liang et al., 2019	Semantic-based 3D information modelling and documentation of rockeries in Chinese classical gardens: A case study on the rockery at Huanxiu Shanzhuang, Suzhou, China.	Journal of Cultural Heritage	0.04	12
Liang et al., 2018	The integration of terrestrial laser scanning and terrestrial and unmanned aerial vehicle digital photogrammetry for the documentation of Chinese classical gardens—A case study of Huanxiu Shanzhuang, Suzhou, China.	Journal of Cultural Heritage	0.03	10
Liang et al., 2020	How to survey, model, and measure rockeries in a Chinese classical garden: a case study for Huanxiu Shanzhuang, Suzhou, China.	Landscape Research	0.10	10
Jia et al., 2022b	Methods of Conserving and Managing Cultural Heritage in Classical Chinese Royal Gardens Based on 3D digitalisation.	Sustainability	0.10	8
Jia et al., 2022a	Conservation and management of Chinese classical royal garden heritages based on 3D digitalisation — A case study of Jianxin courtyard in Jingyi garden in Fragrant Hills	Journal of Cultural Heritage	0.03	7
Guo et al., 2023	Digital Preservation of Du Fu Thatched Cottage Memorial Garden.	Sustainability	0.04	6
Ding et al., 2023	Fractal dimension-based analysis of rockery contour morphological characteristics for Chinese classical gardens south of the Yangtze River.	Journal of Asian Architecture and Building Engineering	0.01	5
Yang et al., 2023	Digital characterisation of the surface texture of Chinese classical garden rockery based on point cloud visualisation: small-rock mountain retreat.	Heritage Science	0.01	5
Chen & Yang, 2023	Analysis of Narrative Space in the Chinese Classical Garden Based on Narratology and Space Syntax—Taking the Humble Administrator's Garden as an Example.	Sustainability	0.04	4
Fu et al., 2023	A multi-criteria decision-making approach to assessing the health risk of rockeries in Chinese classical gardens.	Heritage Science	0.01	4
Xie et al., 2022	A preferred road to mental restoration in the Chinese classical garden.	Sustainability	0.04	4

Table 4 (*continued*)

Author	Journal Article Title	Source	Centrality	Count
Zhang, Wang, & Brown, 2021	The Charm of a Thousand Years': exploring tourists' perspectives of the 'culture–nature value' of the Humble Administrator's Garden, Suzhou, China.	Landscape Research	0.01	4
Zhang, Zhao, et al., 2021	Intelligent Recognition Method of Decorative Openwork Windows with Sustainable Application for Suzhou Traditional Private Gardens in China.	Sustainability	0.01	2
Zhang & Lian, 2021	Research on the Distribution and Scale Evolution of Suzhou Gardens under the Urbanisation Process from the Tang to the Qing Dynasty.	Land	0.01	2
Yan & Gong, 2023	The restoration design of the main building of "Huancui Hall" in Zuoyin Garden is based on graphics and text derivation.	Cogent Arts & Humanities	0.01	2
Shen & Yu, 2024	The virtual-real measurement of Chinese garden impression: A quantitative analysis of cognitive experience of Jiangnan gardens with virtual reality experiments.	Frontiers of Architectural Research	0.02	2

Source: Authors' own work

image documentation to three-dimensional information modelling. At the same time, Wang et al. (2020) further applied terrestrial laser scanning (TLS) and unmanned aerial vehicle (UAV) surveying to establish digital surveying and high-precision modelling frameworks for garden spaces, thereby providing a robust methodological foundation and technical pathway for subsequent work.

Since 2022, research priorities have increasingly shifted toward the digital conservation and management of imperial garden heritage, advancing pathways for dynamic management systems of cultural heritage and promoting the modernisation of conservation practices for historic palace gardens (Jia et al. 2022b). In recent years, scholars have further extended digital methodologies into the domains of spatial narrative and cultural expression. Yang et al. (2023) and Ding et al. (2023) conducted quantitative analysis of surface texture characteristics in rockeries, while Chen and Yang (2023) employed space syntax methods to examine the relationship between spatial configuration and aesthetic experience in Chinese Traditional Gardens (CTGs). These developments indicate a deepening integration from the technical dimension into the domain of cultural cognition.

Keyword and Burst Analysis

Keyword visualisation and clustering

Based on CiteSpace, this study visualised the keyword co-occurrence network for research on Chinese classical gardens (Figure 4). The results show an early focus on "Chinese

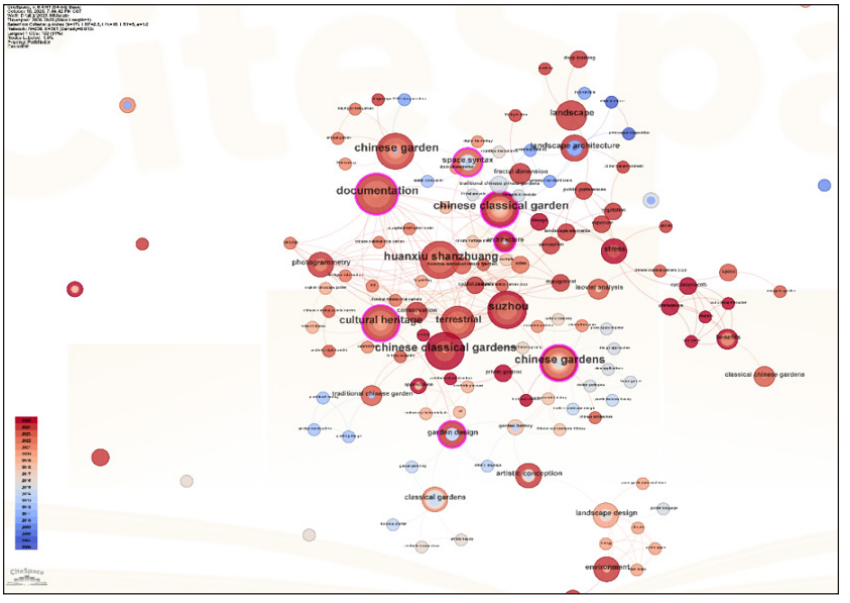

Figure 4. Keyword co-occurrence network map

classical garden," "cultural heritage," and "conservation." In addition, recently active keywords such as "stress," "benefits," and "environment" indicate that current research is expanding toward interdisciplinary areas that include environmental psychology and health values. Overall, keywords in this field efficiently capture essential information and research hotspots in the literature, and co-occurrence together with clustering forms of thematic groupings that can reveal future research challenges and development trajectories.

VOSviewer was used to quantitatively compare the network connectivity and citation influence of keywords. Among the 836 extracted keywords, 21 met the minimum occurrence threshold of 6 and were included in the analysis (Table 5).

The high-frequency keywords (occurrences ≥10)—including "landscape" (15), "documentation" (12), "Huanxiu Shanzhuang", "Suzhou" (12), "cultural heritage" (12), "Chinese classical gardens" (10), "Chinese garden" (10), and "space syntax" (10)—indicate that this field centers on Suzhou and focuses primarily on the conservation of cultural heritage and the analysis of spatial characteristics. Mid-frequency keywords (7 ≤ occurrences ≤ 9)—including "terrestrial" (8), "photogrammetry" (8), "conservation" (7), "rockery" (7), "environment" (7), and "garden" (8)—reflect a trend of increasing technological support for cultural heritage conservation. Low-frequency keywords (occurrences ≤ 6)—including "design" (6), "traditional Chinese garden" (6), "landscape architecture" (6), "space" (6), and "traditional Chinese private gardens" (5)—reveal trends toward interdisciplinary integration, greater refinement in the classification of objects

Table 5
Keyword clustering analysis based on VOSviewer

N	Year	Keywords	Total Link Strength	Occurrences	Avg. Citation	Avg. Norm Citation
1	2023	documentation	57	12	10.4	1.95
2	2022	huanxiu shanzhuang	57	12	16.0	2.19
3	2023	Suzhou	53	12	7.7	1.67
4	2022	terrestrial	37	8	13	2.15
5	2021	photogrammetry	35	8	24.3	2.84
6	2023	Chinese classical gardens	26	10	5.6	2.26
7	2019	landscape	25	15	4.9	1.62
9	2019	conservation	22	7	7.1	1.61
10	2022	rockery	20	7	9.2	1.68
11	2022	cultural heritage	18	12	8.4	1.39
12	2021	design	14	6	3.8	1.31
13	2019	traditional Chinese garden	12	6	6.3	0.80
14	2016	landscape architecture	11	6	2.3	1.00
15	2021	environment	9	7	8.4	1.38
16	2020	Chinese garden	8	10	1.7	0.43
17	2018	space syntax	7	10	5.1	1.68
18	2022	Space	5	6	2.1	0.63
19	2017	traditional Chinese private gardens	4	5	6.4	2.30
21	2021	garden	2	8	0.8	0.41

Note. TLS refers to the strength of co-occurrence links between keywords; Avg. Citation and Avg. Norm. Citation are used to indicate the academic impact associated with each keyword
Source: Authors' own work

of study, and increased terminological standardisation.

Keyword bursts

Burst strength is used to measure the academic growth of a given keyword within a specific period and is used to identify research areas that become particularly prominent during specific stages. Based on the burst visualisation generated by CiteSpace, this table presents 20 keywords (Table 6). "Keywords" denotes the burst terms; "Year" indicates the first year in which the keyword appeared; "Strength" refers to the burst strength; and "Begin" and "End" correspond to the starting and ending years of the burst period. On the right-hand side, blue bars indicate the overall time span during which the keyword was retrieved, whereas red bars indicate the duration of the burst period. A longer red bar together with a higher Strength value indicates that the topic received a higher level of attention during that period.

Table 6
High-intensity burst keywords in the research field, 2006-2025

Keywords	Year	Strength	Begin	End	2006 - 2025
landscape architecture	2007	1.75	2007	2010	
landscape planting	2010	1.17	2010	2013	
classic garden	2010	0.97	2010	2015	
space syntax	2012	1.28	2012	2015	
garden design	2013	1.05	2013	2014	
garden history	2013	0.85	2013	2018	
classical gardens	2014	1.53	2014	2016	
chinese gardens	2014	1.21	2014	2018	
landscape design	2015	1.69	2015	2020	
chinese classical garden	2010	0.96	2018	2021	
cultural heritage	2019	1.56	2019	2021	
chinese garden	2010	1.53	2021	2023	
documentation	2020	2.64	2022	2025	
suzhou	2022	2.34	2022	2025	
terrestrial	2022	2.11	2022	2025	
huanxiu shanzhuang	2018	1.92	2022	2025	
classical chinese gardens	2022	1.44	2022	2023	
photogrammetry	2022	1.19	2022	2025	

Source: Authors' own work

Timeline Analysis

The timeline visualisation is constructed on the basis of the keyword co-occurrence network and arranged according to the first year in which each keyword appears (Chen, 2006), providing an intuitive representation of the developmental process of research on CTGs. In this study, a timeline was generated using CiteSpace (Figure 5), Node size is proportional to the literature's co-citation frequency, and different studies correspond to different time periods. Accordingly, the analysis is organised into three-time spans below.

The time span for research on garden aesthetics and culture is from 2006 to 2015. During this period, scholarly outputs primarily focused on the aesthetic characteristics of gardens, philosophical thought, and metaphorical culture within traditional discourse, gradually establishing the disciplinary concepts and a research system of historical aesthetics in garden studies. This body of work provided a solid theoretical foundation for the subsequent adoption of space syntax, GIS, and point-cloud-based digital technologies, thereby fostering the sustainable development of the field in contemporary society.

The time span marking the field's methodological shift is 2016 to 2020, with studies largely centred on Suzhou private

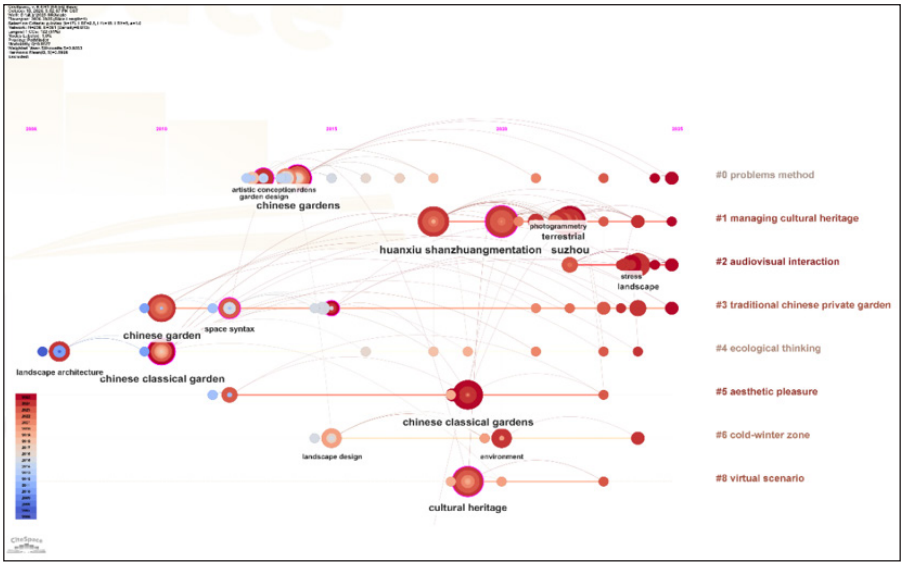

Figure 5. Timeline analysis

gardens. Photogrammetric scanning, three-dimensional modelling, laser scanning and surveying, and the integration of space syntax with GPS became the principal methodological tools during this period, indicating breakthrough progress in digitalisation at this stage.

The time frame for interdisciplinary integration is from 2021 to 2025. During this period, emerging keywords such a",stress," "environment," and "landscape" appear. New technologies are combined with environmental psychology and health benefits, and multimodality along with audiovisual interaction becomes a hot topic. This trend indicates a shift from single-focus spatial feature analysis to research on behavior and psychology, opening new avenues for investigating the therapeutic functions of garden environments.

Analysis of Research Themes

The analysis of research topics is based on co-citation clustering of literature. Citations serve as the cornerstone of literature co-citation analysis, whereby scholars employ references to substantiate their viewpoints, thereby generating new knowledge. The perpetual inter-citation of documents gives rise to a multitude of reference clusters, and the process of extracting multi-co-citation relationships within the literature network is designated as literature co-citation analysis. Based on the 203 included publications, this study constructed a literature co-citation network using CiteSpace and, employing the Log-Likelihood Ratio (LLR) algorithm, generated the literature co-citation map (Figure 6). The results show $Q = 0.8527$ and $S = 0.9363$, indicating that the clustering results exhibit significant

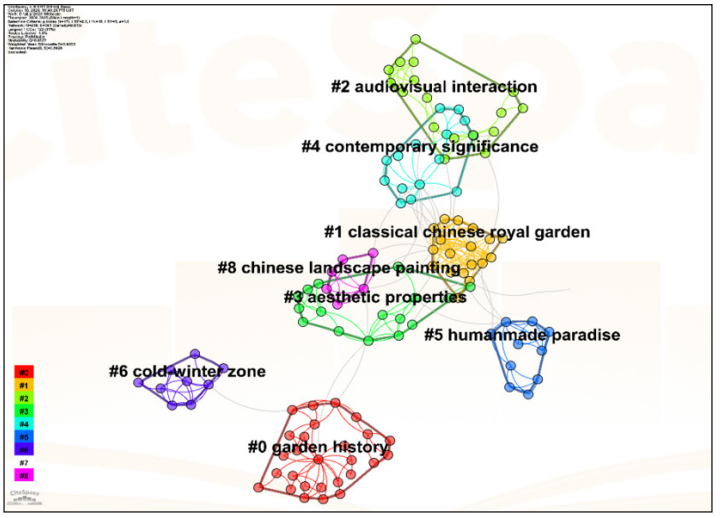

Figure 6. Document co-citation and cluster analysis

structural distinctiveness and high internal consistency.

To maintain the clarity of the clustering results, this study extracted only the eight clusters characterised by high citation counts and strong homogeneity, namely #0 garden history, #1 classical Chinese royal garden, #2 audiovisual interaction, #3 aesthetic properties, #5 contemporary significance, #6 humanmade paradise, #7 cold-winter zone, and #8 chinese landscape painting (Table 7). The five overarching themes were derived through a second-stage synthesis based on semantic similarity, the relationships among research objects, methodological commonalities, and temporal connections. Specifically, clusters #0, "garden history," and #5, "contemporary significance," both focus on the historical development, evolution, and present-day relevance of gardens and were therefore integrated into the theme "garden history and contemporary significance." Clusters #3, "aesthetic properties," and #6, "human-made paradise," emphasise the idealised representation of natural space in gardens and were combined into the theme "aesthetic properties and human-made paradise." Clusters #2, "audiovisual interaction," and #8, "Chinese landscape painting," concentrate on interactions between people and gardens through digital technologies and immersive sensory experiences and were grouped under the theme "audiovisual interaction and Chinese landscape painting." Cluster #1 independently represents the theme "classical Chinese royal garden." Cluster #7, "cold-winter zone," highlights the adaptability of traditional gardens to different climatic and regional conditions and was retained as the theme "cold-winter zone."

These five research themes reflect the overall trajectory of Chinese traditional garden studies and remain highly relevant to current scholarship. Garden history, aesthetic

Table 7
Document co-citation clusters

Cluster ID	Size	Silhouette	Mean(Year)	Label (LLR)
0	27	0.982	2016	garden history
1	18	0.832	2022	classical chinese royal garden
2	17	0.990	2024	audiovisual interaction
3	16	0.939	2020	aesthetic properties
5	15	0.812	2014	contemporary significance
6	10	0.977	2016	humanmade paradise
7	9	0.993	2019	cold-winter zone
8	6	1	2020	chinese landscape painting

Source: Authors' own work

characteristics, and the conservation of royal gardens continue to constitute core research areas. Audiovisual interaction represents an emerging trend integrating digital technologies with environmental perception, while research on cold-winter regions indicates a potential expansion of the field toward climate adaptation and regional specificity.

Challenges and Future Development

We analyse five themes to provide an evidentiary basis for identifying research gaps and determining priorities for future research. Table 8 synthesises the principal challenges and future development trends across these five themes, providing a reference and guide for subsequent scholarly inquiry. The following subsections elaborate on each theme in turn.

1. Garden history and contemporary significance: Current research in this thematic area remains predominantly descriptive and grounded in art-historical narration, with a clear lack of quantitative and systematic spatiotemporal comparison. The lack of quantitative and hybrid research methods has hindered the development of contemporary urban landscapes. To address these limitations, future studies should not only incorporate GIS and spatial narrative approaches but also establish digitised historical knowledge bases and cultural evolution models, thereby moving toward standardised and replicable research workflows.
2. Aesthetic properties and humanmade paradise: Research in this thematic area has long relied on aesthetic theory and experiential interpretation, making it difficult to quantitatively measure visitors' aesthetic experience and hindering the establishment of standardised criteria for historical value. Future research may incorporate GPS tracking, eye-tracking, and EEG experiments, together with behavioral trajectory modelling of aesthetic experience, to achieve quantitative assessment of aesthetic responses. At the same time, by linking spatial layout

with aesthetic experience, such work can generate verifiable data to inform garden design.

3. Audiovisual interaction and Chinese landscape painting: At present, there is insufficient precise alignment between the compositional logic of Chinese landscape painting and multimodal audiovisual interaction data, and experimental reproducibility remains relatively weak. Future development should establish standardised multimodal experimental systems and open, shareable datasets, and further promote cross-institutional collaboration and data sharing in order to enhance the scientific rigor and reproducibility of research in this area.
4. Classical Chinese Royal Garden: An inherent conflict exists between authenticity-oriented conservation and revitalisation-oriented use; future research should employ minimal-intervention technologies and digital reconstruction methods to achieve a balance between protection and revitalisation, encourage new forms of civic participation, and enhance social value and functions.
5. Cold-Winter Zone: Cold-winter zone: The current theme lacks specific design for regional climate. Future research needs to be combined with regional culture and climate to improve the sustainable development of regional gardens.

CONCLUSION

Traditional Chinese gardens, as one of the most significant cultural heritages, are not merely a form of landscape but also a vital vehicle for conveying traditional Chinese philosophy, culture, and aesthetic sensibilities. To elucidate the present status and developmental trajectory of traditional Chinese gardens and to define future directions, this study employs CiteSpace and VOSviewer tools to conduct a bibliometric analysis of the field. From the perspective of publication volume, the field is in a phase of sustained growth. Publishing venues are concentrated in cultural heritage, architecture, landscape, and interdisciplinary outlets, while the geographic distribution of publications is centred in East Asia, as well as Australia and the United Kingdom. These patterns indicate a gradual shift from traditional theoretical inquiry toward interdisciplinary integration, alongside an expansion of the contributing research community from East Asia outward. In addition, analyses of highly cited literature, keyword bursts, and document co-citation clustering indicate that research on Chinese traditional gardens is primarily organised around five themes: garden history and contemporary significance, aesthetic properties and humanmade paradise, audiovisual interaction and Chinese landscape painting, classical Chinese royal garden, and cold-winter zone. Current research on Chinese traditional gardens (CTGs) remains heavily grounded in art history, aesthetic theory, and

Table 8
Research themes, challenges, and future research trends

Research Themes	Cluster Mean Year(s)	Challenges	Future Research Trends
Garden history and contemporary significance	2014, 2016	Historical sources are fragmented, terminology is not standardised, and spatiotemporal validation is lacking, making it difficult to form a unified evaluation	Develop evaluation models supported by historical GIS-based spatiotemporal analysis
Aesthetic properties and humanmade paradise	2016, 2020	Aesthetic concepts are abstract, and there is a lack of scientifically measurable evaluation systems	Introduce eye-tracking and EEG-based aesthetic experiments; model behavioral trajectories of aesthetic experience
Audiovisual interaction and Chinese landscape painting	2020, 2024	Comparable empirical evidence linking audiovisual interaction and the compositional logic of Chinese landscape painting remains weak, and findings are difficult to reproduce	Establish standardised multimodal experimental frameworks and open-source datasets
Classical Chinese royal garden	2022	Tension between authenticity-oriented conservation and adaptive reuse	Apply quantitative authenticity management and minimal-intervention techniques
Cold-winter zone	2019	Insufficient ecological resilience and high maintenance costs	Enhance cold-resistant ecological systems and develop low-maintenance technical strategies

Source: Authors' own work

empirical inquiry. Although interdisciplinary approaches have begun to emerge, the application of advanced methodologies—such as audiovisual interaction, digital modelling, and experiment-based analyses—remains limited. Moreover, tensions persist between authenticity-oriented conservation and adaptive reuse. In sum, research on CTGs is still in an ascendant phase with substantial room for growth. Future efforts should continue to advance theoretical research, practice-oriented exploration, and methodological innovation, integrating multidisciplinary perspectives to foster sustained development of the field.

LIMITATIONS

This study relied primarily on the Web of Science platform. Although the platform is authoritative and widely representative—and the search strategy sought to comprehensively cover all relevant keywords—it does not fully capture

literature published in other languages. Given the regional specificity of Chinese traditional gardens, a substantial body of relevant research remains in Chinese-language databases. To address these limitations, future studies should implement comprehensive, systematic searches across multiple databases and multiple languages to enhance the completeness and representativeness of the evidence base.

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REFERENCES

Chen, C. (2006). CiteSpace II: Detecting and visualizing emerging trends and transient patterns in scientific literature. *Journal of the American Society for Information Science and Technology, 57*(3), 359-377. https://doi.org/10.1002/asi.20317

Chen, H., & Yang, L. (2023). Analysis of narrative space in the Chinese classical garden based on narratology and space syntax—Taking the Humble Administrator's Garden as an example. *Sustainability, 15*(16), Article 12232. https://doi.org/10.3390/su151612232

Cooper, D. E. (2017). Gardens, nature and culture. *Journal of Scottish Thought, 9*(1), 1-12. https://doi.org/10.57132/jst.36

Ding, M., Zhang, Q., Li, G., Li, W., Chen, F., Wang, Y., Li, Q., Qu, Z., & Fu, L. (2023). Fractal dimension-based analysis of rockery contour morphological characteristics for Chinese classical gardens south of the Yangtze River. *Journal of Asian Architecture and Building Engineering, 22*(5), 2490-2505. https://doi.org/10.1080/13467581.2022.2160205

Dong, Q., Zhang, Q., & Zhu, L. (2020). 3D scanning, modelling, and printing of Chinese classical garden rockeries: Zhanyuan's South Rockery. *Heritage Science, 8*, Article 61. https://doi.org/10.1186/s40494-020-00405-z

Feng, C., & Fan, Y. (Eds.). (2007). *The classical gardens of Suzhou*. New World Press.

Fu, L., Pan, J., Tang, Y., & Zhang, Q. (2023). A multi-criteria decision-making approach to assessing the health risk of rockeries in Chinese classical gardens. *Heritage Science, 11*, Article 92. https://doi.org/10.1186/s40494-023-00926-3

Garfield, E. (1955). Citation indexes for science: A new dimension in documentation through association of ideas. *Science, 122*(3159), 108-111. https://doi.org/10.1126/science.122.3159.108

Gholinejad Pirbazar, A., Khakzand, M., & Kiani, K. (2021). A search in the traditional gardens of Iran and China with an analytical-historical perspective. *Athar, 42*(1), 40-61. https://doi.org/10.30699/athar.42.1.40

Guo, L., Xu, J., Li, J., & Zhu, Z. (2023). Digital preservation of Du Fu Thatched Cottage Memorial Garden. *Sustainability, 15*(2), Article 1359. https://doi.org/10.3390/su15021359

Hall, D. L., & Ames, R. T. (1987). *Thinking through Confucius*. State University of New York Press.

Huang, J. (2008). Modern design application of Chinese traditional gardening theory of "man living in harmony with nature." In *2008 9th International Conference on Computer-Aided Industrial Design and Conceptual Design* (pp. 1345-1348). IEEE. https://doi.org/10.1109/CAIDCD.2008.4730813

Hunt, J. D. (1992). *Gardens and the picturesque: Studies in the history of landscape architecture*. MIT Press.

ICOMOS, I. (1982). Historic gardens (the Florence charter 1981). Paris: International Council on Monuments and Sites.

Jia, S., Liao, Y., Xiao, Y., Zhang, B., Meng, X., & Qin, K. (2022a). Conservation and management of Chinese classical royal garden heritages based on 3D digitalization: A case study of Jianxin Courtyard in Jingyi Garden in Fragrant Hills. *Journal of Cultural Heritage, 58*, 102–111. https://doi.org/10.1016/j.culher.2022.09.020

Jia, S., Liao, Y., Xiao, Y., Zhang, B., Meng, X., & Qin, K. (2022b). Methods of conserving and managing cultural heritage in classical Chinese royal gardens based on 3D digitalization. *Sustainability, 14*(7), Article 4108. https://doi.org/10.3390/su14074108

Keswick, M. (2003). *The Chinese garden: History, art, and architecture* (A. Hardie, Rev.). Harvard University Press.

Kiani, K., & Khakzand, M. (2024). The structure, concept and identity of traditional Chinese gardens. *Landscape History, 45*(2), 101-120. https://doi.org/10.1080/01433768.2024.2407194

Li, S. (2012). *The Chinese traditional garden and its influence on Western gardens* [Master's thesis, Swedish University of Agricultural Sciences]. Epsilon Archive for Student Projects. https://stud.epsilon.slu.se/4010/

Liang, H., Li, W., Lai, S., Jiang, W., Zhu, L., & Zhang, Q. (2018). The integration of terrestrial laser scanning and terrestrial and unmanned aerial vehicle digital photogrammetry for the documentation of Chinese classical gardens: A case study of Huanxiu Shanzhuang, Suzhou, China. *Journal of Cultural Heritage, 33*, 222-230. https://doi.org/10.1016/j.culher.2018.03.004

Liang, H., Li, W., & Zhang, Q. (2019). Semantic-based 3D information modelling and documentation of rockeries in Chinese classical gardens: A case study on the rockery at Huanxiu Shanzhuang, Suzhou, China. *Journal of Cultural Heritage, 37*, 247-258. https://doi.org/10.1016/j.culher.2018.11.015

Liang, H., Li, W., Lai, S., Jiang, W., Zhu, L., & Zhang, Q. (2020). How to survey, model, and measure rockeries in a Chinese classical garden: A case study for Huanxiu Shanzhuang, Suzhou, China. *Landscape Research, 45*(3), 377-391. https://doi.org/10.1080/01426397.2019.1632276

Liu, T. (2012). *Classical gardens in China* (M. Qiu, Trans.). Better Link Press.

Munn, Z., Aromataris, E., Tufanaru, C., Stern, C., Porritt, K., Farrow, J., Lockwood, C., Stephenson, M., Moola, S., Lizarondo, L., McArthur, A., Peters, M., Pearson, A., & Jordan, Z. (2019). The development of software to support multiple systematic review types: The Joanna Briggs Institute System for the Unified Management, Assessment and Review of Information (JBI SUMARI). *International Journal of Evidence-Based Healthcare, 17*(1), 36-43. https://doi.org/10.1097/XEB.0000000000000152

Needham, J. (1974). *Science and civilisation in China* (Vol. 5). Cambridge University Press.

Orlenko, M., Ivashko, Y., Chang, P., Ding, Y., Krupa, M., Kuśnierz, K., & Sandu, I. G. (2021). The specificity of the restoration and monument protective measures for the preservation of historical Chinese gardens. *International Journal of Conservation Science, 12*(3), 1003-1026. https://ijcs.ro/public/IJCS-21-74_Orlenko.pdf

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., … Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ, 372*, Article n71. https://doi.org/10.1136/bmj.n71

Rinaldi, B. M. (2012). *The Chinese garden: Garden types for contemporary landscape*

architecture. Walter de Gruyter. https://doi.org/10.1515/9783034610650

Scazzosi, L. (2004). Reading and assessing the landscape as cultural and historical heritage. *Landscape Research, 29*(4), 335-355. https://doi.org/10.1080/0142639042000288993

Shen, C., & Yu, C. (2024). The virtual-real measurement of Chinese garden impression: A quantitative analysis of cognitive experience of Jiangnan gardens with virtual reality experiments. *Frontiers of Architectural Research, 13*(4), 895-911. https://doi.org/10.1016/j.foar.2024.02.007

Small, H. (1973). Co-citation in the scientific literature: A new measure of the relationship between two documents. *Journal of the American Society for Information Science, 24*(4), 265-269. https://doi.org/10.1002/asi.4630240406

Thacker, C. (1985). *The history of gardens*. University of California Press.

Tsu, F. Y.-S. (1988). *Landscape design in Chinese gardens*. McGraw-Hill.

van Eck, N. J., & Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics, 84*(2), 523-538. https://doi.org/10.1007/s11192-009-0146-3

Wang, Y. (2015). *A cultural history of classical Chinese gardens*. SCPG Publishing Corporation. https://doi.org/10.1142/z005

Wu, H., Jin, H., & Zheng, Q. (2020). The functions and aesthetic meaning of water scenes in Chinese temple gardens. In F. Wang & M. Prominski (Eds.), *Water-related urbanisation and locality: Protecting, planning and designing urban water environments in a sustainable way* (pp. 317-339). Springer. https://doi.org/10.1007/978-981-15-3507-9_17

Xia, X., & Zhou, J. (2024). Urban design and Chinese culture spirit: The symbolic significance of mountain factors in shaping cultural park. *Trans/Form/Ação, 47*(5), Article e02400179. https://doi.org/10.1590/0101-3173.2024.v47.n5.e02400179

Xie, J., Luo, S., Furuya, K., Kagawa, T., & Yang, M. (2022). A preferred road to mental restoration in the Chinese classical garden. *Sustainability, 14*(8), Article 4422. https://doi.org/10.3390/su14084422

Xu, Y., Burley, J. B., Machemer, P., & Allen, A. (2016). A dimensional comparison between classical Chinese gardens and modern Chinese gardens. *WSEAS Transactions on Environment and Development, 12*, 200-213. https://www.wseas.org/multimedia/journals/environment/2016/a405811-168.pdf

Yang, C., Han, X., Wu, H., Han, F., Wei, C., & Shutter, L. (2023). Digital characterization of the surface texture of Chinese classical garden rockery based on point cloud visualization: Small-rock mountain retreat. *Heritage Science, 11*, Article 13. https://doi.org/10.1186/s40494-022-00851-x

Zhang, Q., & Mohd Nasir, N. B. (2025). Spatial creation of "yi" and "xiang": The aesthetic appreciation of imagery in Chinese classical garden art. In *Proceedings of the 2025 4th International Conference on Science Education and Art Appreciation (SEAA 2025)* (pp. 334-343). Atlantis Press. https://doi.org/10.2991/978-2-38476-452-5_43

Zhang, R., Wang, J., & Brown, S. (2021). The charm of a thousand years: Exploring tourists' perspectives of the culture–nature value of the Humble Administrator's Garden, Suzhou, China. *Landscape Research, 46*(8), 1071-1088. https://doi.org/10.1080/01426397.2021.1940904

Zhang, R., Zhao, Y., Kong, J., Cheng, C., Liu, X., & Zhang, C. (2021). Intelligent recognition method of decorative openwork windows with sustainable application for Suzhou traditional

private gardens in China. *Sustainability, 13*(15), Article 8439. https://doi.org/10.3390/su13158439

Zhang, T., & Lian, Z. (2021). Research on the distribution and scale evolution of Suzhou gardens under the urbanization process from the Tang to the Qing Dynasty. *Land, 10*(3), Article 281. https://doi.org/10.3390/land10030281

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Reducing English-Speaking Anxiety and Enhancing Speaking Performance Through a Story Cube Intervention: A Quasi-Experimental Study

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ABSTRACT

Anxiety when speaking English among second language speakers is an ongoing issue in the ESL classroom. It has become a top priority for ESL teachers to find solutions to this issue, and this can be done through pedagogical interventions that aim to reduce anxiety and promote meaningful communication. This study employs a quasi-experimental design to examine the effectiveness of the Story Cube intervention. The pre-test–post-test control group design involved 120 secondary school students. An instrument that combined the English-speaking anxiety scale with an analytic speaking performance rubric assessing fluency, pronunciation, vocabulary, grammatical accuracy, and coherence was used to collect data. The analysis of covariance (ANCOVA) was used to analyse post-test outcomes while controlling for pre-test differences. The findings showed that students exposed to the Story Cube intervention experienced a statistically significant reduction in English-speaking anxiety and achieved significantly higher speaking performance scores than those receiving conventional instruction. This study implies that game-based storytelling activities can be integrated into classroom pedagogy through interventions that create affective-sensitive ESL classroom learning.

Keywords: English-speaking anxiety, ESL learners, game-based storytelling, quasi-experimental study, speaking performance, Story Cube intervention

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INTRODUCTION

Speaking English has been the most important communication skill for individuals for centuries now. Since the earliest era of industrialisation, driven by the British policy of colonisation, English has been the primary language of communication worldwide. For people around the world, English quickly became their second language as British colonialism expanded. Today, English is a second language for most people around the world, and the development of English-speaking skills for students who are second-language speakers has become an important point of discussion. Extensive research has been conducted on the development of ESL and the various aspects of ESL teaching and learning. Despite centuries of exposure to English, new second-language speakers continue to struggle to learn and use the language, especially in speaking. Speaking English has always been a concern for second-language learners due to the issues surrounding it.

Anxiety when speaking in the English language is an issue that has been researched substantially around the world. Studies have shown that English language speaking anxiety is a primary hindrance to effective oral communication. At the same time, ongoing research has shown that more research is required because English-language speaking anxiety is related to contextual factors that vary across communities, societies, and even individuals. Speaking anxiety is closely associated with learners' willingness to communicate, as psychological, social, pedagogical, and contextual factors may either facilitate or inhibit their readiness to use the target language (Shanmugan et al., 2025; Subramaniam et al., 2026). Affective variables, as mentioned in Alrabai (2020), are elements of concern when it comes to understanding speaking anxiety among second language learners. Studies like Zhang and Tsung (2021) have recorded how speaking anxiety can be related to fear, which can be broken down into fear of being judged and fear of embarrassment. Mustapha and Uri (2024) described speaking anxiety as the common factor behind students' lower fluency and accuracy in English.

Subsequently, research in second language anxiety has further expanded into findings that are related to impacts on students' emotional well-being and overall language achievement. Continued anxiety when speaking in English has significant effects on students' self-confidence in the classroom (Botes et al., 2020; Teimouri et al., 2022). Additionally, it affects students' learning experiences, leading to negative motivation in the classroom (Badrasawi, Solihu & Ahmad, 2020). More research also uncovered how continued anxiety results in effects on cognitive processing during speech production (Badrasawi et al, 2020). These adverse effects of speaking anxiety have driven research towards finding viable solutions for ESL learners who struggle with speaking in the English language. It has spurred research in contemporary language pedagogy that focuses on alternative and modern techniques for ESL teaching and learning.

Using games, for example, has become a trend in recent years because research has shown that classroom games can help students manage their anxieties. Likewise, student-centred activities, particularly interactive ones, have been shown to help learners acknowledge their anxiety and become more confident when speaking English (Phan & Phan, 2024). Contemporary teaching methods have also encouraged the infusion of storytelling as an interesting and effective technique in the ESL classroom. Storytelling can be traced back to the earliest stages of the evolution of the English language, and ever since, it has been a popular way of teaching many things (Ghafar, 2024). From a storytelling perspective, students are positioned as active constructors of learning, making them more responsible for their participation and more confident when speaking in English.

The Story Cube intervention is a tool that combines multiple elements of contemporary teaching and learning. Essentially, it is a tool designed to help students struggling with anxiety when speaking English. It is a game-based intervention that uses the storytelling technique as a basis to promote effective communication. Additionally, the Story Cube intervention is designed to encourage creative storytelling by eliminating the usual negative evaluation and potential embarrassment that some students may experience when speaking in a second language. Creativity, which is the focus of the Story Cube intervention, helps students reduce unnecessary emphasis and stress when speaking English.

Exploring the current literature related to English-speaking anxiety among second language learners, several significant limitations must be acknowledged. There is sufficient research addressing the relationships between various affective variables and speaking performance (Subramaniam et al., 2026). However, few studies have explored interventions and experiments with pedagogical innovations to improve the affective elements related to speaking skills (Teimouri et al., 2022). More research is required to explore how interventions can be developed and utilised for the specific purpose of helping second language learners with English speaking anxiety. The current study addresses the gaps in the literature by examining the effects of using the Story Cube intervention.

English-Speaking Anxiety in Second Language Learning

Anxiety in second-language learning, especially when speaking in English, has been widely documented in past studies such as Höl and Kasımi (2022), Tran (2022), and Kiruthiga and Christopher (2022). Tran (2022) indicated that anxiety in speaking stems from various factors, including an individual's past experiences, content knowledge, grammatical knowledge, confidence, and culture. Kiruthiga and Christopher (2022) added that anxiety and the factors that cause anxiety ultimately cause avoidance behaviours and reduced willingness to communicate in the target language. Furthermore, Xue and Noels

(2025) have stated that, in some cases, speaking anxiety is not necessarily related to low-proficiency learners, as research has shown that students with good grammatical and lexical knowledge sometimes experience increased anxiety in speaking situations.

Nevertheless, studies over the last five years have provided strong evidence that second language anxiety affects learners' overall speaking achievement. Botes et al (2020) stated that anxiety causes a significant impact on the student's emotional elements, and this, in turn, affects oral language development. These studies point to the importance of ongoing exploration of English-speaking anxiety and further emphasise the need for the current study using the Story Cube intervention.

Relationship Between Speaking Anxiety and Speaking Performance

Research has extensively proven the relationship between speaking anxiety and speaking performance. Findings have pointed out that anxiety interferes with speech production when cognitive load is increased due to anxiety (Pike & Raymundo, 2024). When an individual experiences cognitive load, speech is impeded, resulting in stuttering and long pauses that can adversely affect communication (Ismail et al., 2023). Ismail et al. (2023) further explained that students' anxiety when speaking English causes additional issues, especially regarding continued language learning and language development.

There is enough evidence in the most recent studies to support the fact that speaking anxiety can be managed through activities that address the emotional factors caused by anxiety. The interactionist theory is a basis for understanding the works of the Story Cube. This is because the Story Cube is very useful for encouraging and promoting interactions. The interactionist's point of view on this matter must be taken into consideration because, from this perspective, reduced anxiety in speaking can improve the learner's fluency and overall oral performance (Derakhshan et al., 2022; Kruk et al., 2022). However, most current studies have not explored further into the experimentation of classroom interventions that can reduce anxiety and increase oral output.

Task-Based, Game-Based, and Storytelling Approaches in Speaking Instruction

Teaching speaking skills has evolved, gradually shifting from a traditional perspective to a more contemporary one. Contemporary ideologies have driven research on game-based learning approaches and task-based instructions for speaking skills (Lim et al., 2022). Results have been positive, especially when studies explored the use of games integrating non-conventional speaking tasks. It has been shown that meaningful interactions arising when lessons indirectly foster learner autonomy yield better language outcomes.

Storytelling approaches are effective for creating task-based interactive activities because they can be easily adapted into a variety of activities. Storytelling

is not only associated with the creative process but is also significantly related to meaning-making, collaborative thinking, and authentic language use (Nguyen & Newton, 2020). Storytelling is also a very prominent component of culture, especially in cultures of second-language speakers, which gives it the additional advantage of fostering language use. Teachers can create a multitude of tasks from storytelling activities that focus on the transfer of information, ideas, and meaning, and eventually eliminate anxiety.

According to Kruk et al. (2022), game-based learning using storytelling can be a highly effective way to reduce affective factors that increase anxiety when students speak in a second language. Games are effective in enhancing learner engagement and creating a playful, collaborative environment among younger learners (Kayi-Aydar, 2021). Activities that involve playful and collaborative tasks eventually help learners reduce their anxiety and increase their willingness to speak in the second language (Tabari et al., 2024). Storytelling ultimately embeds learning of second-language components and fosters effective language learning (Tabari et al., 2024).

Story Cube Intervention and Identified Research Gaps

The Story Cube's physical components include visual prompts in the form of a cube. Each side of the Story Cube has a visual prompt that the learner can use to describe verbally. It is generally intended for small groups of three to four students, in which the Story Cube is used for collaborative storytelling. The process of using the Story Cube reflects the underlying principles of affective-sensitive pedagogy which has become the focus in recent SLA research. The ideas of affective-sensitive pedagogy stem from ongoing research and exploration into the anxiety experienced by second-language learners. A deeper understanding of the emotional setbacks and adverse effects on the overall language development of learners has brought about awareness of affective-sensitive pedagogy.

Upon evaluating past research, it can be summarised that most studies provide results based on single variables, such as learner motivation, fluency, and oral outcome (Tabari et al., 2024; Lee et al., 2022). There has been less emphasis on a holistic variable that reflects the affective factors associated with anxiety in speaking English. This further emphasises the need for the current study, in which the Story Cube is tested using experimental methods, and the effects of the intervention on affective elements in the classroom are examined.

This research is vital in an environment where anxiety in the SLA classroom is becoming a critical barrier to better learning. Experimenting with an intervention like Story Cube yields results that can partially address questions about the anxiety learners experience when speaking English. It provides a design and methodology for future studies that should further develop the use of the Story Cube in classroom settings.

Summary and Research Gap

Review of past literature has further proven that English-speaking anxiety is a recurring issue in the SLA classroom. Past studies have reported that the phenomenon obstructs oral performance and, in the long run, impacts a student's overall academic achievement. However, gaps persist and require robust research to address. An obvious gap in the literature is the scarcity of studies that explore the in-depth interrelationship between anxiety and speaking performance. Furthermore, studies have not fully explored interventions that address anxiety in speaking and the relationship with affective elements, as well as speaking performance. Most importantly, there is little empirical evidence examining the integration of storytelling and game-based interventions.

METHODOLOGY

Research Design

A quasi-experimental design using pre- and post-tests with controlled and experimental groups is employed. The design is chosen for its suitability to the aims of the current study. The quasi-experimental design is a popular approach in educational research, allowing for causal inference (Creswell & Guetterman, 2021). The use of the pre-tests and post-tests allowed the researcher to evaluate baseline differences between groups.

Participants

120 ESL students at a secondary school in Malaysia were participants of the study. These are students of two intact classes. Essentially, this study employed purposive sampling. Relying on intact classes may affect the results, since students may have existing dynamics, relationships, and experiences. The existing dynamics and relationships between students in each class may affect the anxiety levels. Still, each student is subjected some level of anxiety when speaking in the second language depending on the level of speaking required.

To ensure that both groups, the controlled group (n=60) and the experimental group (n=60), were at a similar level of English proficiency, a pre-test was conducted. The results showed no significant differences at baseline. In terms of ethical approvals, all relevant permissions from the relevant authorities, including the school headmaster, were obtained. Informed consent was also obtained from students and their guardians. The researcher ensured that confidentiality was maintained throughout the study.

Instruments

English-Speaking Anxiety Scale

A survey questionnaire adapted from foreign language anxiety instruments previously developed and used in past studies was utilised as the instrument to evaluate the English-speaking anxiety. The instrument encompasses the different dimensions of speaking anxiety, which include embarrassment, fear of negative evaluation, and apprehension, as well as avoidance in the classroom context. The five-point Likert scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*),

was used in the instrument. The Cronbach's alpha analysis was conducted to assess internal consistency, and the results showed that the instrument's alpha coefficient exceeded the recommended threshold of .70, indicating acceptable internal consistency (Taber, 2020).

Speaking Performance Assessment

Students' speaking performance was assessed using an analytic speaking rubric that evaluated five dimensions: fluency, pronunciation, vocabulary use, grammatical accuracy, and coherence. Analytic rubrics are recommended for speaking assessment as they provide detailed diagnostic information and enhance scoring reliability by reducing rater subjectivity (Knoch & Chapelle, 2021). Two trained raters were appointed to evaluate students' oral performances based on audio-recorded speaking tasks. The raters went through the deliberation process before the evaluation to calibrate the instruments.

Intervention Procedure

The intervention period was set at twelve weeks. The experimental group participated in the intervention using the Story Cube-based speaking activities. Throughout the activities, students engaged in collaborative storytelling, using visual prompts to inspire creative storytelling. On the other hand, the control group students participated in conventional classroom teaching and learning. In the control group, speaking activities were mostly textbook-based. The teacher used the materials to conduct speaking lessons in a more controlled manner. For future replicability, it is recommended that teachers use the Story Cube intervention for at least 12 weeks. It can be combined with activities such as discussion of the storyboard, short sketches, and team games.

Data Collection Procedure

Data collection was conducted by first administering pretests to assess the students' English-speaking anxiety and speaking performance in both groups. Following that, the intervention was conducted with the experimental group, while the control group received conventional instruction. Post-tests were conducted using the same instruments to assess the changes in the anxiety levels and speaking performance.

Data Analysis

Analysis of Covariance (ANCOVA) was used to analyse the comparison of post-test scores between the groups. The ANCOVA was used because it is well-suited to the quasi-experimental design.

Methodological Rigor

Some important steps were taken to ensure the methodological rigor in the current study. The teachers who taught the two groups were thoroughly trained and briefed on the study. This was done to ensure that different teacher behaviours, such as a warmer tone and an encouraging manner, would not affect the study's results. The study duration, lessons taught, lesson content, and assessment procedures were precisely

standardised. This is to ensure that the results remain valid and accurate between the two groups without any interference of external factors.

RESULTS

Table 1 shows the descriptive analysis of the data collected for speaking anxiety and speaking performance. The results are reported based on the experimental and control group of the current study. The pre-test and post-test mean of both groups are recorded. For the English-speaking anxiety, the experimental group scored a higher mean score (3.743±.599) at the pre-test compared to the post-test (2.789±.460). Meanwhile, the controlled group scored (3.649±.359) in the pre-test and (3.478±.590) in the post-test. In terms of the speaking performance, the experimental group scored higher (3.379±1.293) in the post-test compared to the results in the pre-test (2.412±.472). The controlled group scored (2.389±.507) in the pre-test and (2.898±.472) in the post-test.

Effect of the Story Cube Intervention on English-Speaking Anxiety

An ANCOVA analysis was conducted to further analyse the effects of the story cube intervention. Table 2 shows the results

Table 1
Descriptive Statistics for English-Speaking Anxiety and Speaking Performance

Variable	Group	Pre-test Mean (SD)	Post-test Mean (SD)
English-speaking anxiety	Experimental	3.743 (.599)	2.789 (.460)
	Control	3.649 (.359)	3.478 (.590)
Speaking performance	Experimental	2.412 (.472)	3.379 (.293)
	Control	2.389 (.507)	2.898 (.472)

Note. Experimental group = Story Cube intervention; Control group = conventional classroom practices

Table 2
ANCOVA analysis for English-Speaking Anxiety

Tests of Between-Subjects Effects						
Dependent Variable: Post						
Source	**Type III Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**	**Partial Eta Squared**
Corrected Model	13.345a	2	6.672	26.513	.000	.482
Intercept	1.849	1	1.849	7.348	.009	.114
Pre	6.134	1	6.134	24.373	.000	.300
Group	6.418	1	6.418	25.502	.000	.309
Error	14.345	57	.252			
Total	719.930	60				
Corrected Total	27.689	59				

a. R Squared = .482 (Adjusted R Squared = .464)

of the one-way ANCOVA. The analysis showed that there is an overall statistically significant difference in post-intervention results between experimental and controlled groups once their means are adjusted for pre-test results. The p-value (<.0005) shows that the difference is statistically significant.

Effect of the Story Cube Intervention on Speaking Performance

An ANCOVA analysis was conducted to further analyse the effects of the story cube intervention. Table 3 shows the results of the one-way ANCOVA. The analysis showed that there is an overall statistically significant difference in post-intervention results between experimental and controlled groups once their means are adjusted for pre-test results. The p-value (<.0005) shows that the difference is statistically significant.

Summary of Findings

The analysis showed that the Story Cube intervention had a statistically significant effect on the English-speaking anxiety and speaking performance of the students in the experimental group. As opposed to that, the students in the controlled group who went through conventional lessons did not show significant changes in terms of anxiety and speaking performances.

DISCUSSION

The effectiveness of the Story Cube intervention was examined in this study. The results showed that students in the experimental group who took part in the intervention with the Story Cube experienced significant reduction in terms of speaking anxiety. Post-tests also showed improvements in terms of speaking performances. Every result in this study has been further discussed as below.

Effect of the Story Cube Intervention on English-Speaking Anxiety

The Story Cube intervention caused significant reduction in anxiety among

Table 3
ANCOVA analysis for English-Speaking Perfomance

Tests of Between-Subjects Effects						
Dependent Variable: SPPost						
Source	**Type III Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**	**Partial Eta Squared**
Corrected Model	36.656a	2	18.328	32.378	.000	.532
Intercept	.002	1	.002	.004	.948	.000
SPPre	22.640	1	22.640	39.994	.000	.412
Group	6.259	1	6.259	11.057	.002	.162
Error	32.266	57	.566			
Total	571.942	60				
Corrected Total	68.923	59				

a. R Squared = .532 (Adjusted R Squared = .515)

students in the experimental group. This can be attributed to the design of the Story Cube intervention and the procedures used throughout the lessons during the intervention because students in the controlled group went through lessons focusing on speaking activities without the Story Cube but it failed to help students reduce the anxiety felt. This result aligns with the findings recorded in past studies which found that activities that promote affective sensitive instructional techniques can reduce students' anxiety when they speak in the second language (Lim et al., 2022). Additionally, the Story Cube's integration of visual prompts increased the willingness of students to speak in the language (Tabari et al., 2024).

The findings are rooted in the theoretical perspectives of affective filter hypotheses which is extremely vital in SLA. The use of the Story Cube promotes the employment of strategies that encourage student autonomy and giving them creative freedom to construct stories freely. Ultimately, this study has reinforced certain theoretical understandings related to SLA. Playful activities like the Story Cube focus on meaning-making and eventually lower the affective barriers resulting in increased willingness to speak (Teimouri et al., 2022; Pawlak et al., 2021). While it can be argued that speaking frequency during the intervention contributed to the reduced anxiety, the role of the Story Cube which integrated structured storytelling procedures not only reduced anxiety but increased confidence to speak out ideas.

Effect of the Story Cube Intervention on Speaking Performance

One of the key findings in this study demonstrated that the intervention increased speaking performances in multiple dimensions. Task-based and game-based learning have been proven to improve fluency, coherence and lexical use. Activities which incorporate elements of game-based learning reportedly have been able to increase students' speaking in terms of fluency, coherence and lexical use. Collaborative speaking activities driven by the use of the Story Cube encouraged learners to speak with more meaningful contents (Sato & Loewen, 2023; Kruk et al., 2022). It was clearly observed that the Story Cube enhanced their speaking performance primarily by reducing the cognitive load and making the creative process easier.

In line with Jaya et al. (2022), the current study showed that the Story Cube intervention improved spontaneous language production because of its features like visual prompts through the images on the Story Cube. On top of that, the use of visual prompts in the current study has been a key highlight. The visual prompts are in line with the concept of scaffolding where the Story Cube Evidence in the results further proved that speaking performance was not only spontaneous but reflected the students' real thoughts and creative ideas as opposed to prepared speech. One clear evidence in the rubric is the aspect where meaning-making was evaluated, and students showed different levels of meaning-making when

they spoke. The Story Cube aids students' creative thinking and development of their cognitive processes systematically.

Linking Anxiety Reduction and Speaking Performance

Anxiety reduction and speaking performance are two variables that are related inversely. Essentially, the results in the current study as shown by the empirical evidence showed that there is a reciprocal relationship between anxiety reduction and increase in speaking performance. It aligns with some of the past studies which showed that students who have less speaking anxiety, speak more freely and confidently (Derakhshan et al., 2022; Pawlak et al., 2021). It is obvious that speaking performance is influenced by the reduction of anxiety in speaking because when the level of anxiety is reduced, willingness to speak increases making students speak with more confidence.

Corrective feedback was not the focus of the current study and therefore, corrective feedback was not given explicitly for both the groups. This was done to ensure that no other elements influenced the reduction of anxiety in speaking and the increase in speaking performance. This enhances the results of the study where the focus is the employment of game-based storytelling intervention to improve speaking performance and reduce speaking anxiety. The experimentation of a single pedagogical invention such as the Story Cube that can integrate the principles of affective-sensitive pedagogy and correlatedly increase speaking performance by reducing speaking anxiety reinforces the call for integrative ESL approaches (Waluyo & Bakoko, 2022).

Novelty and Contribution of the Study

This study ultimately provides concrete evidence that supports the Story Cube intervention as a contemporary solution to the speaking anxiety issues faced by second language learners. This study distinguishes between the elements of motivation and confidence that have been studied extensively in the past. It provides clarity in understanding how the dimensions of speaking performance can be significantly increased through reduction of speaking anxiety with the use of an intervention that addresses the affective aspects of learning. Unlike technology-dependent interventions, the Story Cube approach requires minimal resources, making it accessible for diverse educational contexts. This practical advantage enhances the relevance of the findings for classroom practitioners and curriculum designers.

CONCLUSION

The Story Cube intervention reduced English-speaking anxiety and improved speaking performance of the students in the experimental group. The students in the controlled group who went through conventional classroom practices did not experience significant reduction in anxiety and improved speaking performance after the duration of intervention. Ultimately, these findings indicate that the Story Cube intervention succeeded in lowering

the English-speaking anxiety among the students. This resulted in the improvement of speaking performance among the students. The results call for fresher innovations that integrate game-based storytelling approaches in the classroom. In conclusion, the Story Cube intervention represents innovations in the classroom that can address the speaking anxiety of students and improve the students' speaking performance.

IMPLICATIONS OF THE STUDY

Pedagogical Implications

This study has provided results that support the pedagogical practices which are affective-sensitive. Stemming from the ideas of Krashen's Affective Filter Hypothesis, the pedagogical practices which are affective sensitive are generally teaching and learning activities that eliminate or reduce practices which elevate a student's anxiety. These practices promote learner engagement, collaboration and creativity. The use of the Story Cube does this by encouraging learners to communicate in groups and produce meaningful interaction without having to worry about being judged or corrected. Additionally, the Story Cube also promotes the use of low-cost easy to produce teaching aids that can create positive impacts in the classroom. It is an ideal tool that reinvents classroom dynamics and gives teachers the advantage to address issues like speaking anxiety.

Theoretical Implications

The study supports contemporary SLA research by providing empirical evidence that further corroborates the theoretical claims surrounding oral performance and affective factors. It has been reported that speaking development is not entirely a linguistic process but rather a combination of various emotional elements that create a better oral development. The discoveries made in this study is in line with Pawlak et al. (2021) who also explained how the emotional factors played a significant role in the development of speaking skills among students. Additionally, the study lends support to the more popular game-based theoretical foundations for language learning. It supports the integration of gamification features that increase learner participation and eventually give positive impacts towards their speaking skills and anxiety levels.

LIMITATIONS FOR FUTURE RESEARCH

There are limitations that should be acknowledged. The quasi-experimental design is not without its limitations. Depending on it has limited the generalisability of the findings to understand the ESL speaking anxiety phenomena among students all over Malaysia. This brings the suggestion for future studies to randomise trials across schools in different states and districts. Second, corrective feedback is a critical part of SLA and without controlling corrective feedback totally, the results of the study can still be affected. In the future, both the controlled and experimental groups should be taught without any kind of corrective feedback

to avoid interference in the results. On top of that, the duration of the intervention was short. Longitudinal research is better for deeper insights and better quality of results. Finally, the entire study depends on quantitative measures. Addition of qualitative data could provide in-depth information on the learners' attitudes and emotions. Classroom observations could provide valuable data on the use of the Story Cube and the students' perceptions towards its use.

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REFERENCES

Alrabai, F. (2020). Foreign language anxiety and learners' achievement: A meta-analysis. *System, 92*, Article 102261. https://doi.org/10.1016/j.system.2020.102261

Badrasawi, K. J., Solihu, A., & Ahmad, T. B. T. (2020). Second language speaking anxiety among Malaysian postgraduate students at a faculty of education. *International Journal of Education and Literacy Studies, 8*(2), 54-61.

Botes, E., Dewaele, J.-M., & Greiff, S. (2020). The foreign language classroom anxiety scale and academic achievement: An overview of the prevailing literature and a meta-analysis. *Studies in Second Language Learning and Teaching, 10*(1), 95-131. https://doi.org/10.14746/ssllt.2020.10.1.5

Creswell, J. W., & Guetterman, T. C. (2021). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (6th ed.). Pearson.

Derakhshan, A., Kruk, M., Mehdizadeh, M., & Pawlak, M. (2022). Boredom in online classes in the EFL context: Sources and solutions. *System, 103*, Article 102703. https://doi.org/10.1016/j.system.2021.102703

Field, A. (2020). *Discovering statistics using IBM SPSS statistics* (5th ed.). Sage.

Ghafar, Z. (2024). Storytelling as an educational tool to improve language acquisition: A review of the literature. *Journal of Digital Learning and Distance Education, 2*(10), 781-790.

Höl, D., & Kasımi, Y. (2022). A growing dilemma: English speaking anxiety-in-EFL classrooms: A review of research. *RumeliDE Dil ve Edebiyat Araştırmaları Dergisi*, (28), 421-438.

Ismail, Z., Rasit, N., & Supriyatno, T. (2023). Between oral language anxiety and students' Arabic language learning outcomes in Malaysian secondary schools. *International Journal of Language Education, 7*(1), 143-161.

Jaya, H. P., Petrus, I., & Pitaloka, N. L. (2022). Speaking performance and problems faced by English major students at a university in South Sumatera. *Indonesian EFL Journal, 8*(1), 105-112.

Kayi-Aydar, H. (2021). Social interaction, negotiation of meaning, and second language development. *The Modern Language Journal, 105*(S1), 174-191. https://doi.org/10.1111/modl.12673

Kiruthiga, E., & Christopher, G. (2022). The impact of affective factors in English speaking skills. *Theory and Practice in Language Studies, 12*(12), 2478-2485.

Knoch, U., & Chapelle, C. A. (2021). Validation of rating processes within an argument-based framework. *Language Testing, 38*(3), 343-368. https://doi.org/10.1177/0265532220961380

Kruk, M., Pawlak, M., Mystkowska-Wiertelak, A., Derakhshan, A., & Mehdizadeh, M. (2022). Investigating foreign language enjoyment, anxiety, and boredom in task-based language teaching. *System, 103*, Article 102684. https://doi.org/10.1016/j.system.2021.102684

Lim, N. Z. L., Zakaria, A., & Aryadoust, V. (2022). A systematic review of digital storytelling in language learning in adolescents and adults. *Education and Information Technologies, 27*(5), 6125-6155.

Mustapha, N. A. N., & Uri, N. F. M. (2024). Investigating the level and factors of speaking anxiety among high performing school students. *The English Teacher, 53*(2).

Nguyen, T. T. M., & Newton, J. (2020). Task-based interaction and second language acquisition: Insights from classroom research. *Language Teaching Research, 24*(4), 487-509. https://doi.org/10.1177/1362168818784616

Pawlak, M., Mystkowska-Wiertelak, A., & Bielak, J. (2021). Investigating the dynamic nature of willingness to communicate in the foreign language classroom. *System, 98*, Article 102473. https://doi.org/10.1016/j.system.2021.102473

Phan, T. A. N., Le, H. H., & Phan, G. A. V. (2024). From words to wonders: EFL students' perceptions of digital storytelling for language learning. *International Journal of Language Instruction, 3*(4), 59-92.

Pike, C., & Raymundo, J. L. (2024). Public speaking classroom anxiety and oral language performance of senior high school students. *International Journal of Linguistics, Literature and Translation, 7*(7), 143-151.

Pinner, R., & Ushioda, E. (2020). Authenticity and motivation in language learning. *Language Teaching Research, 24*(2), 236-253. https://doi.org/10.1177/1362168819894551

Sato, M., & Loewen, S. (2023). *Evidence-based second language pedagogy: A collection of instructed second language acquisition studies*. Routledge. https://doi.org/10.4324/9781003038500

Shanmugan, G., Subramaniam, V., & Sultan, M. T. H. (2025). English speaking anxiety among primary students: Evidence from Tamil vernacular schools in Selangor, Malaysia. *Pertanika Journal of Social Sciences & Humanities, 33*(6), 2707-2721. https://doi.org/10.47836/pjssh.33.6.25

Subramaniam, V., Shanmugan, G., & Sultan, M. T. H. (2025). Gamification as pedagogical innovation: Evaluating the Story Cube approach to reduce English-speaking anxiety. *Pertanika Journal of Social Sciences & Humanities, 34*(1), Article 20. https://doi.org/10.47836/pjssh.34.1.20

Subramaniam, V., Shanmugan, G., Wan Salim, W. I., & Sultan, M. T. H. (2026). English-speaking anxiety among primary school learners in Malaysian vernacular schools: A systematic literature review. *Pertanika Journal of Social Sciences & Humanities, 34*(3), 1569-1590. https://doi.org/10.47836/pjssh.34.3.21

Tabachnick, B. G., & Fidell, L. S. (2021). *Using multivariate statistics* (7th ed.). Pearson.

Tabari, M. A., Khajavy, G. H., & Goetze, J. (2024). Mapping the interactions between task sequencing, anxiety, and enjoyment in L2 writing development. *Journal of Second Language Writing, 65*, Article 101116.

Taber, K. S. (2020). The use of Cronbach's alpha when developing and reporting research instruments in science education. *Research in Science Education, 50*(6), 1-24. https://doi.org/10.1007/s11165-016-9602-2

Teimouri, Y., Goetze, J., & Plonsky, L. (2022). Second language anxiety and achievement: A meta-analysis. *Studies in Second Language Acquisition, 44*(1), 1-25. https://doi.org/10.1017/S0272263121000311

Tran, T. T. L. (2022). An investigation into the causes of students' anxiety in learning English speaking skills. *International Journal of TESOL & Education, 2*(3), 183-196.

Waluyo, B., & Bakoko, R. (2022). Effects of affective variables and willingness to communicate on students' English-speaking performance in Thailand. *Studies in English Language and Education, 9*(1), 45-61.

Xue, Q., & Noels, K. (2025). Assessing accent anxiety: A measure of foreign English speakers' concerns about their accents. *Studies in Second Language Acquisition, 47*(1), 230-256.

Zhang, L. J., & Tsung, L. (2021). Learning to speak in a second language: Affective and cognitive dimensions. *Applied Linguistics Review, 12*(4), 603-626. https://doi.org/10.1515/applirev-2019-0107

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Actor Logics and Urban Informality in the Context of Subdivision Operations in Koudougou (Burkina Faso)

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ABSTRACT

With a view to improving the organisation and harmonious development of its various towns, the Burkina Faso government has incorporated subdivision into its urban development policy. However, the implementation of these subdivisions is fraught with conflict, leading to the informal construction of towns. This paper is therefore devoted to analysing the logics of the actors involved in the formation of informal settlements in the context of subdivision operations in Koudougou. To this end, primary and secondary data were collected on urban fabric. The processing and analysis of these data revealed the illicit allocation of plots at the expense of the rightful owners, which provoked indignation among residents and triggered planning conflicts. These conflicts paralyse the continuation of subdivision operations and encourage the emergence of an urban informality that manifests itself both in the configuration of the urban fabric and in the practices of local urban planning actors.

*Keywords: A*ctor logics, Burkina Faso, conflict, Koudougou, subdivision, urban informality

INTRODUCTION

Rapid population growth in West African cities is leading to urban sprawl (Coquery, 1997). This reality calls for the use of tools to achieve rational resource management in the urban fabric process (Chenal, 2009). Long considered the prerogative of the State, urban planning has produced tools deemed inappropriate to the situation of rapidly expanding cities (Sory, 2017). In this context, the introduction of Structural Adjustment Plans (SAPs) in the late 1970s

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fostered the emergence of local governments and private actors in the production of urban space, helping to address the shortcomings of centralised urban planning (Domergue, 2003). As a result, we are witnessing the participation of several actors (city dwellers, the private sector and decentralised authorities) in urban development operations. This marks a shift from traditional urban planning, considered obsolete, to strategic territorial planning (Sory, 2017). It was in this context that municipal development projects emerged, reinforcing the process of state disengagement, administrative and budgetary decentralisation, and devolution of state powers (Osmont, 1995). Indeed, the aim is to boost the development of local authorities, while at the same time intensifying the process of involving the population in their own development, by triggering citizen motivation (Ribot, 1999). In this respect, decentralisation promotes the participation of grassroots players (private individuals, city dwellers and municipal authorities) in the urban development process, with a view to giving the State real legitimacy (Lajugie, 1985). This reality often results in a situation where social power predominates (Costes, 2010), characterised by the appropriation of urban space by city dwellers.

Against this backdrop, the June 2, 1991, constitution established the organisation of Burkina Faso's territory into local authorities: regions and communes. This led to the emergence of local governments, with the first municipal elections held in 33 communes in 1995, and the third nationwide in 2006. As a result of the decentralisation process, each commune is responsible for urban planning and development (Sory, 2019). The application of this new governance by local governments requires citizen participation. In this power game, social actors often lead to more or less visible forms of resistance, in order to correct institutional actors who do not always seem to protect their interests (Legros, 2008). In reality, the interplay of actors involves power relationships that reflect each actor's capacity for influence and action in the urban planning process, the effects of which give rise to the transformation of the urban fabric (Sory, 2016). According to a report on urban land use, it is within this context that the development of urban space takes place in most cities in Burkina Faso, particularly in Koudougou (Parliamentary Commission of Inquiry, 2016). Although planning policy is the foundation of harmonious organisation and development, failures in the acceptability and implementation of urban infrastructures or projects are becoming more and more frequent. As a result, conflicts are emerging that are paralysing the achievement of this policy's objectives. The dynamics of conflict do not exist in themselves but rather emanate from the actions of several players (Bulle & Tarragoni, 2021). On this basis, the recurrence of conflicts in the implementation of subdivision operations in Koudougou is linked to the actions of the actors involved in putting these development operations into practice. So, how do the logics of the actors involved in the production of urban space in

Koudougou contribute to urban informality in the context of the implementation of subdivision operations? To answer this question, the research first describes the influence of the logics of the actors involved in the process of subdivision operations on the urban configuration in Koudougou. Next, it sheds light on the occupation process in the city's various conflict zones. Finally, it shows the determining characteristics of informal settlements formed in the context of subdivision operations in Koudougou.

LITERATURE REVIEW

Actor Logics

In public policy, the actor is fundamentally defined in terms of both his actions and his contribution (Grossman, 2014). To this end, the actor's action inevitably produces concrete repercussions on the system in which it evolves. The actor has intentionality and strategic potential (Doussot & Themines, 2016). At the same time, they maintain relationships with the society and territory in which they live (Sébastien & Paran, 2006). In this social space characterised by relationships, an interdependence exists between the logic of action and the logic of actors (Crozier & Friedberg, 1977). In fact, actor logic influences the actions of different actors, as well as strategic decisions. Similarly, the logic of action determines the logic of actors, insofar as the position, reasoning and strategies developed by each actor are a function of the universe or apparatus that subjugates him and within which he carries out his actions. It is in this sense that the analysis of action logics in organisational phenomena fosters understanding of actors' behaviour, by revealing the reasons that drive individuals to act (Bréchet & Schieb-Bienfait, 2011). As a result, an analysis of actor logic simultaneously takes into account the actor and the situation in which he performs his action. Actors perform actions in their environment according to logic that guides their role in society. On the basis of these logics, Mermet (1992) sets out four criteria for understanding and synchronising the actions of different stakeholders in the management of a territory. Firstly, richness concerns the abundance of what attracts the actor's attention. Secondly, the security of the stakeholder's position is analysed in relation to the risk posed to the stakeholder or the environment. Adaptability assesses the potential for change offered by the way the environment is managed. Finally, coherence describes the actor's consistency in relation to his official position within an institution or organisation. Whether in the context of an expressed logic, i.e. one that is verbalised, or an interpreted logic, i.e. one that reflects the real interest driving the actor's action and which he or she does not wish to externalise, these criteria are essential to their understanding (Partoune, 2010). The balance of power between the various actors and the diverse relationships they maintain can also help us to understand the logics of action (Maroy, 1990). Governance and production processes play a crucial role in development mechanisms (Torre, 2018). The way actors act on the social system through their strategies or actions

influences territorial development (Loubet & Serry, 2020). Thus, actor logics are determining factors that influence social evolution by generating transformations in the way organisations operate (Authier, 1993). In a dynamic of power relations, human relationships are naturally undulating and conflictual (Marc & Picard, 2015). Yet collective bargaining is a kind of institutionalisation of power relations in most capitalist countries (Boivin, 1979). For some cities, the power relations at work paralyse the implementation of planning tools (Sory, 2019), thus influencing the urban configuration, resulting in a construction of the city outside the norms or in informality.

Urban Informality

Informality does not derive from the use of the term "formal"; originally, it was an economic notion. It has evolved over the years, becoming increasingly complex, to the point where it is now used by sociologists, anthropologists, political scientists, and even geographers. Informality is a universal phenomenon, the prerogative of neither developed nor developing countries. It is a transgressive game that is either part of a voluntary dynamic or forced by the texts in force (Bennafla, 2015). In its complexity, by virtue of its vague and polysemous nature, informality designates any practice or activity that escapes or takes place outside the institutional and regulatory framework (Laurence & Florence, 2010). It is thus generally accepted that informality is any manner or action distinct from what is institutional, where personal interactions predominate. It concerns all sectors of activity and crystallises economic, social, political, and spatial relations. Based on political informality, urban informality is often approached from an analysis of arrangements in various urban contexts (Inverses et al., 2016). The perception of informality in West African cities is relativised, varies according to context and differs from one country to another (Gomis et al., 2019). For some authors, informality is seen as a set of practices or activities that take place outside the rules or what is official. It is not simply reduced to an opposition of what is "formal"; on the contrary, the two notions (formal/informal) are tied together in a system of relationships where informality even becomes the continuum of formality (Gomis et al., 2019; Mcfarlane, 2016). These authors see formality and informality as two inseparable notions, evolving in a symbiotic relationship, with no dichotomy between the term's formal/informal. For others, on the other hand, it is conceived as a territorial formation evolving outside legality, notably through construction without official authorisation (Durand-Lasserve, 1986; Robineau, 2014). This perception of urban informality refers to non-regulatory forms of housing, i.e. any land occupation outside the dynamics of formal urban development. In the light of this latter vision, urban informality can therefore be considered, in certain circumstances, as a direct or indirect consequence of the failure of planning policies, leading to the construction of

cities outside established frameworks. Thus, urban informality generally stems from the actions of informal actors and their logic (Berroir et al., 2016). In urban planning, the actions of different actors intertwine or act in isolation to shape urban landscapes. As analysed by Watson (2014), new alliances are forming between political leaders and the emerging urban middle classes, driven by a common desire for land appropriation and revaluation within the context of Africa urban dynamics. These processes, by marginalising and dispossessing poor city dwellers of their land political rights, lead to the failure of urban development visions and projects. This article therefore examines the dynamics of the actors involved in the production of informal neighborhoods, in relation to land subdivision operations in Koudougou.

METHODOLOGY

Drawing on a strategic analysis based on a documentary and factual approach, this research is based on data from the state of the art, direct observation, and surveys. Thus, this article mobilises qualitative and quantitative data with a view to scrutinising the actions of the various actors in the formation of informal settlements in Koudougou in the context of subdivision operations. Secondary data are based on documentary research to gather information on the challenges involved in implementing development policies. It focuses in particular on the actions of local actors in the formation of informal settlements during subdivision operations in Koudougou. The primary data, both qualitative and quantitative, were collected between January and March 2024. Data collection was based on interview guides and a questionnaire. The questions concerned all the social and political players involved in the development of the city of Koudougou. Speaking of social actors, customary chiefs, landowners and ordinary residents were interviewed. With the political players, questions were put to the deconcentrated and decentralised authorities (the municipal authorities). The deconcentrated authorities interviewed were estate agents, land registry, and urban planning officers, land affairs, and housing officers. Demographic sampling was carried out throughout the town of Koudougou using a systematic survey based on probability sampling, applying Yamane's (1967) formula as follows:

$$\boldsymbol{n} = \frac{\mathrm{N}}{1+\mathrm{N}.(\mathrm{e})^2} \qquad [1]$$

$\boldsymbol{n}$ is the sample size

N is the total population size

e is the desired margin of error (precision level)

In order to ensure adequate sample representation for all population elements, data were collected taking into account each stratum of resource persons. Thus, for a population of 160,239 in Koudougou (Institut National de la Statistique et de la Démographie[1], 2022), with a margin of error

[1] This is the National Institute of Statistics and Demography.

of 6% due to sampling stratification, the required sample size is:

$$\boldsymbol{n} = \frac{160\,239}{1 + 160\,239\text{x}0{,}06^2} \qquad [2]$$

$$\boldsymbol{n} \approx 277\ people$$

In this study, data were collected from 320 people, including 208 indigenous people, 103 non-indigenous people, 4 decentralised authorities, and 5 deconcentrated authorities. All the data, both primary and secondary, were processed and analysed in order to better situate the responsibility of the various players in the failure of subdivision operations in Koudougou. Although the respondents were selected at random, they were mobilised through a stratified sampling process that included all relevant categories. With a margin of error of 6%, these data provide a solid analytical framework for understanding the rationale behind the actions of those involved in the formation of informal settlements in Koudougou. Respondents are designated by pseudonyms in order to respect the principle of anonymity promised to them.

RESULTS AND DISCUSSION

From the Perception of Subdivision to Protest Participation

If we are particularly interested in how people perceive subdivision operations, it's because they are one of the essential links in the realisation of the city. In this respect, Subra (2012) believes that planning is not just a matter for specialists and rulers, but also for citizens. Thus, if urban planning is the visible expression of political power over the city it governs, this power can only be exercised in its fullness once it has won the participation of the population (Allogho-Nkoghe, 2006). Social actors' perceptions of the subdivision operations in Koudougou overlap. According to Koudougou residents' perception of subdivisions, they are not inherently bad. It improves urban aesthetics, creates a pleasant living environment for people, and creates a city network that is favourable to economic activities, thus contributing to development. In addition, local residents are quick to point out that subdivisions provide state-recognised land ownership, unlike those not subdivided, and facilitate access to social services such as water and electricity. All these advantages linked to the legal city are also the reason why people are increasingly fighting for the right to a subdivided plot. As a result, all those interviewed agreed on the importance of subdivisions for city dwellers. The graph (Figure 1) illustrates the stakes associated with land subdivision as perceived by urban planning stakeholders in Koudougou.

Figure 1 shows that social stakeholders in the city of Koudougou have a favourable perception of land subdivision projects, as they all recognise their importance. Indeed, 100% of actors affirm that urban development operations help create a harmonious living environment. Secondly, 64.10% of these same actors recognise the ability of urban subdivisions to organise economic and administrative activities. Finally, 38.46% and 94.55% of respondents,

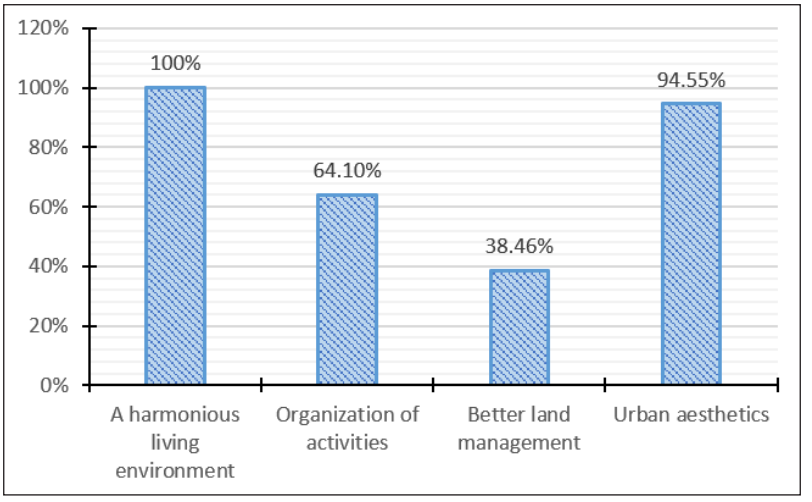

Figure 1. Stakes of subdivision operations according to local actors
Source: Authors' personal work

respectively, highlighted the improved land management and urban aesthetics generated by subdivision operations in the configuration of the urban fabric. This study is not the only one to confirm these results. Inhabitants of the town of Koudougou had already perceived subdivision in a holistic way, as an effective response to the challenges of urban and sustainable development (Hilgers, 2008). For them, urban subdivision embodies a collective interest connected to life in the city.

If the logic of representation influences that of action (Baghdjian, 2014), it is therefore appropriate to first study people's perceptions of subdivision operations before dwelling on the root causes of protest participation. The factors that determine residents' practices are intrinsically linked to the way in which administrative actors practice the politics of the urban factory. The actions of political actors influence those of social actors and lead them to adopt behaviour characterised by protest. The actions of these actors are revealed both in scientific reasoning and in field surveys. Clearly, the allocation of the same plot of land to several people, the allocation of plots to family members, friends and people of one's political persuasion, at the expense of the true landowners or rightful claimants, outrages the local population. This is why they organise themselves into groups to oppose the production of urban space, even though they are counting on the subdivision to bring them into the legal city. Thus, X states:

> Subdivision is supposed to promote urban development, but municipal authorities abuse it to dispossess citizens of their land for personal enrichment. How can such a practice truly promote urban development? No sensible person would oppose their

> own happiness. This is why we are firmly opposed to the allocation of the same plot of land to several people, to the misappropriation of plots, and to any form of corruption linked to the subdivision process. In short, our fight is focused on the mismanagement of local authorities. (Interview with X, Primary Education Inspector, February 2024)

This survey information corroborates Hilgers' (2007) findings concerning the implementation of subdivision operations in Koudougou since 1998. The author describes the situation, highlighting the persistence of nepotism, corruption, and arbitrary evictions during subdivision operations. In addition, he points the finger at the illicit allocation of plots to the detriment of those entitled to them. On this basis, more than 1,800 complaints were recorded, mainly due to the double allocation of plots[2]. Corruption and misappropriation of plots of land during subdivision operations in Koudougou are thus becoming a way of life for political actors. As a result, social actors are mobilising to oppose this action, leading to the emergence of conflicts during subdivision operations. It is in this context that the mechanism for creating conflict zones in the urban fabric of Koudougou is to be found, hence the interdependence of actor dynamics. In reality, despite the interest that social actors gain by promoting subdivision operations, they are opposed to the way in which municipal authorities allocate plots. Instead of serving social actors, the production of plots victimises them by dispossessing them of their land. The inhabitants of the town of Koudougou are not opposed to land subdivision; rather, it is the way of conceiving and implementing the production of urban space that triggers revolts. Although Olson's (1965) research is set in an economic context, the universal nature of his approach also enables us to contextualise local urban planning actors within their social and political universe, in order to explain their behaviour. In his study, the author considers collective action as the expression of predetermined interests. It is within this framework that common interests imply grouping. In the Burkinabe context, the practice of subdivision operations to satisfy the interests of certain groups does not meet the needs of social actors (Sory, 2016). Thus, the way in which municipal authorities allocate plots during land subdivision operations in Koudougou prompts reactions from local residents. This reaction is characterised by protests, also known as protest participation (Hilgers, 2008). Such protests give rise to urban riots, generating spatial dynamics that political actors are unable to control. This was the case with violent protests during the 1998-2004[3] and 2021 subdivision operations in the town of Koudougou. Disputes during development operations are not exclusive to Koudougou. Several studies reveal that subdivision operations in other towns have been blocked by contestations

[2] Complaints recorded by the disputes commission set up in 2013.

[3] For further details, see Hilgers (2008).

due to misappropriation of plots by local authorities (Adegbinni et al., 2022; Tingbé-Azalou, 2015). These studies show that in Benin, precisely in the communes of Comé, Ouidah and Sèmè-Podji, disputes linked to subdivision operations have led to conflicts.

From Protest Participation to Urban Informality

The opinions of social actors on protest participation in the execution of subdivision operations in Koudougou are divided along two different lines. For some, in the face of injustice, violent protests are desirable to ensure that justice prevails. For others, non-violence is the most powerful weapon in all respects for achieving justice and peace. Thus, the following graph explains how social actors perceive the use of violence against the way plots are allocated in Koudougou.

The question of the legitimacy of the use of mob violence during subdivision operations in recent years raises two major responses. According to Figure 2, 89.10% of the population believes, on the one hand, that the use of violence is legitimate insofar as it allows them to express their resentment toward the illegal actions of local authorities in implementing land subdivision projects. On the other hand, 10.90% of actor-inhabitants affirm the illegitimacy of this opposition according to the idea that non-violence is a quiet force for the expression of truth. For them, violence is not the best way to solve problems; if men have been given the right to speak, it's so that they can use polite debate to resolve

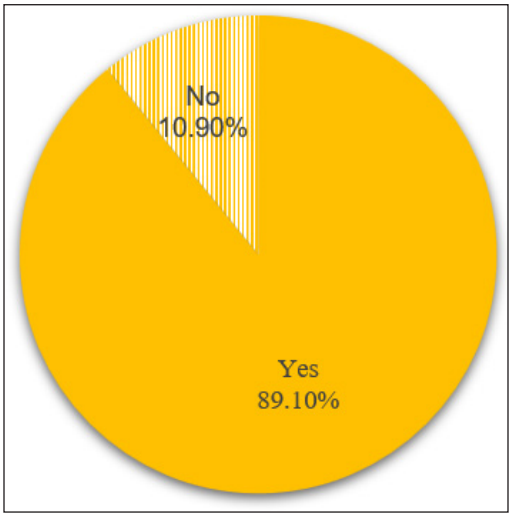

Figure 2. Popular perception of the use of violence
Source: Authors' personal work

differences. These percentages therefore justify the behaviour patterns of most actors in conflict planning and the emergence of urban informality.

Although the city is the place of par excellence where state power is exercised, the urban process is not solely the result of decisions and actions by public authorities (Rivelois, 1986). Thus, the current state of the urban fabric in Koudougou is the result of the actions of several development actors. It is under these conditions that the effective implementation of subdivision operations requires agreement between the different actors, and therefore agreement between the different elements of the system (Rode, 2017). Yet the aforementioned information reveals a mismatch between the logics of actors and the officially legitimised powers they hold, which is indicative of dysfunction. In fact, the logic employed by actor-inhabitants in the process of

producing urban space in Koudougou are the consequence of the practices of political actors (Hilgers, 2008). The collusion of interests, engendered by the way urban planning policy is thought and practiced, hampers the implementation of subdivision operations. As a result, the city was built informally. Y's comments support this assertion when he points out:

> During subdivision operations, poor management provoked indignation among local residents, leading to protests. These objections led to the digging up of bollards by local residents, with the aim of halting further subdivisions. This situation has led to blockages in certain subdivision operations, encouraging the proliferation of informal settlements. This is particularly true of the Kassou subdivisions, the Guy conflict zones, and Sectors 1 and 2. It should be pointed out that our opposition to the subdivision is not based on a total rejection of this process, but rather on a desire to ensure our survival and to denounce the illicit practices of the political actors involved in the development of the city of Koudougou. (Interview with Y, teacher living in Kassou, February 2024)

Surveys are not the only source of these results. Continuing his investigations in Koudougou, Hilgers (2008) justifies the digging up of boundary markers and the violent protests of the population by the multiple injustices of communal power. It is in this sense that land-use conflicts contribute to the creation of territoriality. It creates conditions conducive to individuals coming together to better defend their common living space (Lecourt, 2003). Thus, faced with the abuses of power of administrative actors, who are the decisionmakers, resident actors reshape the urban landscape through protest and conflict. The recurrence of conflicts observed during subdivision operations in Koudougou reveals the inability of political actors to deal with this phenomenon and tends to reinforce the power of landowners in the process of urban design. The balance of power maintained by decision-maker actors, which evolves in favour of landowners, explains the fragility of administrative structures and, at the same time, increases the insecurity of urban dwellers with regard to the appropriation of plots of land. In this context, the interplay of actors creates conflicts that reveal the balance of power in favour of local actors. The direct consequences of this dynamic are, among other things, the blocking and delaying of subdivision operations and the emergence of informal settlements. For this reason, since the period from 1998 to 2004, 19,222 plots covering an area of 2,294 hectares have remained in the project stage (Ministry of Housing and Urban Planning, 2012). These are unallocated plots and plots that have not been cleared by the action of conflicts linked to subdivision operations in the town of Koudougou. Figure 3 shows the main conflict zones in the town of Koudougou.

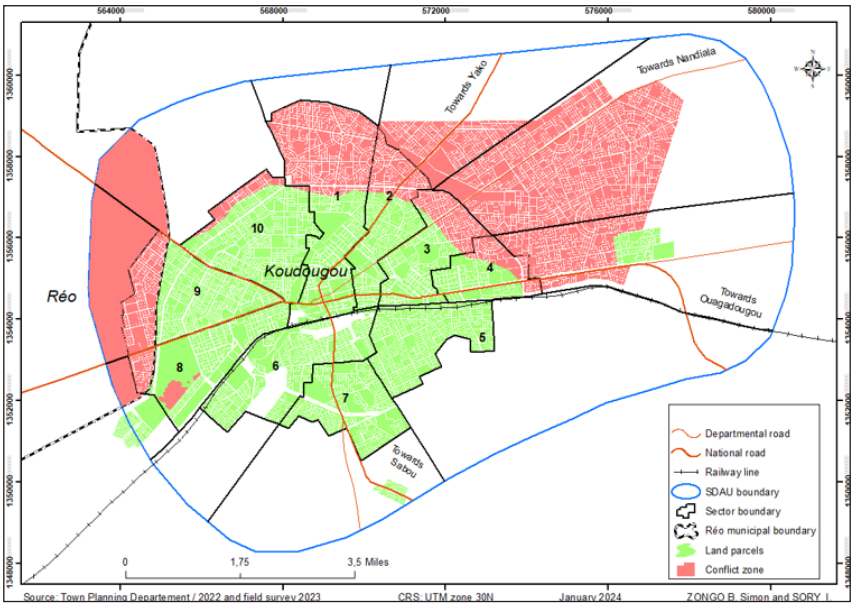

Figure 3. Main areas of conflict in the town of Koudougou

The data show that the dynamics of local actors lead to conflicts during subdivision operations in Koudougou, paralysing the continuation of these operations. This institutional paralysis contributes to the emergence of informal neighborhoods, characterised by urban configurations that diverge from those prescribed by planning instruments, thereby giving rise to a city that is produced through informal processes. In a similar situation, the implementation of development operations in the neighborhoods of the city of Korhogo (Côte d'Ivoire), born during the war, was blocked by development conflicts, leaving 26.7% of these neighborhoods in informality around the years 2017 (Koissy et al., 2017). Thus, power relations between urban planning actors often lead to the formation of informal housing.

Anchoring Processes in Conflict Zones and Their Determining Characteristics

An actor is defined primarily by the intentionality of his or her approach (Humain-Lamoure & Laporte, 2017). Thus, the strategies developed by the various actors guide the transformation of urban space. This reality highlights an incongruence in Koudougou between the expected results of the metamorphosis of urban fabric and the facts. In other words, the actions of local development actors in Koudougou are creating a glaring gap between what has been achieved and the results expected by development policies. Faced with this situation, social actors are adopting strategies to occupy conflict zones. Indeed, the parts of the various conflict zones that have been subdivided and not subject to boundary marker removal reveal

a continuation of the balance of power in favour of the landowners. Many landowners take back their parcelled-out land to build or sell to those who need it. The occupation of plots by landowners is often carried out with the help of certain municipal agents. You can see this in Z's words when he declares:

> After the subdivision operations were halted following the removal of the boundary markers, I discovered that some landowners were selling their plots with the complicity of the mayor's office. Since then, I've built the yard I live in today. Right now, I'd rather fight to the death than leave this plot. If I leave my yard, not only will I have no other place to go with my family, but I'm also aware that I'll die without ever having a plot in my life. (Interview with Z, landowner in sector 2, February 2024)

Thus, following the cessation of subdivision operations due to planning conflicts, social actors adopted a strategy of occupying the various conflict zones. Landowners, taking advantage of the weakness of political actors, build on or sell already subdivided plots. In unparcelled areas, they break up and sell them to meet demographic pressure. In addition to this situation, some councillors, knowing that landowners do not always know the location of their plots, take advantage of the unrest to sell them illegally. This statement was echoed by P in the following terms:

> The subdivision problems facing the people of Koudougou are largely due to the actions of the municipal councillors. During the major subdivision operation of 1998, each sector had councillors responsible for taking part in the allotment commission to ensure that the subdivisions ran smoothly. However, due to the obvious deficiencies in their work, the subdivision ended in failure. What's even more serious is the sale of plots by some of our colleagues after the operation stalled, as they had more in-depth knowledge of the plot locations than the actual landowners." (Interview with P, former Koudougou town councilor, February 2024)

In this context, the data show that the logic of the actors provokes conflicts that reveal the balance of power between the different actors. These conflicts paralyse subdivision operations, with consequences that continue to this day. On the one hand, this can be seen in the occupation or sale of plots already produced before the conflicts broke out, and the parcelling out and sale of areas not parcelled out due to the conflicts, by landowners. On the other hand, some local councillors, aware of landowners' ignorance of the location of many plots, are selling them illegally.

Neighborhoods affected by land-use conflicts in the city of Koudougou present several dimensions that denote the complexity of their urban informality. Faced with the unsatisfied need for plots as a result of development conflicts, self-organised practices are emerging to meet demand. In areas parcelised prior to the outbreak of conflict and which have not suffered the

removal of boundary markers, urban forms resemble those of formal neighbourhoods. However, from a legal standpoint, the lack of legal recognition of land rights raises issues of tenure security and the regularisation of occupants, given that they are not lawful for title holders. As for the areas affected by the removal of boundary markers, or those that have not been parcelled out, they are developing characteristics similar to informal settlements, both in legal and morphological terms. In addition to the fact that the inhabitants have no property rights, these areas show signs of unplanned urbanisation. These include the absence of reliable roads, cramped housing conditions, and a lack of basic social services such as water and electricity. These patterns illustrate a glaring discrepancy between reality on the ground and planned development policies. The following figure illustrates this situation in Koudougou, revealing a contrast between the plot plan and the reality of the town, which continues to be built informally.

In Figure 4, urban informality in Koudougou manifests itself mainly through the practices of local actors outside the formal framework, and forms of spontaneous settlement. In areas where the bollards were installed before the outbreak of conflict, they are occupied informally. The areas where the bollards were removed because of the conflicts, or those that were never parcelled out, reflect unplanned urbanisation. The latter is marked by disparate construction, high housing density, and a lack of reliable road infrastructure and basic social services. Several studies have approached urban

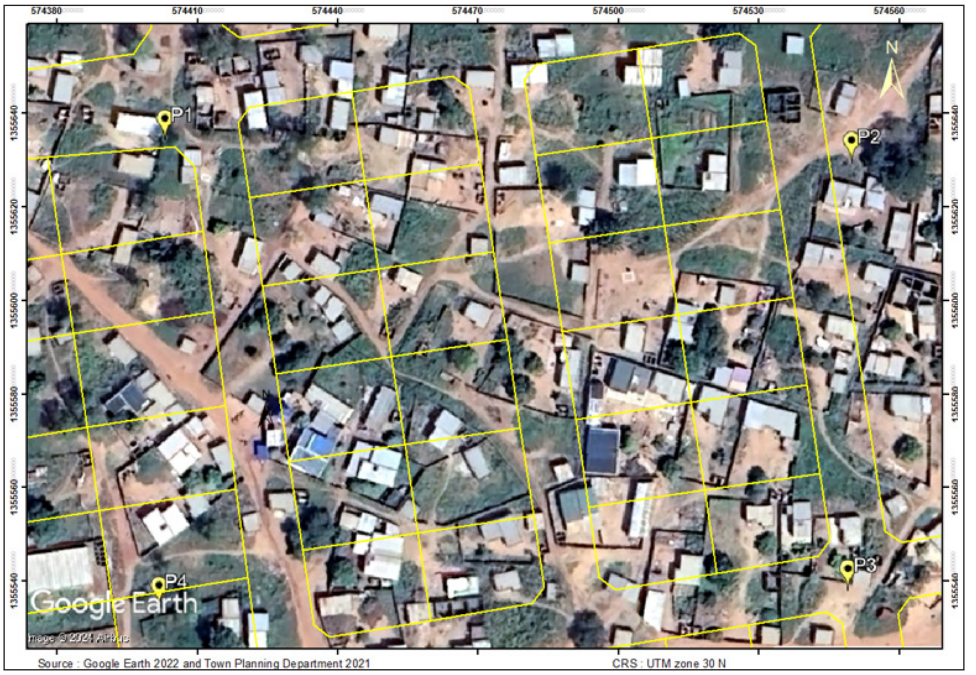

Figure 4. Gap between urban fabric and plot plan

informality on the basis of the morphological characteristics of housing, which develops in an unplanned or unregulated context (Allogho-Nkoghe, 2006; Moussa, 2021). In most cases, these neighborhoods emerge in response to rapid population growth and the powerlessness of the authorities to control it, unlike those in the town of Koudougou, which are mainly the result of planning conflicts.

CONCLUSION

Subdivision operations in Koudougou are frequently disrupted by conflicts, leading to the formation of informal settlements. Residents' dissatisfaction with the allocation of plots by local authorities leads them to oppose subdivision operations, despite their interest in supporting these projects. Indeed, failure to comply with planning policies often prompts residents to organise into groups to defend their interests, in favour of more rational and transparent management. These actions generate conflict, paralysing subdivision operations, and encouraging the formation of informal settlements. This dynamism gives rise to an urban informality in Koudougou, which is revealed both in the practices of local actors and in the configuration of the urban fabric. On the one hand, the informal practices of local actors can be seen in the occupation of plots unaffected by the removal of bollards. In these areas, landowners continue to sell or build informally on plots of land created before the conflicts. Neighborhoods built in this context have the appearance of formal urban fabric, even if the reality of the city shows otherwise. On the other hand, the occupation of areas affected by the removal of boundary markers, or those not parcelled out, displays the visible characteristics of informal settlements. In unparcelised areas, landowners are subdividing the land and selling off the unparcelised areas in response to growing demographic pressure. This has led to the creation of informal settlements with an urban layout different from that envisaged by the subdivision operations. This difference can be seen in the disparate layout of housing and activities, the lack of reliable roads, and the cramped nature of the dwellings. The various conflict zones in the town of Koudougou illustrate several dimensions of urban informality.

IMPLICATIONS OF THE STUDY

By exploring the actions of actors, this study opens up perspectives for the realisation of subdivision operations in Koudougou and indeed in Burkina Faso. The information provided reveals that development in Burkina Faso is marked by conflict, and this study can contribute to local and national development by improving governance through better coordination and cooperation between actors. In other words, it could transform urban planning practices by making the process more transparent, adaptive, and inclusive to local realities, promoting more balanced and sustainable urban development. In other words, it could transform urban planning practices, making the process more adaptive and inclusive to

local realities, and promoting more balanced and sustainable urban development. This study also provides a basis for future research. It contributes to the literature by providing new data and perspectives on the interactions between actors and urban informality in the context of subdivisions. For other cities or countries facing similar challenges, it serves as a reference for comparative studies.

LIMITATIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

Despite all the precautions taken to produce reliable results, it should be noted that this research has its limitations. The rapidly changing context of the town of Koudougou and the complexity of social dynamics restrict the quality of the work. In a context where actor logics evolve according to circumstances and interactions between actors (Bruner, 1990), the rapid evolution of Koudougou's urban dynamics makes the results less relevant over time. In addition, the difficulty of detecting the interpreted logic of actors within the framework of social interactions and human behaviour prevented this dimension from being fully taken into account in the study. As a result, complex social relations that are difficult to grasp in their entirety hamper understanding of the mechanisms underlying urban informality in Koudougou. Given the difficulty of gaining a scientific understanding of human behaviour (Toniolo, 2009), a holistic view of actors and their actions is required. A nuanced approach that takes into account not only explicit intentions, but also the social, cultural, and historical context in which the inhabitants of the city of Koudougou live is thus necessary for future studies.

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REFERENCES

Adegbinni, A., Chabi, M., Danvidé, B. T., & Avalla, C.-O. (2022). The governance of subdivisions via disputes: Example of the municipality of Sèmè-Podji in Benin. *Territory in Motion: Journal of Geography and Planning, 52*. https://journals.openedition.org/tem/9080

Allogho-Nkoghe, F. (2006). *Urban policy and stakeholder dynamics: Seeking planning alternatives for the informal settlements of Libreville (Gabon)* [Doctoral dissertation, Montpellier 3]. https://www.theses.fr/2006MON30038

Authier, J.-Y. (1993). Chapter IX: Processes, actor logics, and social change. In *The life of a place: A Vieux-Lyon neighborhood through time* (pp. 237-246). Lyon University Press. https://doi.org/10.4000/books.pul.9137

Baghdjian, F. (2014). *The logic of action of organized employer actors in Quebec: The case of provincial associations*. https://papyrus.bib.umontreal.ca/xmlui/handle/1866/10383

Bennafla, K. (2015). Featured concept: Informality. *Geoconfluences*. https://geoconfluences.ens-lyon.fr/informations-scientifiques/a-la-une/notion-a-la-une/notion-a-la-une-informalite

Berroir, S., Bouloc, C., Cattan, N., Fleury, A., Frétigny, J.-B., & Lassaube, U. (2016). The Eiffel Tower in your pocket: Informality and power in the construction of the tourist metropolis. *The Political Space: Online Journal of Political Geography and Geopolitics, 29*. https://journals.openedition.org/espacepolitique/3876

Boivin, J. (1979). Rules of the game and the balance of power in the Quebec public and parapublic sectors. *Industrial Relations, 34*(1), 3-21.

Bréchet, J.-P., & Schieb-Bienfait, N. (2011). Logic of action and project in collective action: Comparative theoretical reflections. *Finance Control Strategy, 14*(1), 101-129.

Bruner, J. S. (1990). *Acts of meaning*. Harvard University Press.

Bulle, S., & Tarragoni, F. (2021). *Sociologie du conflit*. Armand Colin.

Chenal, J. (2009). *Urbanization, urban planning, and city models in West Africa*. EPFL. https://infoscience.epfl.ch/record/128805

Coquery, M. (1997). Urban planning and food distribution in Africa. *"Food into Cities" Collection*. FAO.

Costes, L. (2010). Henri Lefebvre's "Right to the City" : What political and scientific legacy? *Spaces and Societies, 140*(1), 177-191.

Crozier, M., & Friedberg, E. (1977). *Actors and systems: The constraints of collective action*. Éditions du Seuil.

Domergue, M. (2003). "Structural adjustment policies are the key to growth and prosperity for developing countries." In *A short guide to common economic misconceptions* (pp. 73-81). The Discovery. https://doi.org/10.3917/dec.econo.2003.01.0073

Doussot, S., & Themines, J.-F. (2016). Using the social sciences to conceptualize actors within social science didactics. In J.-F. Themines & S. Doussot (Eds.), *Actors and action: Perspectives on the didactics of history and geography* (pp. 7-31). Caen University Press. https://hal.science/halshs-01741295/

Durand-Lasserve, A. (1986). *The exclusion of the poor in Third World cities*. L'Harmattan.

Gomis, J. S., Sow, D., & Sall, O. (2019). Genesis and expressions of informality in West-African cities. *Journal of Social Sciences*.

Grossman, E. (2014). Actor. In *Dictionary of public policy* (Vol. 4, pp. 31-38). Sciences Po Press. https://doi.org/10.3917/scpo.bouss.2014.01.0031

Hilgers, M. (2007). Conflicts surrounding the history of Koudougou (Burkina Faso). *Cahiers d'Études Africaines, 47*(186), 313-344.

Hilgers, M. (2008). Urban policies, contestation, and decentralization: Land subdivision and social representations in Burkina Faso. *Autrepart, 3*, 209-226.

Humain-Lamoure, A.-L., & Laporte, A. (2017). *Introduction à la géographie urbaine*. Armand Colin. https://www.cairn.info/introduction-a-la-geographie-urbaine--9782200602420.htm

National Institute of Statistics and Demography. (2022). *Fifth general population and housing census of Burkina Faso: Summary of final results* (2nd ed.).

Inverses, C., Morelle, M., Jacquot, S., Tadié, J., Bautès, N., Bénit-Gbaffou, C., Maccaglia, F., Rivelois, J., & Sierra, A. (2016). Political informality in the city: Eight researchers and nine cities confronting modes of urban governance. *The Political Space: Online Journal of Political Geography and Geopolitics, 29*. https://journals.openedition.org/espacepolitique/3806

Koissy, K. Y. S., Joseph, K. K., & Hyacinthe, K. K. (2017). Wartime neighborhoods in Korhogo: Between land disputes and the struggle for integration. *Revue de Géographie de l'Ouest*, 205. https://revuegeographieouaga.com/wp-content/uploads/2023/07/03_RGO_205_VMP1_val.pdf

Lajugie, J. (1985). Foreword: Decentralization and regional planning. *Directory of Local Authorities, 5*(1), 1-7.

Laurence, F., & Florence, W. (2010). *The paradoxes of the informal economy: Who benefits from the rules?* KARTHALA.

Lecourt, A. (2003). A geographic analysis of community conflicts related to transportation infrastructure: A theoretical and practical analysis based on the case of Brittany. *Les Cahiers Nantais, 60*, 163-166.

Legros, O. (2008). *Perspectives on urban dwellers' participation in public action*. Adels & Éditions Yves Michel. https://shs.hal.science/halshs-00784997/

Loubet, L., & Serry, A. (2020). Stakeholder strategies and territorial development in medium-sized port cities: The case of Le Havre and Klaipeda. *Journal of Regional and Urban Economics, 4*, 635-654. https://doi.org/10.3917/reru.204.0635

Marc, E., & Picard, D. (2015). Conflict and relationship. *Journal of the French Gestalt Society, 1*, 129-142.

Maroy, C. (1990). Actor strategies and logics of action within a vocational training institution. *Sociological Research, 21*(3).

Mcfarlane, C. (2016). Rethinking informality: Politics, crises, and the city. *Relations sociales et politiques, 76*, 44-76. https://doi.org/10.7202/1037065ar

Mermet, L. (1992). *Stratégies pour la gestion de l'environnement: La nature comme jeu de société?* https://www.torrossa.com/gs/resourceProxy?an=5130484&publisher=FZ2990

Ministry of Housing and Urban Planning. (2012). *Master plan for land use and urban planning for the city of Koudougou: 2030 horizon*.

Moussa, F. (2021). *Restructuring of informal housing, case study: Makhloufi neighborhood, city of Cheria* [Doctoral dissertation]. http://dspace.univ-tebessa.dz:8080/jspui/bitstream/123456789/6717/1/Restructuration%20de%20l%E2%80%99habitat%20informel%2C.pdf

Olson, M. (1965). *The logic of collective action: Public goods and the theory of groups*. Harvard University Press.

Osmont, A. (1995). *The World Bank and cities: From development to adjustment*. Karthala Editions.

Rode, S. (2017). The design of urban development projects as a collective process. *Espaces et Sociétés, 171*(4), 145-161.

Partoune, C. (2010). *Understanding the logic of the actors*. https://orbi.uliege.be/handle/2268/107922

Ribot, J. C. (1999). Decentralisation, participation and accountability in Sahelian forestry: Legal instruments of political-administrative control. *Africa, 69*(1), 23-65.

Rivelois, J. (1986). *The social dimension of urban planning* [Doctoral dissertation, 3rd cycle, History and Civilisations, École des Hautes Études en Sciences Sociales]. https://pascal-francis.inist.fr/vibad/index.php?action=getRecordDetail&idt=12080987

Robineau, O. (2014). Unplanned neighborhoods: Spaces of the "in-between" in the Burkinabe city. *Cahiers de Géographie du Développement, 7*. https://journals.openedition.org/cdg/478

Sébastien, L., & Paran, F. (2006). The 4-dimensional actor: A social and heritage-based exploration of regional stakeholder dynamics. In *Decision support for regional planning: Methods and tools* (pp. 213-240).

Sory, I. (2016). At the heart of the political issues surrounding land subdivision projects in Ouagadougou. In C. Y. Koffié-Bikpo (Ed.), *Spaces and tensions in Sub-Saharan Africa* (pp. 323-346). European University Press.

Sory, I. (2017). From strategic planning to the right to the city. In G. Fauveaud (Ed.), *Non-Western cities: Perspectives from young researchers* (pp. 105-114). University of Montreal Press.

Sory, I. (2019). Urban planning and stakeholder perspectives: Toward a reconfiguration of center–periphery relationships. *LARDYMES Geography Journal*, 23, 281-291.

Subra, P. (2012). Geopolitics: Singular or plural? The role, stakes, and tools of local geopolitics. *Hérodote, 3*, 45-70.

Tingbé-Azalou, A. (2015). *The proliferation of land subdivision operations in Beninese municipalities: An actor strategy for the quiet misappropriation of land plots?* https://www.revues-ufhb-ci.org/fichiers/FICHIR_ARTICLE_1946.pdf

Toniolo, A.-M. (2009). Behavior: Between perception and action, a concept to be rehabilitated. *L'Année psychologique, 109*(1), 155-193.

Torre, A. (2018). The drivers of territorial development. *Journal of Regional and Urban Economics, 4*, 711-736.

Villeneuve, P., Pelletier, M., & Thériault, M. (2009). The social dynamics of urban neighborhoods: A methodological essay. *Space Populations Societies, 2009*(1), 135-148.

Watson, V. (2014). African urban fantasies: Dreams or nightmares? *Environment and Urbanization, 26*(1), 215-231. https://doi.org/10.1177/0956247813513705

Yamane, T. (1967). *Statistics: An introductory analysis* (2nd ed.). Harper & Row.

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MOA Antecedents of Sustainable Ecotourism Development

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ABSTRACT

This research aims to find out the relationship between the three variables: motivation, opportunity and ability (MOA) with the participation of the indigenous community in the process of creating sustainable ecotourism development. A quantitative cross-sectional survey was conducted with 113 members of the Jahai indigenous community in Kampung Sungai Tiang and Kampung Sungai Kejar located in the Royal Belum State Park (RBSP), Malaysia. Partial least squares of structural equation modelling and importance-performance map analysis were used to analyse the data. Motivation was not a significant factor in influencing the level of participation of the indigenous community members in RBSP as opportunity and ability were strong and significant positive predictors of indigenous community participation. Moreover, indigenous community participation was ascertained as a strong predictor of sustainable ecotourism development (SED) and was found to significantly mediate the relationships between both opportunity and ability and SED. The findings caution against treating indigenous participation as a motivational problem. The central policy challenge in RBSP is structural, in that the Jahai community needs genuine opportunities, participatory structures, access to training, financial assistance and the freedom to make decisions which will allow them to enable the immense potential of ecotourism to turn into realistic ecotourism results. The study contributes to the MOA model in an indigenous ecotourism context and suggests an Opportunity-Ability-Participation Sustainable Ecotourism Development (OAP-SED) Framework as a

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practical avenue towards indigenous participation and livelihood improvement via cultural resilience and biodiversity conservation.

Keywords: Indigenous community participation, Life on Land (SDG 15), MOA model, Royal Belum State Park, sustainable ecotourism development

INTRODUCTION

The developmental image of tourism is not taken for granted anymore. However, despite being one of the biggest foreign exchange earners in the country, the growth of this sector has been less defensible in the face of ecological costs and inequitable community benefits (Gidebo, 2023). This predicament has become more apparent in recent crises as tourism is sensitive to both external shocks and climate change and fluctuating demand while benefits from tourism are often reaped by those close to capital, infrastructure and policymaking (Bahamonde-Rodríguez et al., 2023; Teo et al., 2025;). Mass tourism in many tourism destination sites has exacerbated the negative impacts of tourism on vulnerable ecosystems, while offering them limited benefits, particularly for marginalised local communities (Ivasciuc & Ispas, 2023; Prayitno et al., 2024). Sustainable tourism and ecotourism have thus become not just a feasible alternative but a long-term solution of a tourism model that has in the past often detached economic growth from ecological care and social justice (Gidebo, 2023; Gomes & Lopes, 2023). Xu et al. (2022) and Yanying et al. (2026) stated that it only works when all three conservations, community welfare and cultural protection are used in tandem as opposed to being mentioned individually in policy debates. Recent systematic reviews in rural tourism highlighted an increasing attention to the valorisation of rural areas, with the focus on intangible cultural heritage because if no direct economic upliftment is achieved, the ecotourism model often fails (Ramli & Kamal, 2026; Zhang et al., 2025).

This contradiction is most evident in Malaysia. According to Teo et al. (2025), tourism contributed RM86.1 billion in receipts in 2019 prior to the Covid-19 pandemic but the pandemic has led to a decline in tourism receipts, which fell to RM0.23 billion in 2021. This has created an increased interest in community and nature-based tourism, specifically in protected areas such as the Royal Belum State Park (RBSP) in Perak. At 117,500 ha, RBSP is part of a tropical rain forest system that is believed to be approximately 130 million years old which is around the same age as the Amazon and Congo basins. It also home to endangered species such as the Malayan tiger, Asian elephant (Gwee et al., 2019; Schwabe et al., 2015; Zhang et al., 2025). It does not have a negligible conservation economy as the annual direct non-consumptive recreational value of the park is estimated at RM14.66 million, with future cash flows of up to RM1.86 billion over the next century (Gwee et al., 2019). These numbers are a testament to RBSP's

ecological and economic importance. However, the more critical questions of development which are "Who is involved in creation of this value" and "Who is enjoying it?" are not addressed.

Such questions matter because RBSP is not merely a protected rainforest. It is also an indigenous landscape. The Malaysian indigenous people (Orang Asli) including the Jahai community have long inhabited these forests which are a source of their livelihood, vivid memories, cultural practice and ecological knowledge (Hamid et al., 2025; Kadir & Ni, 2024). Treating RBSP only as a conservation asset risk erasing the vast knowledge of the people whose relationship with the forest predates tourism planning and protected-area administration. Schwabe et al. (2015) postulated that earlier conservation and tourism arrangements have often restricted indigenous access to land, agriculture and forest resources, producing a familiar paradox. Similarly, Gidebo (2023) posited that indigenous communities are expected to support conservation, but they are normally not allowed to contribute their opinion to the formulation of conservation and tourism policies. For the Jahai community, the issue is not simply whether ecotourism exists in RBSP. The issue is whether participation is meaningful enough to include planning, decision-making, implementation, and benefit-sharing (Kadir & Ni, 2024). The literature has also not fully resolved this problem. Tourism studies have repeatedly affirmed that community participation is essential for sustainable tourism and ecotourism (Kim et al., 2021; Oleśniewicz et al., 2020). Nevertheless, the antecedents of participation, especially in indigenous and highly regulated protected-area contexts, remain inexplicable.

This study uses the Motivation-Opportunity-Ability (MOA) model as the conceptual platform because it is a model that explains participation as a result of internal disposition, external access, and practical capacity. The original behavioural version of the model involved views the three components of motivation, opportunity and ability as conditions that affect whether a person processes information and then acts accordingly (Batra & Ray, 1986; MacInnis et al., 1991; Ölander & Thøgersen, 1995). Subsequently, Hung et al. (2011) applied this rationale to the tourism domain, suggesting community participation is dependent on the extent to which people are willing to participate, allowed to participate, and able to participate. This tripartite logic is still useful and has been reiterated in recent tourism studies. Dong et al. (2024) discovered that farmers' intention to engage in agricultural heritage tourism was driven by opportunity and ability. On the same basis, Fan et al. (2024) revealed that the conditions of motivational, institutional, and capacity influenced the environmental governance of rural tourism residents. In the same vein, Xu et al. (2022) posited that MOA is a helpful lens to view community-based tourism behavior as motivation, opportunity and ability are significant factors driving farmers' participation and livelihood outcomes. Additionally, specific conditions,

especially opportunity, has been deemed to be necessary or "must-have" prerequisite for achieving functional outcomes by incorporating advanced methodologies such as Necessary Condition Analysis (NCA) with MOA and combined importance-performance map analysis (IPMA) (Hauff et al., 2024).

It is useful to differentiate between three conditions that are often confusing: willingness to participate, access to participative channels and the capacity to engage effectively (Dong et al., 2024; Fan et al., 2024; Hung et al., 2011; Nilsson & Ek Styvén, 2025). However, there is not enough empirical research to verify the functioning of these antecedents among indigenous communities in the Malaysian ecotourism context, especially in the RBSP landscape (Hamid et al., 2025; Kadir & Ni, 2024). There is another weakness which is conceptual. Participation is often assumed as the ultimate goal, instead of the means by which the conversion of "Motivation, Opportunity and Ability" to sustainable ecotourism outcomes occurs.

The originality of this study comes out of an effort to correct this conceptual gap. This research is an extension of previous MOA-based research on tourism by theoretically placing indigenous community participation in the middle ground as a seemingly mediating mechanism and not simply as a final outcome. It puts forward the view that the psychological and structural factors (motivation, opportunity, ability) that underline a learning phenomenon which is only activated when they are deliberately tapped through the active, participatory role of the host community. This is the structural redirection to make sure that the MOA framework represents the sequential reality of indigenous community empowerment (Situmorang et al., 2026).

The purpose of this article is to fill this gap by combining the model of Hung et al. (2011) (MOA) and the theory of community participation proposed by Tosun (2006) to elucidate what can be expected from the indigenous community members in sustainable ecotourism development. Therefore, this study's objectives are:

i. To investigate how motivation, opportunity and ability influence the participation of indigenous community in Royal Belum State Park;
ii. To evaluate direct impacts of motivation, opportunity, ability and indigenous community involvement on sustainable development of ecotourism; and
iii. To evaluate the role of indigenous community participation as a mediator between the MOA antecedents and sustainable development of ecotourism.

This paper's contribution lies in adapting the MOA model in a Malaysian ecotourism context and it also tests the indigenous community participation not as an outcome, but also as a mediator. Moreover, the study provides insights to guide authorities and policy makers on how to transform the immense potential of ecotourism to sustainable tourism development.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Theoretical Foundations

For the current study, “motivation” is the perceived benefits of the Jahai community in engaging with ecotourism and the willingness and readiness by the Jahai community to engage with ecotourism (Fan et al., 2024). “Opportunity” encompasses institutional openness, communication channels, participation opportunities as well as the extent to which RBSP governance allows the indigenous community to influence planning and implementation (Kadir & Ni, 2024). The elements of knowledge, awareness, skills, training and access to resources are associated with “Ability” (Dong et al., 2024). These dimensions are viewed as enablers for indigenous participation, which is defined as active participation in consultation, decision-making, implementation and benefit-sharing. This definition is more robust than merely attending tourism programmes, as participation without influence might easily be considered as tokenism (Gidebo, 2023; Kim et al., 2021; Yanying et al., 2026). The ladder of citizen participation, as developed by Arnstein (1969) is useful here in distinguishing between various levels of consultation, ranging from symbolic to the distribution of power and Tosun's (1999, 2006) typology on tourism participation is particularly relevant in protected-area and developing-country settings, where communities are often asked to endorse tourism but not necessarily to influence it. Advanced methodologies such as Necessary Condition Analysis (NCA) integrated with MOA and combined importance-performance map analysis (IPMA) have further proven that specific conditions, particularly opportunity, act as mandatory "must-have" prerequisites for generating functional outcomes (Hauff et al., 2024). Sustainable ecotourism development is the dependent variable. It is not "economic growth" but the perceived positive impacts on economic, socio-cultural and environmental aspects. Some scholars have stated the dire need of the link between community empowerment and cultural heritage conservation in sustainable tourism (Yanying et al., 2026) while others identified the potential of available information for sustainability to spur more responsible tourist behaviours (Gomes & Lopes, 2023).

Drawing upon Scheyvens's Empowerment Framework and the Triple Bottom Line (TBL) approach, true sustainability mandates that economic generation, cultural revitalisation and environmental conservation operate symbiotically (Bašan et al., 2025; Scheyvens & van der Watt, 2021). Actual sustainability requires economic generation, cultural revitalisation and environmental conservation working in symbiosis (Bašan et al., 2025; Scheyvens & van der Watt, 2021) and is built on the Empowerment Framework proposed by Scheyvens (1999) and the Triple Bottom Line (TBL) approach. Gidebo (2023) also suggested that community-based tourism offers an opportunity to link biodiversity conservation and livelihoods to protected areas. This

understanding is essential for RBSP as this is a conservation landscape and an indigenous community landscape. Although there is significant ecological and recreational value in RBSP, it does not necessarily imply that the Jahai community has a meaningful role in creating and managing this value (Gwee et al., 2019; Ramli & Kamal, 2026; Zhang et al., 2025).

MOA Antecedents of Indigenous Community Participation and Sustainable Ecotourism Development

In general, it is expected that motivation will promote participation as community members are more likely to participate if tourism is perceived as beneficial, meaningful, and consistent with the community's interests. The assumption has been substantiated by recent studies. Weak motivation was identified as a constraint to pro-environmental tourism behaviour among Gen Z tourists by Nilsson and Ek Styvén (2025) while Ivasciuc and Ispas (2023) revealed that pertaining to lifestyle values and local resources, intrinsic motivation can be a driver for sustainable tourism entrepreneurship. For community settings, motivation can be desired income, pride in their culture, improvement of their livelihood or conservation concern. Motivation could thus be both formal economic benefit and the desire to have ecotourism value the ecological and cultural knowledge of the Jahai community.

Motivation may also influence sustainable ecotourism development directly. Communities that perceive ecotourism as beneficial, culturally compatible and economically useful may evaluate its outcomes more positively (Yanying et al., 2026). However, motivation is not essentially adequate. Kadir and Ni (2024) opined that community participation in rural tourism development was not mediated by motivation, indicating that a positive attitude might not lead to development outcomes in the absence of other strong factors. By the same token, Dong et al. (2024) delineated that motivation did not significantly affect farmers' willingness to participate in agricultural heritage tourism, whereas opportunity and ability did. This makes it necessary to test motivation as a predictor of participation and as a direct predictor of sustainable ecotourism development. Thus, the developed hypotheses are:

H1 : Motivation has a significant positive effect on indigenous community participation in RBSP.

H2 : Motivation has a significant positive effect on sustainable ecotourism development in RBSP.

Opportunity is the most political aspect of the MOA model. It concerns not only the existence of tourism activities but whether indigenous communities are granted access to planning, consultation, proposal submission, programme implementation and decision-making. Recent studies indicated the paramount importance of this distinction. Fan et al. (2024) revealed that opportunity factors act as catalysts for residents' participation in rural tourism

environmental governance, while Tang et al. (2022) opined that participation opportunity significantly improves tourists' pro-environmental behaviour. In protected tourism destination sites, opportunity is even more sensitive because state agencies, park authorities and private operators often hold the legal and financial authority over tourism development. D'Arco et al. (2021) established that weak governance in tourism sites that are protected undermines sustainable tourism development because local authorities are not sufficiently engaged in decision-making.

Consequently, opportunity should affect both indigenous community participation and sustainable ecotourism development. If the Jahai indigenous community members are involved in planning, evaluation and programme design, their environmental knowledge and cultural priorities can be translated into tourism practices that are locally acceptable and ecologically responsible. In Malaysia, Kadir and Ni (2024) determined that MOA conditions remain important for rural tourism participation while Hamid et al. (2025) suggested that community resources are pertinent for sustainable indigenous tourism. On an international scale, studies from South Africa's Vhembe District demonstrate that rural tourism as a Local Economic Development (LED) strategy entirely hinges on the structural opportunities provided by local government facilitation (Ramukumba, 2024). Similarly, in Latin American countries, the lack of spatial opportunity often truncates the integration of cultural and biodiversity richness, stalling the realisation of biocultural ecotourism (Echeverri et al., 2025). For RBSP, opportunity is expected to operate as the bridge between governance structures and indigenous community members' actions. Hence, the developed hypotheses are:

H3 : Opportunity has a significant positive effect on indigenous community participation in RBSP.

H4 : Opportunity has a significant positive effect on sustainable ecotourism development in RBSP.

Ability refers to the capacity to participate effectively. It includes awareness, knowledge, skills, training, access to information, and financial resources. Recent MOA-based tourism work has repeatedly shown that capacity is not secondary. Xu et al. (2022) revealed that ability significantly influenced farmers' tourism participation while Kadir and Ni (2024) identified ability as a significant mediator in rural tourism development. Jiao and Wang (2025) used MOA theory in a pro-environmental tourism setting concluded that ability-related conditions such as environmental awareness and green self-efficacy elucidate behavioural outcomes. The outcome has palpable consequences for indigenous ecotourism as indigenous community members might considerable cultural and ecological knowledge, but they still need the fundamental tourism skills specifically guiding, managing safety, hospitality, financial literacy and digital marketing. Empirical evidence divulged that financial

literacy and financial behaviour are the core factors that determine the sustainability of SMEs in indigenous communities and directly reduce the enterprise failure risk (Molosiwa & Holland, 2025).

Ability can also directly influence the development of sustainable ecotourism. A trained, informed and resourced community can help with visitor interpretation, cultural presentation, conservation practice and local enterprise. Nevertheless, ability is not necessarily development. Exclusion of a knowledgeable community in planning results in ineffective policies and a low level of community participation while a trained community with no institutional access may be limited to lower-level operational positions. Therefore, ability needs to be assessed in both its direct impact and its impact via participation. Therefore, the developed hypotheses are:

H5 : Ability has a significant positive effect on indigenous community participation in RBSP.

H6 : Ability has a significant positive effect on sustainable ecotourism development in RBSP.

Indigenous Community Participation's Role in Sustainable Ecotourism Development

Community participation is a fundamental element of sustainable tourism as the success of community support. Knowledge and accountability are key factors in ascertaining whether tourism development is legitimate, durable, and environmentally responsible. Kim et al. (2021) delineated that resident participation contributes to enhancing the attitude toward tourism development while Prayitno et al. (2024) posited that social networks, trust and community norms are supporting factors in strengthening sustainable tourism development especially in tourism protected areas. Gidebo (2023) opined that community-based tourism has the potential to link livelihoods with conservation of biodiversity but not when it is outside of the governance of protected areas because this creates conflict and undermines conservation results. On the same basis, Oleśniewicz et al. (2020) denoted that national parks need to be responsibly managed, visitors need to be regulated, and conservation plans need to be implemented.

In indigenous ecotourism, involvement should not be limited to merely work or culture. It is more significant when communities are involved in decision making, there is a consensus of what is acceptable cultural expression, customary knowledge is safeguarded, and benefits are shared equitably. Yanying et al. (2026) accentuated the need for a greater linkage between cultural heritage preservation and community empowerment in sustainable tourism. In the context of Malaysian indigenous tourism, Hamid et al. (2025) stated that community resources play a crucial part in sustainable indigenous tourism. This is reflected via the successful case studies in the Global South, where co-management and participatory integration were effectively implemented and directly led to revitalisation of intangible cultural

heritage and local economies such as the Wiwa Indigenous Tourism and cultural programmes in Tanzania (Giandomenico, 2025). Thus, the mechanism for ecotourism to be economically useful, culturally respectful, and environmentally grounded is based on the participation level of the Jahai community in RBSP. Hence, the developed hypothesis is:

H7 : There is a significant impact of indigenous community participation on sustainable ecotourism development in RBSP.

An immediate consequence of the MOA framework is the mediation effect. Favourable conditions of motivation, opportunity and ability must be present if sustainable ecotourism outcomes are to be achieved, but it is not a foregone conclusion. They must be converted into concrete participation before they can shape planning, implementation, and benefit distribution. Xu et al. (2022) provided empirical support for this logic by revealing that tourism participation links MOA conditions to livelihood outcomes. Similarly, Kadir and Ni (2024) postulated that ability works through participation in rural tourism development while Dong et al., (2024) suggested that opportunity and ability can be more consequential than motivation in heritage tourism participation. In this study, indigenous community participation is thus not a decorative mediator. It is a process through which willingness, accessibility, and capacity become essentially significant. Therefore, the developed hypotheses are:

H8 : Indigenous community participation mediates the relationship between motivation and sustainable ecotourism development in RBSP.

H9 : Indigenous community participation mediates the relationship between opportunity and sustainable ecotourism development in RBSP.

H10 : Indigenous community participation mediates the relationship between ability and sustainable ecotourism development in RBSP.

METHODOLOGY

This study was conducted using a quantitative, cross-sectional survey design to examine the theory-specified model that includes Hung et al. (2011) MOA model, indigenous community participation and sustainable ecotourism development in RBSP. The design follows a positivist explanation-prediction method because the study examines hypothesised relationships among latent constructs using perceptual survey data and multivariate modelling rather than producing an ethnographic account of the Jahai tribe life (Hair et al., 2022; Saunders et al., 2023). The Jahai community members represent the unit of analysis as the constructs are related to perceptions of ecotourism benefits, participation access, ability to participate, community involvement and sustainable ecotourism outcomes. The respondents of the study were the Jahai indigenous community members living in RBSP. The accessible population was based on two



Figure 1. Location of Royal Belum State Park featuring the selected Jahai settlements (Zhang et al., 2025)

permanent settlements, Kampung Sungai Tiang and Kampung Sungai Kejar.

Figure 1 shows that both villages have year-round residents, active interfaces with ecotourism activities, and direct relevance to park-related participation. Kamal (2020) divulged that the accessible population consisted of about 158 residents comprising 75 from Kampung Sungai Kejar and 83 residents from Kampung Sungai Tiang.

The final sample sizes were the respondents in Kampung Sungai Tiang (60 respondents) and Kampung Sungai Kejar (53 respondents) based on purposive sampling. This distribution of respondents is a proportional representation of both villages. The sample size was justified based on the recommendation of Krejcie and Morgan (1970) for a known population of approximately 160 and further justified using G Power with a priori estimation based on a medium effect size, 0.05 alpha level, 0.90 statistical power and four main predictors of the structural model (Faul et al., 2009). A rigorous non-probability purposive sampling method was used in the study. Random sampling is a statistical ideal, but it is methodologically necessary and well-justified in field research conducted with hard to reach, marginalised rural and or indigenous populations. Structured probability sampling in geographically distant regions where workforce is highly mobile would have an insurmountable logistical bias as targeted purposive selection ensures that only indigenous community members who have lived through the phenomenon of ecotourism will be surveyed. The participant selection criteria were that the respondents must be adult members

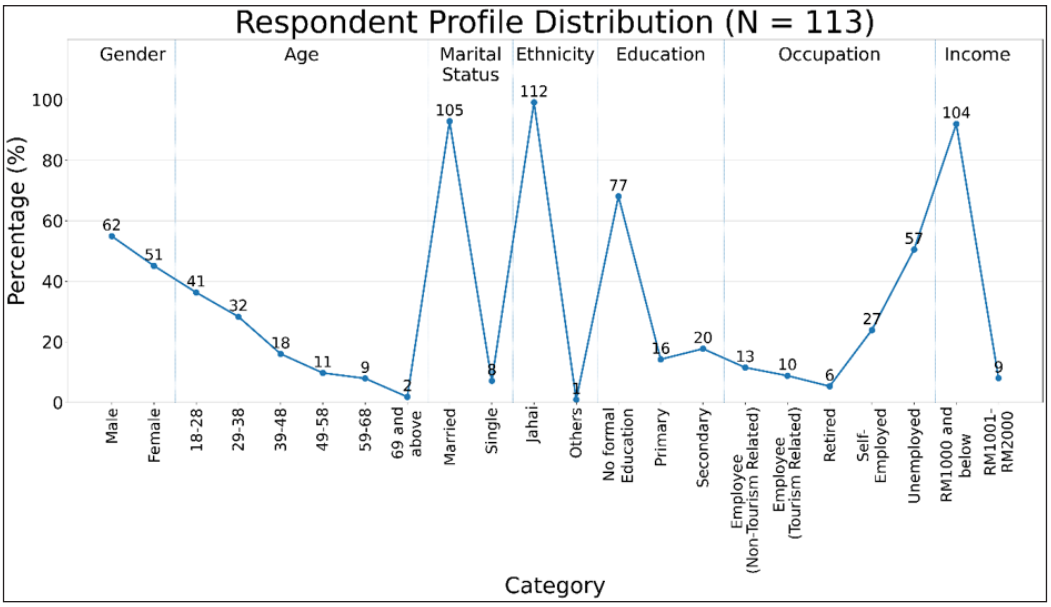

Figure 2. Respondents' profile distribution (Authors' Computation, 2026)

of the Jahai community tribe who were actively or passively involved in the tourism industry in the state park. Ethical approval was formally obtained before deployment in the field, while informed consent was obtained through verbal confirmation with the presence of local community leaders (Jameel et al., 2025). Figure 2 shows the respondents' profile distribution.

From Figure 2, it can be concluded that the respondents' profile is heavily skewed towards the Jahai community, having 112 respondents (99.1% of the respondents). Male respondents slightly outnumbered the female respondents, and the majority of respondents were in the age group 18-38 years. Most of the respondents were married (105). There is a very low level of education, with the majority of the respondents indicating that they had no formal education. Unemployment was the largest occupation, followed by self-employment. Income distribution was also a reflection of economic vulnerability as there were 104 respondents who earned RM1000 or less. The profile confirms that the study depicts a predominantly low-income and place-bound Jahai community.

A structured questionnaire was used for data collection. All constructs were measured with multi-item scales that were adapted with a five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. The items were taken from the sources listed in Table 1 and adapted to suit the Jahai and RBSP ecotourism context but maintained the original conceptual domains.

Common method bias was controlled by using procedural and statistical remedies

Table 1
Measurement constructs, acronyms and sources of items

Construct	Acronym	Measurement focus	Number of items	Sources
Motivation	MOT	Perceived benefits, readiness and willingness to engage in ecotourism	5	Hung et al. (2011)
Opportunity	OPT	Participation access, planning involvement, programme participation and ability to influence ecotourism development	7	Rasoolimanesh et al. (2017); Kunasekaran et al. (2022)
Ability	BLTY	Resources, training, knowledge and skills needed for ecotourism participation	5	Rasoolimanesh et al. (2017); Kunasekaran et al. (2022)
Indigenous Community Participation	ICP	Consultation, communication, equal opportunity, commitment and participation capacity	6	Arnstein (1969); Tosun (1999); Kunasekaran et al. (2022)
Positive Economic Impacts	EI	Income, employment, business opportunities and local economic benefits from ecotourism	5	Yoon et al. (2001); Rasoolimanesh and Jaafar (2016); Kunasekaran et al. (2022)
Positive Socio-Cultural Impacts	SC	Cultural preservation, community pride, social interaction and socio-cultural benefits from ecotourism	4	Yoon et al. (2001); Rasoolimanesh and Jaafar (2016); Kunasekaran et al. (2022)
Positive Environmental Impacts	EN	Environmental conservation, ecological awareness and protection of natural resources through ecotourism	4	Yoon et al. (2001); Rasoolimanesh and Jaafar (2016); Kunasekaran et al. (2022)
Sustainable Ecotourism Development	SED	Higher-order outcome represented by EI, SC and EN	13	Yoon et al. (2001); Rasoolimanesh and Jaafar (2016); Kunasekaran et al. (2022)

due to data being taken from a single survey instrument. Procedurally, respondents were told that participation was voluntary and confidential and questions were worded to minimise socially desirable responses and response pressure (Podsakoff et al., 2012; Jordan & Troth, 2020). The variance inflation factors (VIF) of the full collinearity were checked as a diagnostic for common method bias (CMB) statistically. Common method bias is not likely to bias the model estimates if full VIF values are less than the conservative threshold of 3.3 (Kock, 2015).

Since the study is prediction-oriented, tests for mediation include multiple latent constructs with a modest sample size (Hair et al., 2022; Sarstedt et al., 2021). The data were analysed using Partial Least Squares Structural Equation Modeling (PLS-SEM). It is the statistical robustness

in handling small sample data that does not meet the strict distributional assumptions which have led to the intense prominence of PLS-SEM in complex socioeconomic models (Hauff et al., 2024). Additionally, Sustainable Ecotourism Development (SED) was operationalised as a higher-order construct. This echoes the conceptual fact that economy, socio-cultural and environmental effects are unique and cannot be interchanged as they do combine to build sustainability. To be able to model this without the loss of the conceptual specificity of the lower-order dimensions, the disjoint two-stage approach was used. This two-stage procedure involves an explicit separation of the lower-order latent variable scores at the first stage, followed using these scores as indicators at the second stage and thus, creating a mathematically valid formative construct (Sarstedt et al., 2024).

Given that SED was modelled using its three dimensions (EI, SC and EN), the disjoint two-stage approach as recommended by Sarstedt et al. (2019) was used to estimate the higher order construct but retain the conceptual distinctness of the lower-order dimensions. Since SED was modelled through its three dimensions: EI, SC and EN, the disjoint two-stage approach in line with Sarstedt et al. (2019) was applied to estimate the higher-order construct without losing the conceptual distinctiveness of its lower-order dimensions.

The measurement model was assessed through indicator reliability, internal consistency reliability, convergent validity, discriminant validity, and collinearity. Cronbach's alpha, Dijkstra-Henseler's ρA and composite reliability (ρC) assessed internal consistency; average variance extracted (AVE) assessed convergent validity while The Heterotrait-Monotrait ratio (HTMT) and the Fornell-Larcker criterion established discriminant validity (Fornell & Larcker, 1981; Henseler et al., 2015). The structural model was evaluated using path coefficients, t-values, p-values, confidence intervals, R^2, direct effects and indirect effects. Bootstrapping with 10,000 resamples tested path and mediation significance (Hair et al., 2022). Predictive relevance and predictive performance were examined using PLS prediction and Cross-Validated Predictive Ability Test (CVPAT) (Liengaard et al., 2021; Shmueli et al., 2019). Furthermore, Importance-Performance Map Analysis (IPMA) identified practical improvement priorities (Ringle & Sarstedt, 2016; Hauff et al., 2024).

Descriptive Statistics and Correlations

Table 2 illustrates that motivation recorded the highest mean score (M = 4.25), followed by environmental impacts (M = 4.18) and socio-cultural impacts (M = 4.12). Ability recorded the lowest mean score (M = 2.93), suggesting that respondents perceived capacity, resources and training as more constrained than motivational readiness. This pattern is substantively important because it already points to a gap between positive orientation toward ecotourism and the practical capacity to participate in it. The strongest correlation involving

Table 2
Descriptive statistics and correlations

Construct	Mean	SD	MOT	OPT	BLTY	ICP	EI	SC	EN
MOT	4.25	0.61	1.00						
OPT	3.86	0.64	0.25**	1.00					
BLTY	2.93	1.12	0.09	0.51***	1.00				
ICP	3.64	0.79	0.09	0.64***	0.52***	1.00			
EI	3.89	0.66	0.28**	0.37***	0.22*	0.36***	1.00		
SC	4.12	0.66	0.32***	0.37***	0.05	0.37***	0.57***	1.00	
EN	4.18	0.68	0.27**	0.42***	0.14	0.29**	0.62***	0.74***	1.00

*Note***.** Stars (*) = *p < 0.05, **p < 0.01, ***p < 0.001. SD = Standard deviation
Source: Authors' Computation, 2026

indigenous community participation was with opportunity (r = 0.64, p < 0.001), followed by ability (r = 0.52, p < 0.001). Nonetheless, there was only a weak association between indigenous community participation and motivation. In the SED dimensions, there was a strong relationship between environmental and socio-cultural impacts, which indicates that environmental protection and cultural continuity are closely related in the Jahai context.

Measurement Model Assessment

The PLS-SEM algorithm output was examined in the first stage and the indicators were retained as well as the outer loadings and endogenous construct variance to ensure that they were in line with the suggested measurement model (Sarstedt et al., 2019) before assessing their reliability and validity. The measurement and structural configuration of the model assessment is shown in Figure 3.

Figure 3 shows that the retained indicators load satisfactorily on their respective constructs, with most outer loadings above acceptable thresholds. The model also explains 46.3% of ICP variance while EI, SC and EN show significant explained variance. These preliminary results suggest adequate model specifications. Therefore, detailed reliability, validity, and discriminant validity results are in Table 3.

Results of the measurement model indicate that the quality of the construct is satisfactory. Indicator loadings were between 0.66 and 0.90, indicating reliability of indicators for the retained items. All VIF values are below the conventional value of concern, suggesting that no collinearity problems existed in the measurement model. Cronbach's alpha, rho_A and composite reliability values exceeded 0.80 across constructs, confirming internal consistency. AVE values were above 0.50, which supports convergent validity. The square roots of AVE on the diagonal exceeded the corresponding lower-triangle correlations while HTMT values remained below the conservative 0.90 benchmark. Collectively, these results confirm that the constructs are

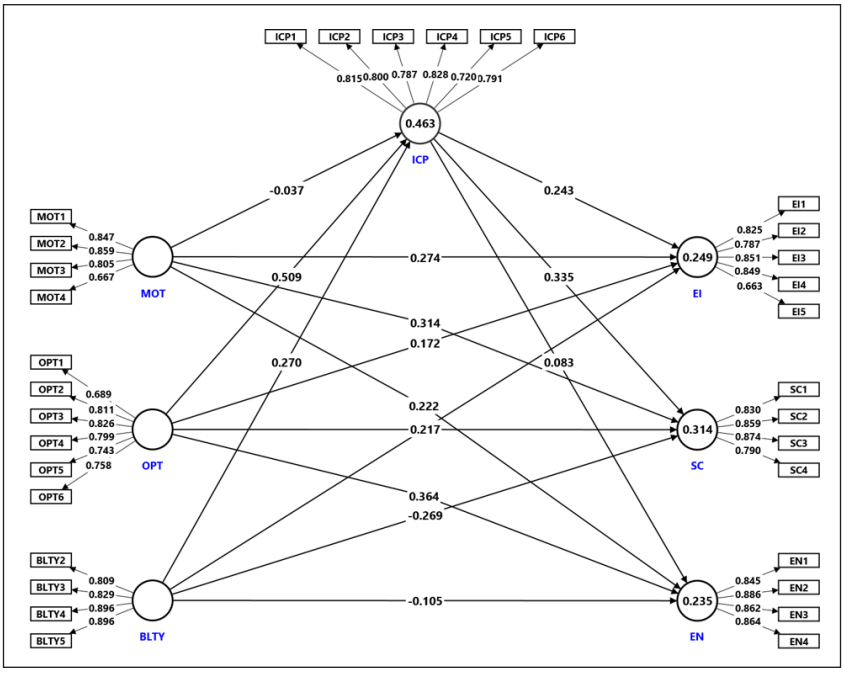

Figure 3. First stage measurement model (SmartPLS 4 output, 2026)

Table 3
Measurement model and discriminant validity

Construct	Loading	VIF	Cronbach's alpha	ρA	ρC	AVE	MOT	OPT	BLTY	ICP	EI	SC	EN
MOT	0.67–0.86	1.62–1.82	0.82	0.87	0.87	0.64	**0.80**	0.30	0.13	0.15	0.36	0.40	0.33
OPT	0.69–0.83	1.66–2.58	0.87	0.88	0.90	0.60	0.29	**0.77**	0.58	0.73	0.44	0.43	0.47
BLTY	0.81–0.90	2.53–2.77	0.88	0.92	0.92	0.74	0.12	0.52	**0.86**	0.58	0.25	0.11	0.17
ICP	0.72–0.83	1.79–2.37	0.88	0.88	0.91	0.63	0.14	0.64	0.53	**0.79**	0.42	0.42	0.33
EI	0.66–0.85	1.54–2.41	0.86	0.88	0.90	0.64	0.35	0.39	0.22	0.38	**0.80**	0.67	0.71
SC	0.79–0.87	1.82–2.43	0.86	0.86	0.90	0.70	0.39	0.38	0.06	0.37	0.58	**0.84**	0.84
EN	0.85–0.89	2.23–2.77	0.89	0.89	0.92	0.75	0.33	0.43	0.16	0.29	0.62	0.74	**0.87**

Note. Upper triangle = HTMT; diagonal = √AVE; lower triangle = Fornell-Larcker correlations.
Source: Authors' Computation, 2026

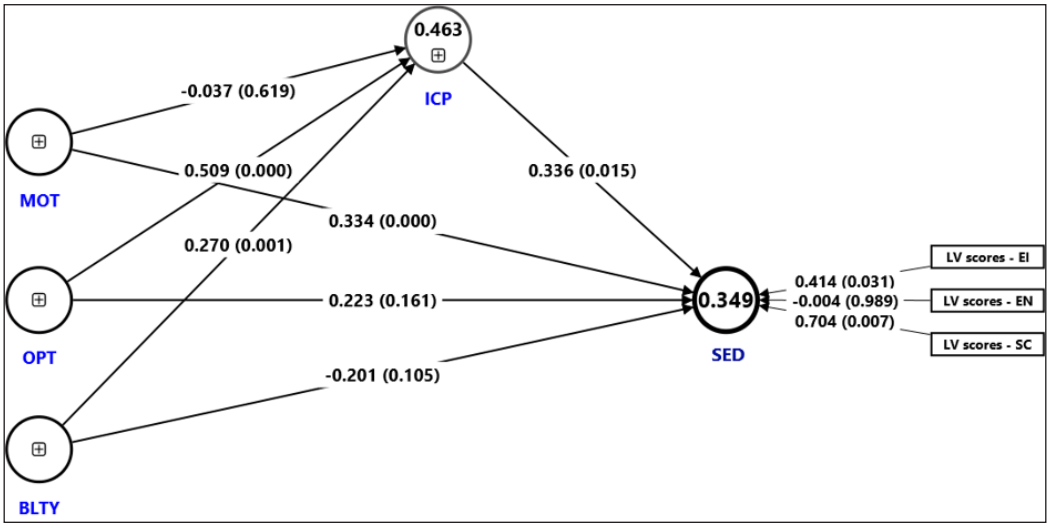

Figure 4. Second stage structural model (SmartPLS 4 output, 2026)

reliable, convergent, and empirically distinct enough for structural model assessment.

Structural Model and Hypothesis Testing

After confirming the adequacy of the measurement model in stage one, the structural model was examined in stage two, using the latent variables (LV) to evaluate the hypothesised direct and indirect relationships. Figure 4 presents the 10,000 resampled bootstrapped path coefficients, p-values, and explained variance for the endogenous constructs.

Figure 4 reveals opportunity and ability as significant predictors of indigenous community participation but not motivation. Sustainable ecotourism development is also significantly predicted by indigenous community participation. The model explains 46.3% of ICP and 34.9% of SED, suggesting moderate explanatory power. These visual results provide the foundation for formal hypotheses testing in Table 4.

Table 4 shows provide a sharper and more interesting result than a simple positive MOA model. Motivation did not significantly influence indigenous community participation (β = -0.037, p = 0.619). Therefore, H1 was not supported. However, motivation had a significant positive direct effect on sustainable ecotourism development (β = 0.334, p < 0.001), supporting H2. This indicates that favourable perceptions of ecotourism benefits may shape evaluations of sustainable development, but they do not necessarily influence the Jahai community into participatory action.

Opportunity significantly influenced indigenous community participation (β = 0.509, p < 0.001), supporting H3. However, opportunity did not significantly influence sustainable ecotourism

Table 4
Direct and mediating effects hypothesis testing

Hypothesis	Relationship	β	t-value	p-value	Decision
Mediating effects					
H1	MOT → ICP	-0.037	0.498	0.619	Not supported
H2	MOT → SED	0.334	3.706	<0.001	Supported
H3	OPT → ICP	0.509	5.489	<0.001	Supported
H4	OPT → SED	0.223	1.403	0.161	Not supported
H5	BLTY → ICP	0.270	3.415	0.001	Supported
H6	BLTY → SED	-0.201	1.620	0.105	Not supported
H7	ICP → SED	0.336	2.422	0.015	Supported
Mediating effects					
H8	MOT → ICP → SED	-0.012	0.433	0.665	No mediation
H9	OPT → ICP → SED	0.171	2.111	0.035	Full Mediation
H10	BLTY → ICP → SED	0.091	1.914	0.056	Full Mediation[+]

Note. = Marginal significance. Source: Authors' Computation, 2026

development directly (β = 0.223, p = 0.161), Therefore, H4 was not supported. Ability significantly influenced indigenous community participation (β = 0.270, p = 0.001), supporting H5 but its direct effect on sustainable ecotourism development was non-significant and negative (β = -0.201, p = 0.105). Hence, H6 was not supported. Finally, indigenous community participation significantly improved sustainable ecotourism development (β = 0.336, p = 0.015), supporting H7. Thus, the direct effects showed that opportunity and ability influence participation while motivation and participation affect SED. The outcome of the mediation corroborates this understanding. The indirect effect of 'Motivation on sustainable ecotourism development through the involvement of indigenous communities' was not significant (β = -0.012, p = 0.665). Therefore, H8 was not supported. The indirect effect of opportunity on sustainable ecotourism development via indigenous community participation was significant (β= 0.171, p= 0.035), thus supporting H9. The ability mediation path approached significance but did not meet the 0.05 threshold (β = 0.091, p = 0.056). Therefore, H10 was marginally supported. Substantively, this implies that "opportunity" and more cautiously "ability" are significant only when they are transformed into indigenous community participation.

Predictive Relevance, Explanatory Power and IPMA

Before assessing the practical implications of the model, predictive relevance and explanatory power were examined. The

Table 5
Predictive relevance, explanatory power and CVPAT tests

Endogenous construct	R^2	$Q^2_{predict}$	RMSE	MAE	PLS loss	IA loss	ALD	t-value	p-value
ICP	0.463	0.438	0.767	0.595	0.581	1.024	-0.443	3.784	<0.001
SET	0.349	0.218	0.909	0.681	0.829	1.017	-0.188	2.845	0.005
Overall					0.767	1.019	-0.252	4.101	<0.001

Note. ALD = average loss differences. Source: Authors' Computation, 2026

coefficient of determination was used to assess the model's explanatory capacity, while $Q^2_{predict}$, root mean square error (RMSE) and mean absolute error (MAE) were used to evaluate predictive relevance and prediction error as per the PLS-SEM prediction ability recommended by Shmueli et al. (2019) and Hair et al. (2022). Cross-validated predictive ability testing (CVPAT) was further applied to compare the PLS model against the indicator average (IA) benchmark as recommended by Liengaard et al. (2021). Table 5 presents the R^2, $Q^2_{predict}$, prediction error and CVPAT.

Table 5 denotes that the model explains 46.3% of the variance in indigenous community participation and 34.9% of the variance in sustainable ecotourism development. The values reflect a moderate level of explanatory power which is significant in the context of the social and institutional context of indigenous ecotourism. Predictive relevance was demonstrated because Q^2predict values were positive for both endogenous constructs. The CVPAT results are especially relevant in comparison with the average indicator benchmark of the PLS model. Losses for both ICP and SET were less for the PLS than the IA, and the differences in losses were negative and significant. This is to ensure that the model possesses satisfactory out-of-sample predictive power instead of merely in-sample explanatory power. Once the explanatory and predictive adequacy of the model has been established, the analysis was conducted using IPMA to identify which set of antecedents provides the most practical way to improve sustainable ecotourism development.

Figure 5 IPMA results show that opportunity has the highest importance for sustainable ecotourism development (importance = 0.394; performance = 60.620), followed by indigenous community participation (importance = 0.336; performance = 62.009) and motivation (importance = 0.321; performance = 67.476). Ability records the weakest position, with negative total importance and the lowest performance (importance = -0.111; performance = 48.284). The implication is clear. Although motivation performed the best, opportunity is the strongest improvement level. Therefore, the governing authority of RBSP, which is Perak State Park Corporation (PSPC), should prioritise institutional access, community

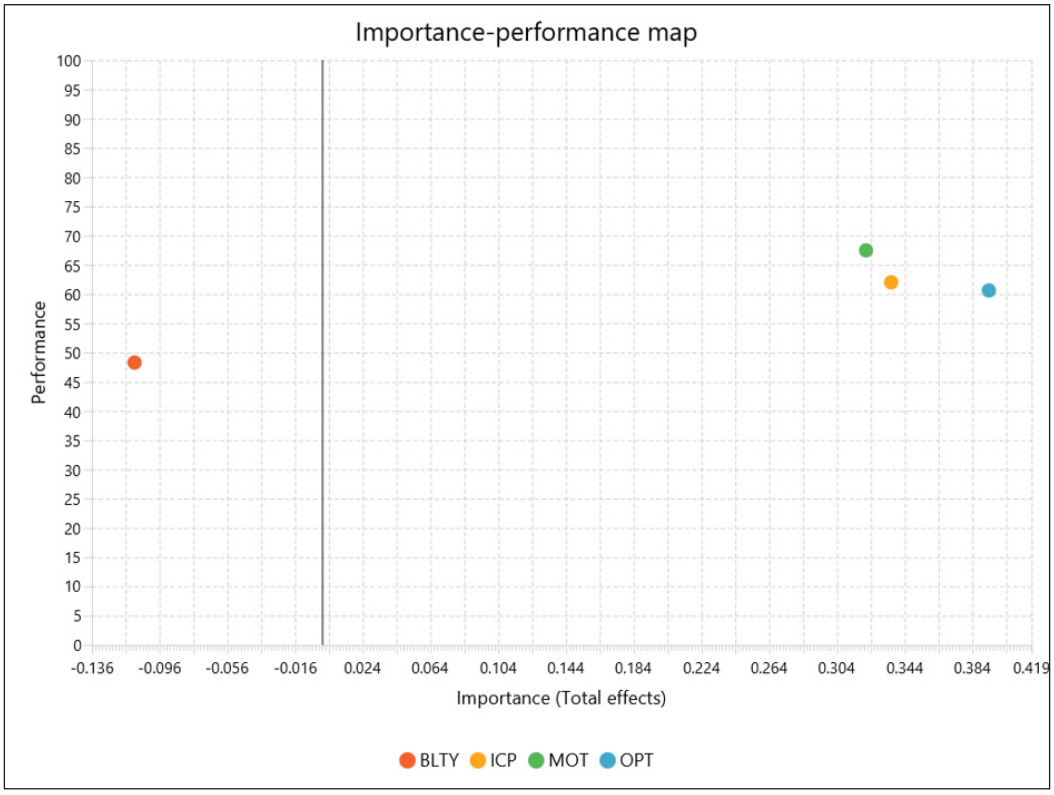

Figure 5. Importance-Performance Map for Sustainable Ecotourism Development (SmartPLS 4 output, 2026)

voice, and participatory planning rather than relying mainly on motivational campaigns.

RESULTS AND DISCUSSION

The findings are not so much confirmatory but more of a refinement of the MOA model. The model has two basic components: participation requires motivation and participation requires opportunity and ability as Hung et al. (2011) applied this model in tourism participation. However, the results of the current study indicate that the three MOA antecedents are not equally potent in indigenous ecotourism. Although indigenous community participation was not directly affected by motivation, motivation would be a contributing factor to the improvement of sustainable ecotourism development. Nonetheless, this leads to the question of whether it is just a simple attitudinal perspective of MOA because a positive attitude does not necessarily lead to participation as might be the case with the Jahai tribe. The result aligns with the findings of Dong et al. (2024) who delineated that opportunity and ability significantly affected farmers' willingness to participate in agricultural heritage tourism whereas motivation did not. It also supports the findings by Kadir and Ni (2024) that participation impacts were not sustained in rural tourism development due to insufficient motivation levels.

A deeper theoretical introspection is needed to understand this paradox. The result for the non-significant correlation between motivation and participation (H1) can be understood by the concept of structural tokenism. If institutional governance is a hurdle in highly marginalised populations, even the most willing community members to participate in sustainable ecotourism will be powerless in practice because they may be involved in consultation but not in the real decision-making process. A highly motivated community faces impenetrable legal and bureaucratic exclusion, and the behaviour of active participation is ultimately disassociated, creating cognitive dissonance. A highly motivated community experiences a clogged pathway of legal and bureaucratic exclusion, and the behaviour of active participation becomes disassociated, creating cognitive dissonance (Khumalo, 2026).

In an international context, similar mechanisms can be seen worldwide. Studies of the Colombian Wiwa Indigenous Tourism structures have shown how community empowerment and cultural revitalisation are highly dependent on the possibility of guiding co-management processes with minimal interference from the state (Giandomenico, 2025). In turn, a detailed analysis of institutional opportunities in local economic development strategies in the Vhembe District of South Africa has determined that institutional opportunity created by decentralised local governments is the fundamental predictor in elevating local tourism beyond subsistence levels (Ramukumba, 2024).

Ability was also a significant predictor of indigenous community participation further highlighting the continued importance of capacity. The Jahai tribe has strong ecological and cultural knowledge gained from living in RBSP. However, there are other skills and capacities needed for formal ecotourism such as guiding, hospitality, safety, marketing, financial management, and product development. This interpretation is corroborated by recent indigenous tourism activities. Hamid et al. (2025) suggested that community resources are essential to sustainable indigenous tourism while Kadir and Ni (2024) postulated that the role of ability is one of the mechanisms for rural participation in tourism. Nevertheless, ability had no direct and only indirect marginal impact on sustainable ecotourism development. This can result in unused skills if the Jahai community members do not have accessibility.

Moreover, the negative and non-significant, direct link between ability and sustainable ecotourism development (H6) is the introduction of the phenomenon of "capacity drain." Indigenous people may also gain a greater awareness of systemic inequities while learning modern hospitality and financial management skills. Without a strong participatory structure (mediator), the very competent Jahai community members are more likely to migrate to urban tourism sites in search of remuneration that commensurate with their skills. If training is provided without further strengthening the capacity of Jahai as stewards of the park, it can inadvertently "undermine" the park's indigenous stewards who are most

likely to be trained in sustainable practices (Giandomenico, 2025).

The marked impact of indigenous community involvement on sustainable development of ecotourism validates that participation is not ornamental. It is a vital aspect of sustainability. Gidebo (2023) proposed the idea of community-based tourism to link livelihoods and biodiversity conservation in tourism protected areas while Prayitno et al. (2024) suggested that trust, networks and community norms can enhance sustainable tourism development. Yanying et al. (2026) also emphasised that empowering the community and aligning tourism with cultural heritage preservation are essential for ensuring sustainable tourism. The results indicate that community willingness is not as important as institutional opportunity, usable ability, and substantive participation for sustainable ecotourism in RBSP.

Ability also significantly predicted indigenous community participation, confirming that capacity remains indispensable. The Jahai community possesses deep ecological and cultural knowledge through long residence in RBSP, but formal ecotourism requires additional competencies in guiding, hospitality, safety, marketing, financial management and product development. Recent indigenous tourism studies support this viewpoint. Hamid et al. (2025) opined that community resources are crucial for sustainable indigenous tourism, while Kadir and Ni (2024) emphasised ability as a key mechanism in rural tourism participation. However, ability did not directly influence sustainable ecotourism development, and its indirect effect was marginal. This means that skills without access risk are becoming unused.

Policy and Theoretical Implications

The findings support a Royal Belum State Park Sustainable Ecotourism Development (OAP-SED) Framework. A conscious hierarchy of action needs to be implemented in the implementation of this framework which is directly influenced by the combined Importance-Performance Map Analysis (IPMA). The data in IPMA methodology incorporates both sufficiency and necessity logics, which implies that the necessary structural opportunity is the first and most important "must-have" condition for everything that ensues (Hauff et al., 2024). The participation of the Jahai tribe should not be merely tokenistic but a key part of the governance process to empower them structurally (Kim et al., 2021; Yanying et al., 2026). This involves establishing village consultation councils, channels for submitting proposals, paid planning seats, guiding and enterprise training as well as community-led monitoring systems (Dong et al., 2024; Kadir & Ni, 2024;).

Priority 1: Policymakers should implement transfer of control to local Destination Management Organisations similar to other countries where co-management has been effective and legally protect indigenous land rights and intellectual property over traditional ecological knowledge (TEK). While there

are awareness and motivational campaigns for ecotourism, the Malaysian National Ecotourism Plan already has the intention to associate ecotourism with community welfare and environmental protection as shown in the current study. This resonates with findings that community-based tourism can contribute to conservation when community members are a part of decision making and benefits are shared (Gidebo, 2023; Yanying et al., 2026).

Priority 2: Localised Ability and Financial Literacy. Structural channels need to be solidified after which agencies need to address severely constrained Ability baselines (M=2.93.). Capacity building needs to go beyond general hospitality training to more advanced technical skills. Localised programmes need to provide strong training on micro-financing, digital marketing platforms and the monitoring software for an ecosystem because of the direct linkages between financial literacy and enterprise survival in indigenous SMEs. Given the direct correlations between financial literacy and enterprise survival in indigenous SMEs, localised programmes must deliver rigorous guidance in micro-financing, digital marketing platforms and ecosystem monitoring software (Molosiwa & Holland, 2025; Sharma et al., 2025).

Priority 3: Substantive Participation and Revenue Sharing. The culmination of the OAP-SED mechanism relies on transforming opportunity and ability into direct economic action. To mimic the robust Public-Private-Community Partnerships (PPCPs) observed in successful transitional ecotourism models, RBSP must mandate that private eco-resort operators engage in legally binding profit-sharing consortiums with the Jahai community (Wong & Thirumoorthi, 2026).

The conclusions drawn in this study lay the foundation for a model which is much broader than the boundaries of RBSP. When these findings were synthesised with global data, it has been observed that the need for institutional opportunity is a universal condition logic for sustainable community development from raw ecotourism potential across different biomes. The need for Public-Private-Community Partnerships (PPCPs) as spelt out in the recommendations is closely linked to the models for transitional governance that have been observed in other countries. There is a direct link between the formalised representation of community at the decision-making table and the sustainability of the enterprise when assessing the operational success of cultural tourism in rural and remote areas (Bašan, et al., 2025). Ecotourism often becomes a very extractive industry with the host community taking ecological risks and the external actors taking the financial risks when governance models do not accede to the devolution of power.

Succinctly, the OAP-SED Framework is an important corrective model. It clearly removes the onus of indigenous people "not having the motivation" to participate in the decision-making process and squarely puts the burden of the institutions that govern over indigenous people to create clear and equitable leadership opportunities.

Incorporating necessity logic into these assessments will help alleviate the false assumption that training or awareness can replace real economic and political empowerment (Hauff et al., 2024).

Properly implemented, as depicted in Figure 6, the OAP-SED Framework can potentially advance SDG 8 (Decent Work and Economic Growth) through decent livelihood opportunities, SDG 11 (Sustainable Cities and Communities) through cultural and community resilience, and SDG 15 (Life on Land) through biodiversity conservation (Kadir & Ni, 2024; Ramaano, 2026; Sachs et al., 2025).

Figure 6 presents the OAP-SED framework for translating Jahai community members' participation into sustainable ecotourism development in Malaysia. It shows policy making authorities create opportunities and strengthen ability through consultation councils, proposal channels, paid planning seats, training and capacity support. These inputs are channelled into indigenous community participation which then supports livelihood opportunities, cultural resilience and biodiversity conservation aligned with SDG 8, SDG 11 and SDG 15 (Ramaano, 2026; Sachs et al., 2025).

The mediation findings provided theoretical implications on how the MOA model operates in an indigenous ecotourism setting. Motivation may shape favourable perceptions of sustainable ecotourism, but it does not by itself create participatory agencies. Therefore, opportunity is theoretically decisive because it confirms Hung et al.'s (2011) argument that participation requires not only willingness

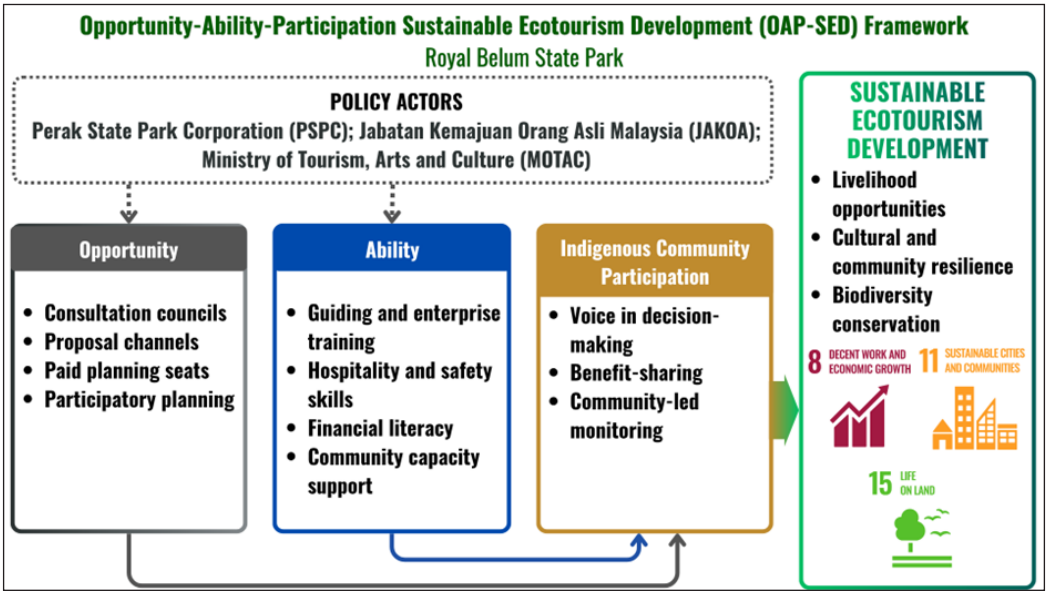

Figure 6. Opportunity-Ability-Participation Sustainable Ecotourism Development (Authors' Computation, 2026)

but enabling conditions. Its indirect-only effect also aligns with recent tourism studies showing that antecedents often become significant through participation mechanisms rather than direct effects alone (Dong et al., 2024; Kadir & Ni, 2024; Xu et al., 2022). Ability's marginal mediation further suggested that capacity-building is necessary but insufficient without institutional access. The results can be best analysed by combining Hung et al. (2011)'s MOA model and Tosun (2006)'s community participation theory. MOA adds value on how the Jahai community members can participate through motivation, opportunity and ability while Tosun's theory adds value on what type of participation it is. Ensuring participation that is only induced as consultative or outside of management is unlikely to lead to sustainable outcomes. Therefore, the substantial mediation of opportunity by indigenous community participation indicates that opportunity needs to go beyond accessibility to influence.

CONCLUSION

This study analysed the relationship of indigenous community participation in sustainable ecotourism development within Royal Belum State Park under the influence of three factors: motivation, opportunity and ability based on a total of 113 Jahai respondents. The study reveals that opportunity and ability are significant factors to explain indigenous community participation whereas motivation is not by using PLS-SEM, mediation analysis, disjoint two-stage approach, CVPAT and IPMA. Nonetheless, favourable perceptions of ecotourism are not necessarily translated into participatory action as they directly influence sustainable ecotourism development. The indigenous community plays a pivotal role in governance and is an important mechanism to enhance sustainable ecotourism development. The most significant contribution of the study is seen in the mediation results. The Opportunity factor has direct mediated relevance to influence the sustainable development of ecotourism that involve indigenous community participation, and ability has a marginal mediated relevance to influence the sustainable development of ecotourism that involve indigenous community participation. Theoretically, the findings improve the MOA model, demonstrating that in indigenous ecotourism, motivation, opportunity and ability are not interchangeable motivators. They also help to reinforce Tosun's theory of community participation that should go beyond consultation to influence, access and benefit-sharing in the planning stage. Evidently, in practical terms, the evidence is direct: RBSP needs an OAP-SED framework. The Jahai community members' opportunity and ability influence sustainable ecotourism participation, but sustainable ecotourism development is vital in ascertaining the Jahai tribe's livelihoods, cultural resilience and biodiversity conservation.

LIMITATION AND FUTURE RESEARCH

This study has limitations that should be taken as opportunities for further research rather than weaknesses in the design.

Firstly, the cross-sectional survey design does not allow for an understanding of how Jahai tribe's perceptions of motivation, opportunity, ability and participation change at different points in time as ecotourism governance develops. Longitudinal designs should be used in future studies to determine whether institutional opportunity results in sustained involvement or brief consultation. Secondly, the study is limited to two Jahai settlements in the Royal Belum State Park, providing greater in-depth understanding of the context but also limiting the extent of generalisation to other groups of Orang Asli or protected tourism areas in general. Comparative works within indigenous communities would fine tune the cultural and institutional lines of the OAP-SED framework. Thirdly, the use of self-reported data may be under-reporting political tensions in relation to participation. Future research should thus be a mixture of PLS-SEM and interviews, observation and policy document analysis to render the process of participation in practice. Lastly, future research may examine moderating variables such as trust, quality of governance, and security of land rights.

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REFERENCES

Arnstein, S. R. (1969). A ladder of citizen participation. *Journal of the American Institute of Planners, 35*(4), 216-224. https://doi.org/10.1080/01944366908977225

Bahamonde-Rodríguez, M., Šadeikaitė, G., & García-Delgado, F. J. (2023). The effects of tourism on local development in protected nature areas: The case of three nature parks of the Sierra Morena (Andalusia, Spain). *Land, 12*(4), Article 898. https://doi.org/10.3390/land12040898

Bašan, L., Butković, I., & Črnjar, K. (2025). Empowering Gen Z for Engaging in Sustainable Tourism: A ZRETP Model Approach. *Sustainability*, *17*(18), Article 8366. https://doi.org/10.3390/su17188366

Batra, R., & Ray, M. L. (1986). Situational effects of advertising repetition: The moderating influence of motivation, ability, and opportunity to respond. *Journal of Consumer Research, 12*(4), 432-445. https://doi.org/10.1086/208528

D'Arco, M., Lo Presti, L., Marino, V., & Maggiore, G. (2021). Is sustainable tourism a goal that came true? The Italian experience of the Cilento and Vallo di Diano National Park. *Land Use Policy, 101*, Article 105198. https://doi.org/10.1016/j.landusepol.2020.105198

Dong, F., Zhang, Y., & Wang, Z. (2024). Activation and inheritance: Farmers' willingness to participate in agricultural heritage tourism development: A case study on the Nanguo Pear Cultivation System in Anshan, China. *Sustainability, 16*(23), Article 10500. https://doi.org/10.3390/su162310500

Echeverri, A., Batista, N. M., Wolny, S., Herrera-R, G. A., Andrade-Rivas, F., Bailey, A., ... & Ocampo-Peñuela, N. (2025). Toward sustainable biocultural ecotourism: An integrated spatial analysis of cultural and biodiversity richness in Colombia. *People and Nature*, *7*(1), 194-214. https://doi.org/10.1002/pan3.10755

Fan, P., Ren, L., & Zeng, X. (2024). Resident participation in environmental governance

of sustainable tourism in rural destination. *Sustainability, 16*(18), Article 8173. https://doi.org/10.3390/su16188173

Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods, 41*(4), 1149-1160. https://doi.org/10.3758/BRM.41.4.1149

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research, 18*(1), 39-50. https://doi.org/10.1177/002224378101800104

Giandomenico, A. (2025). Tourism, sustainability and local agency: a comparative study of community-based tourism models across three case studies in the Global South.

Gidebo, H. B. (2023). Linking livelihood and biodiversity conservation in protected areas: Community-based tourism development perspective from developing country. *Tourism and Hospitality Research, 23*(3), 361-375. https://doi.org/10.1177/14673584221102699

Gomes, S., & Lopes, J. M. (2023). Insights for pro-sustainable tourist behavior: The role of sustainable destination information and pro-sustainable tourist habits. *Sustainability, 15*(11), Article 8856. https://doi.org/10.3390/su15118856

Gwee, S. L., Tan, A. K. G., & Narayanan, S. (2019). Sustainable tourism and forest conservation: The case of the Belum-Temengor Rainforest Complex in Perak, Malaysia. *Journal of Sustainable Forestry, 38*(4), 327-342. https://doi.org/10.1080/10549811.2018.1549498

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2022). *A primer on partial least squares structural equation modeling (PLS-SEM)* (3rd ed.). SAGE.

Hamid, A. Z., Kunasekaran, P., & Alam, M. (2025). The role of social capital and social media in tourism development towards the wellbeing of the Mah Meri community in Carey Island, Malaysia. *Pertanika Journal of Social Sciences & Humanities, 33*(S1). https://doi.org/10.47836/pjssh.33.S1.07

Hauff, S., Richter, N. F., Sarstedt, M., & Ringle, C. M. (2024). Importance and performance in PLS-SEM and NCA: Introducing the combined importance-performance map analysis (cIPMA). *Journal of Retailing and Consumer Services, 78*, Article 103723. https://doi.org/10.1016/j.jretconser.2024.103723

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science, 43*, 115-135. https://doi.org/10.1007/s11747-014-0403-8

Hung, K., Sirakaya-Turk, E., & Ingram, L. J. (2011). Testing the efficacy of an integrative model for community participation. *Journal of Travel Research, 50*(3), 276-288. https://doi.org/10.1177/0047287510362781

Ivasciuc, I.-S., & Ispas, A. (2023). Exploring the motivations, abilities and opportunities of young entrepreneurs to engage in sustainable tourism business in the mountain area. *Sustainability, 15*(3), Article 1956. https://doi.org/10.3390/su15031956

Jameel, A., Hussain, A., Kanwel, S., & Guo, W. (2025). Advancing sustainable rural tourism in China: The role of system development and community support through a moderated mediation model. *Humanities and Social Sciences Communications, 12*(1), 1-16.

Jiao, Y., & Wang, Y. (2025). The formation of tourists' pro-environmental behavior in natural history museum scene: A configuration analysis based on motivation–opportunity–ability theory. *Journal of Vacation Marketing, 31*(4), 886-903. https://doi.org/10.1177/13567667241247073

Jordan, P. J., & Troth, A. C. (2020). Common method bias in applied settings: The dilemma of researching in organizations. *Australian Journal of Management, 45*(1), 3-14. https://doi.org/10.1177/0312896219871976

Kadir, I. A., & Ni, C. L. (2024). Stimulating SDGs in rural tourism development: The mediation effect of motivation, opportunity and ability in the relationship of perception for tourism development and community participation. *Planning Malaysia, 22*(5), 38-51. https://doi.org/10.21837/pm.v22i34.1572

Kamal, S. F. (2020). Rationalising the role of Orang Asli in co-management of the Royal Belum State Park, Malaysia. *Journal of Tropical Forest Science, 32*(4), 361-368. https://doi.org/10.26525/jtfs2020.32.4.361

Khumalo, P., Sambo, V., Lekonyane, B., Nokele, K. S., & Raseala, P. (2026). Rethinking local economic development support: Prospects for Rand West City Local Municipality. *Frontiers in Sustainable Resource Management, 5*, Article 1525555.

Kim, S., Kang, Y., Park, J.-H., & Kang, S.-E. (2021). The impact of residents' participation on their support for tourism development at a community level destination. *Sustainability, 13*(9), Article 4789. https://doi.org/10.3390/su13094789

Kock, N. (2015). Common method bias in PLS-SEM: A full collinearity assessment approach. *International Journal of e-Collaboration, 11*(4), 1-10. https://doi.org/10.4018/IJEC.2015100101

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement, 30*(3), 607-610. https://doi.org/10.1177/001316447003000308

Kunasekaran, P., Rasoolimanesh, S. M., Wang, M., Ragavan, N. A., & Hamid, Z. A. (2022). Enhancing local community participation towards heritage tourism in Taiping, Malaysia: Application of the Motivation-Opportunity-Ability (MOA) model. *Journal of Heritage Tourism, 17*(4), 465-484. https://doi.org/10.1080/1743873X.2022.2048839

Liengaard, B. D., Sharma, P. N., Hult, G. T. M., Jensen, M. B., Sarstedt, M., Hair, J. F., & Ringle, C. M. (2021). Prediction: Coveted, yet forsaken? Introducing a cross-validated predictive ability test in partial least squares path modeling. *Decision Sciences, 52*(2), 362-392. https://doi.org/10.1111/deci.12445

MacInnis, D. J., Moorman, C., & Jaworski, B. J. (1991). Enhancing and measuring consumers' motivation, opportunity, and ability to process brand information from ads. *Journal of Marketing, 55*(4), 32-53. https://doi.org/10.1177/002224299105500405

Molosiwa, T., & Holland, J. (2025). The impact of financial literacy on the performance of small and medium-sized enterprises (SMEs): A review of literature. *International Journal of Research in Business and Social Science, 14*(3), 320-332.

Nilsson Vestola, J., & Ek Styvén, M. (2025). Drivers and inhibitors of Gen Z's proenvironmental travel engagement: Exploring MOA factors and goal frames. *Young Consumers, 26*(7), 55-73. https://doi.org/10.1108/YC-06-2024-2096

Ölander, F., & Thøgersen, J. (1995). Understanding of consumer behaviour as a prerequisite for environmental protection. *Journal of Consumer Policy, 18*(4), 345-385. https://doi.org/10.1007/BF01024160

Oleśniewicz, P., Pytel, S., Markiewicz-Patkowska, J., Szromek, A. R., & Jandová, S. (2020). A model of the sustainable management of the natural environment in national parks: A case study of national parks in Poland. *Sustainability, 12*(7), Article 2704. https://doi.org/10.3390/su12072704

Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how

to control it. *Annual Review of Psychology, 63*, 539-569. https://doi.org/10.1146/annurev-psych-120710-100452

Prayitno, G., Auliah, A., Ari, I. R. D., Effendi, A., Hayat, A., Delisa, A., Siankwilimba, E., & Hiddlestone-Mumford, J. (2024). Social capital for sustainable tourism development in Indonesia. *Cogent Social Sciences, 10*(1), Article 2293310. https://doi.org/10.1080/23311886.2023.2293310

Ramaano, A. I. (2026). Rural pursuits and local climate change influence on subsistence: A sustainable tourism approach to provincial environmental governance and sustainability targets. *Management of Environmental Quality: An International Journal, 37*(1), 208-233. https://doi.org/10.1108/MEQ-07-2024-0303

Ramli, R. R., & Kamal, N. A. (2026). Overview on the characteristics of houseboats in the Royal Belum State Park, Perak, Malaysia. *Journal of Asian Architecture and Building Engineering, 25*(1), 141-156. https://doi.org/10.1080/13467581.2025.2454630

Ramukumba, T. (2024). Rural tourism in South Africa: A local economic development strategy. *Interdisciplinary Journal of Rural and Community Studies, 6*, 1-16. https://doi.org/10.38140/ijrcs-2024.vol6.03

Rasoolimanesh, S. M., & Jaafar, M. (2016). Residents' perception toward tourism development: A pre-development perspective. *Journal of Place Management and Development, 9*(1), 91-104. https://doi.org/10.1108/JPMD-10-2015-0045

Rasoolimanesh, S. M., Jaafar, M., Ahmad, A. G., & Barghi, R. (2017). Community participation in World Heritage Site conservation and tourism development. *Tourism Management, 58*, 142-153. https://doi.org/10.1016/j.tourman.2016.10.016

Ringle, C. M., & Sarstedt, M. (2016). Gain more insight from your PLS-SEM results: The importance-performance map analysis. *Industrial Management & Data Systems, 116*(9), 1865-1886. https://doi.org/10.1108/IMDS-10-2015-0449

Sachs, J. D., Lafortune, G., Fuller, G., & Iablonovski, G. (2025). *Sustainable development report 2025: Financing sustainable development to 2030 and mid-century*. Dublin University Press. https://doi.org/10.25546/111909

Sarstedt, M., Hair, J. F., Cheah, J.-H., Becker, J.-M., & Ringle, C. M. (2019). How to specify, estimate, and validate higher-order constructs in PLS-SEM. *Australasian Marketing Journal, 27*(3), 197-211. https://doi.org/10.1016/j.ausmj.2019.05.003

Sarstedt, M., Richter, N. F., Hauff, S., & Ringle, C. M. (2024). Combined importance–performance map analysis (cIPMA) in partial least squares structural equation modeling (PLS–SEM): A SmartPLS 4 tutorial. *Journal of Marketing Analytics, 12*(4), 746-760.

Sarstedt, M., Ringle, C. M., & Hair, J. F. (2021). Partial least squares structural equation modeling. In C. Homburg, M. Klarmann, & A. E. Vomberg (Eds.), *Handbook of market research* (pp. 587-632). Springer. https://doi.org/10.1007/978-3-319-57413-4_15

Saunders, M. N. K., Lewis, P., & Thornhill, A. (2023). *Research methods for business students* (9th ed.). Pearson.

Scheyvens, R. (1999). Ecotourism and the empowerment of local communities. *Tourism Management*, *20*(2), 245-249. https://doi.org/10.1016/S0261-5177(98)00069-7

Scheyvens, R., & van der Watt, H. (2021). Tourism, empowerment and sustainable development: A new framework for analysis. *Sustainability, 13*(22), Article 12606.

Schwabe, K. A., Carson, R. T., DeShazo, J. R., Potts, M. D., Reese, A. N., & Vincent, J. R. (2015). Creation of Malaysia's Royal Belum

State Park: A case study of conservation in a developing country. *The Journal of Environment & Development, 24*(1), 54-81. https://doi.org/10.1177/1070496514551173

Sharma, S., et al. (2025). Digital marketing adoption by small travel agencies. *European Journal of Innovation Management, 28*(2), 560-590. https://doi.org/10.1108/EJIM-09-2022-0532

Shmueli, G., Sarstedt, M., Hair, J. F., Cheah, J.-H., Ting, H., Vaithilingam, S., & Ringle, C. M. (2019). Predictive model assessment in PLS-SEM: Guidelines for using PLSpredict. *European Journal of Marketing, 53*(11), 2322-2347. https://doi.org/10.1108/EJM-02-2019-0189

Situmorang, T. P., Bengkel, Triyono, Ritonga, A. D., & Batubara, P. E. O. (2026). The impact of sustainable indigenous tourism on indigenous rights and community well-being moderated by empowering communities in Lake Toba, Indonesia. *Frontiers in Human Dynamics, 8*, Article 1811417.

Tang, H., Ma, Y., & Ren, J. (2022). Influencing factors and mechanism of tourists' pro-environmental behavior: Empirical analysis of the CAC-MOA integration model. *Frontiers in Psychology, 13*, Article 1060404. https://doi.org/10.3389/fpsyg.2022.1060404

Teo, W., Siow, M. L., Ibrahim, M. R., Kunasekaran, P., & Shuib, A. (2025). Tourism leadership behaviour at times of crisis: A Malaysian's perspective during the COVID-19 pandemic and the way forward for sustainable policies. *Worldwide Hospitality and Tourism Themes, 17*(3), 393-404. https://doi.org/10.1108/WHATT-02-2025-0064

Tosun, C. (1999). Towards a typology of community participation in the tourism development process. *Anatolia, 10*(2), 113-134. https://doi.org/10.1080/13032917.1999.9686975

Tosun, C. (2006). Expected nature of community participation in tourism development. *Tourism Management, 27*(3), 493-504. https://doi.org/10.1016/j.tourman.2004.12.004

Wong, B. K. M., & Thirumoorthi, T. (2026). A note on community-based leisure approach to cultural preservation in Sarawak Cultural Village. *Journal of Sustainable Tourism, 34*(2), 258-271. https://doi.org/10.1080/16078055.2025.2549478

Xu, S., Zuo, Y., Law, R., & Zhang, M. (2022). Impact of farmers' participation in tourism on sustainable livelihood outcomes in border tourism areas. *International Sociology, 37*(1), 50-77. https://doi.org/10.1177/02685809211024019

Yanying, L., Konar, R., Subramaniam, T., Fuchs, K., Kunasekaran, P., & Neethiahnanthan Ari Ragavan, N. (2026). Community resident and sustainable cultural heritage tourism development: A systematic literature review using PRISMA. *Tourism: An International Interdisciplinary Journal*, *74*(1), 95-112. https://doi.org/10.37741/t.74.1.6

Yoon, Y., Gursoy, D., & Chen, J. S. (2001). Validating a tourism development theory with structural equation modeling. *Tourism Management, 22*(4), 363-372. https://doi.org/10.1016/S0261-5177(00)00062-5

Zhang, X., Dolah, J., & Cao, Z. (2025). Sustainable nature tourism and forest conservation strategies based on forest wellness tourism demand: A case study of Royal Belum State Park, Malaysia. *Forests, 16*(2), Article 270. https://doi.org/10.3390/f16020270

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Anxiety in Malaysian Adults: Psychometric Validation of the Screen for Adult Anxiety Related Disorders (SCAARED)

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ABSTRACT

The prevalence of anxiety disorders among Malaysian adults is high and yet, locally validated self-report measures that comprehensively assess specific anxiety domains remain limited. The Screen for Adult Anxiety Related Disorders (SCAARED) measures Panic/Agoraphobia, Generalised Anxiety, Social Anxiety, and Separation Anxiety, but has not been validated in Malaysia. This study examined the psychometric properties of the SCAARED using non-probability sampling methods. A predominantly non-clinical sample of 1,058 English-speaking Malaysians aged 18-68 years was recruited. Participants completed SCAARED and selected items from five DSM-5 dimensional anxiety scales. Confirmatory factor analysis supported the original four-factor structure, indicating excellent model fit (χ^2 = 1,080.231, *df* = 896, CFI = .963, TLI = .961, RMSEA = .014, SRMR = .037). The total-scale demonstrated high internal consistency (α = .827, ω = .837). Reliability was acceptable for Panic/Agoraphobia (α = .749, ω = .765) subscale but not for the remaining subscales. Convergent validity was supported by statistically significant correlations of strong effect sizes for Panic (*r* = .557) and Agoraphobia (*r* = .558) subscales. These findings offer preliminary support for the SCAARED among English-speaking Malaysian adults. The lack of clinical samples and lower reliability of some subscales suggests a need for further adaptation and refinement in future studies.

Keywords: Anxiety disorders, Malaysian adults, reliability, SCAARED, validity

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INTRODUCTION

Background

Anxiety disorders (ADs) are among the most prevalent mental health conditions worldwide (Khaiyom et al., 2021). In Malaysia, ADs remain a significant public health concern with a prevalence of generalised anxiety disorder (GAD) at 1.7%,

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comparable to global estimates (Ministry of Health Malaysia, 2020). However, other ADs including panic disorder, agoraphobia, social anxiety disorder (SAD), and separation anxiety disorder (SEP) are less frequently recognised and may be underdetected among Malaysian adults (Khaiyom et al., 2019).

In Malaysia, anxiety assessment in clinical settings commonly rely on self-reports (Balsamo et al., 2018) such as the Beck Anxiety Inventory (BAI), Depression Anxiety Stress Scale-21 (DASS-21), and Generalised Anxiety Disorder-7 (GAD-7). Although these tools primarily assess overall anxiety severity (Ismail et al., 2023; Oei et al., 2013; Shawaluddin et al., 2023), they do not adequately differentiate between specific AD domains. This limits their utility for diagnostic clarification, research comparison, and targeted intervention.

The Screen for Adult Anxiety Related Disorders (SCAARED) developed by Angulo et al. (2017) addresses this limitation. SCAARED is a 44-item self-report instrument grounded in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) (American Psychiatric Association, 2013a). It was adapted from the Screen for Child Anxiety Related Emotional Disorders (SCARED) by Birmaher et al. (1997).

In Malaysia, the English version of the SCARED has been validated by Ang (2020) for Malaysian children and adolescences. However, the absence of a validated adult counterpart to SCARED in Malaysia limits continuity in anxiety assessment across developmental stages. Clinicians and researchers will need to transition to different instruments once individuals reach adulthood, complicating longitudinal comparison of anxiety trajectories and potentially obscuring developmental patterns (Angulo et al., 2017).

Moreover, SEP was only recently recognised for adults (Silove et al., 2015) in the DSM-5 (American Psychiatric Association, 2013a), and many adult anxiety instruments were developed prior to this revision. Consequently, no validated adult instrument in Malaysia comprehensively assesses DSM-5 anxiety domains, including SEP. In the absence of such tools, adult anxiety assessments in Malaysia could be at risk of reduced diagnostic accuracy.

Local validation is also important as several psychological tools originally based on western adult measures, have been put to use in Malaysia without proper validation (Abubakar & Fischer, 2011; Khaiyom et al., 2019). This may cause misidentification of anxiety profiles because instruments may not align with local manifestation of symptoms. For example, Ang (2020) found that the original five-factor model of SCARED required modification in Malaysian samples, resulting in a four-factor structure. These findings indicate that the organisation of anxiety symptoms can differ in Malaysia and raises questions about whether SCAARED will show a similar pattern among Malaysian adults. It is also uncertain whether SCAARED fully reflects DSM-5 anxiety constructs within a multicultural collectivist context, making local validation necessary.

Overall, these issues emphasise the need for a validated adult version of SCAARED that can be used for accurate assessment of ADs in Malaysia. Anxiety measurement instruments that do not take into account the latest diagnostic criteria or are not suitably adapted for a certain population may pose a risk of overlooking or misclassifying symptoms (Niwenahisemo et al., 2025). A SCAARED validation in Malaysia can be the first step towards addressing the absence of an adult anxiety measure that aligns with DSM-5 domains, reflects local symptom expressions, and is consistent with the SCARED. Establishing its psychometric quality may improve assessment accuracy, clinical decision-making, and research on anxiety across the lifespan in Malaysia.

Research Objectives

The present study aims to examine the construct validity of the original four-factor structure of SCAARED, assess the internal consistency of the total scale and its subscales, and evaluate convergent validity through comparisons between SCAARED subscales and established DSM-5 dimensional anxiety measures assessing the corresponding anxiety domains.

Significance

Cross-cultural perspectives propose that cultural norms influence how anxiety is expressed and interpreted. This study will help assess which anxiety constructs meet the theoretical structure in Malaysia and identify which need culturally informed interpretations. As a result, this reduces inaccurate assumptions on how anxiety manifests among Malaysians and supports the practice of validating assessments before use in a certain population.

No research has previously produced psychometric evidence of SCAARED in the Malaysian population. Evaluating factor structure, internal consistency and convergent validity will provide the first local evidence regarding the instrument's four-factor model in Malaysian adults. This work addresses a methodological gap for future research to refine culturally sensitive item wording.

This study will enable clinical psychologists and psychiatrists to emphasize a culturally appropriate assessment for screening, case formulation, and treatment planning. Universities and training programmes will gain access to an evidence-based measure suitable for research and teaching. Workplaces, employee assistance programmes, and public health initiatives will be able to adopt a reliable screening tool to support early detection and intervention. Governmental agencies and policymakers involved in national mental health strategy will benefit from local data that inform guidelines for standard assessment practice, strengthen monitoring systems across age groups, and shape culturally grounded public mental health policies.

LITERATURE REVIEW

Psychometric Rationale

Cultural relativism by Herskovits (1972) emphasises that psychological phenomena must be understood within their cultural

context recognising the uniqueness of each society. Similarly, Hofstede (2011)'s theory of cultural dimensions addresses the distinction between individualistic and collectivistic societies. As Malaysia as a collectivistic society, where social harmony, group cohesion and relational interdependence are prioritised (Ma'rof et al., 2024), generalisability of the SCAARED cannot be assumed. As the scale was developed in a more individualistic context, local validation is needed to determine if it is appropriate for use within the Malaysian population.

Classical Test Theory (CTT) explains that reliability and item statistics depend on samples completing the scale, supporting that instruments function best in populations where they were originally developed (De Ayala, 2009). Internal consistency is therefore central to this validation as it determines if items within each subscale measure their respective anxiety domain coherently. This will be assessed using indices such as Cronbach's alpha (α) and McDonald's omega (ω) to determine reliability of the SCAARED items.

As anxiety constructs are not directly observable, Latent Variable Theory (LVT) encourages the use of questionnaires where different item responses reflect individual differences in the underlying latent trait (Gunzler et al., 2024). Construct validity is thus important in this study because the SCAARED assumes that its items reflect four different DSM-5 anxiety domains. Cronbach and Meehl (1955) defined construct validity as the extent to which a measure behaves as expected in relation to other well-established instruments (Haig, 2023). This can be examined through confirmatory factor analysis (CFA), where acceptable model fit would show that the proposed factor structure aligns with theoretical constructs. Convergent validity further strengthens this process by examining if the SCAARED correlates meaningfully with other validated anxiety measures (Zhou et al., 2025).

The DSM-5 ADs, including Panic/Agoraphobia, GAD, SAD and SEP (American Psychiatric Association, 2013a), represent the conceptual basis for the SCAARED (Angulo et al., 2017). Each disorder is differentiated by specific cognitive themes, avoidance patterns and physiological features (American Psychiatric Association, 2013a), which form the foundation of SCAARED's four subscales. Therefore, examining the internal consistency, factor structure and convergent validity of the SCAARED will provide preliminary evidence on whether the scale is psychometrically sound in the Malaysian context.

Psychometric Properties Across Cultures

Existing validation studies generally support the SCAARED as a multidimensional measure of adult anxiety, but they also show that item and factor performances can vary across cultures. When developing the SCAARED, Angulo et al. (2017) assessed 336 individuals aged 18-27 for validation. Taken from a sample of psychiatric patients

and healthy controls, results of factor analysis indicated four domains namely somatic/panic/agoraphobia, GAD, SEP and SAD with a Cronbach's alpha (α) of 0.92, 0.94, 0.86 and 0.91 respectively. Similarly, the total-scale reported a Cronbach's α of 0.97, indicating good internal consistency. Principal components analysis identified a clear four-factor structure that aligned with DSM-5 ADs, and this solution explained 57% of the total variance. These results supported the factor structure and diagnostic utility of the scale. With that, other studies translated and validated the SCAARED in their respective nations.

In Spain (Cueva et al., 2021), Iran (Farani et al., 2022), Korea (Hwang et al., 2024) and China (Wang et al., 2022), the four-factor of SCAARED were generally supported. However, item-level refinements and cross-loadings were noted because an improved fit was seen after model modifications. For example, five items (9, 11, 16, 22 and 25) were removed in the Chinese validation due to low factor loadings and cross-loadings, resulting in a 38-item version. Likewise, the original four-factor model did not show acceptable CFA fit in the Korean validation and a revised four-factor structure was kept with similar dimensions, but several items cross loaded. These findings suggest that some items on the SCAARED may not represent each domain with the same clarity in every population.

Apart from that, Ang (2020) validated SCARED in a community sample of 386 Malaysians aged 8-17 from Kuala Lumpur. Although subscale Cronbach's α ranged from 0.45 to 0.80, neither the original five-factor model nor the revised four-factor model demonstrated acceptable CFA fit. Ang (2020) noted that 'School Avoidance' has consistently emerged as the least reliable factor in international research, including those conducted in Asia. Although the study focused on children, these findings are relevant because SCAARED was derived from SCARED.

Overall, these findings reinforce the rationale for validating SCAARED among Malaysian adults to determine whether the factor structure remains stable and whether cultural influences shape anxiety symptom patterns across development. Furthermore, standardising the language across child and adult versions will allow clearer comparisons. Thus, the SCAARED will not be translated in this preliminary study.

Literature Gap

Across these cultural contexts, SCAARED consistently demonstrated high reliability and strong convergent validity, yet factor structures showed patterns of instability, particularly in relation to somatic and interpersonal items. Most validation studies have reported item-level refinements or structural adjustments in some cultural contexts (Cueva et al., 2021; Hwang et al., 2024; Wang et al., 2022).

Moreover, studies in Korea and Spain had small sample sizes, which reduced generalisability of their findings (Kang & Kim, 2024). Some studies had lengthy

additional instruments besides SCAARED, which led to increased participant fatigue and response bias (Jeong et al., 2022). Ali et al. (2021) also mentioned that cultural adaptation of non-Western measures helps facilitate correct diagnoses. This was reflected in a study by Ang (2020) where the author confirmed validity of SCARED but refactored structures for local population. Taking these discrepancies into account, the current research considered sample sizes, length of extra assessments, and culture-based appropriateness. These inconsistencies provide a strong rationale for validating SCAARED in Malaysian adults to determine whether the four-factor structure holds and whether cultural differences shape item performance.

Research Hypotheses

1. The original four-factor structure of SCAARED will demonstrate acceptable model fit in the Malaysian context, as assessed by CFA fit indices.
2. Acceptable internal consistency in the Malaysian adult population will be seen in;
   2.1. Total-scale.
   2.2. Panic/Agoraphobia.
   2.3. GAD subscale.
   2.4. SAD subscale.
   2.5. SEP subscale.
3. Acceptable convergent validity will be seen with;
   3.1. Panic subscale and Panic Disorder Dimensional Scale (PD-D).
   3.2. Agoraphobia subscale and Agoraphobia Dimensional Scale (AG-D).
   3.3. GAD subscale and Generalised Anxiety Disorder Dimensional Scale (GAD-D).
   3.4. SAD subscale and Social Anxiety Disorder Dimensional Scale (SAD-D).
   3.5. SEP subscale and Separation Anxiety Disorder Dimensional Scale (SEP-D).

METHODOLOGY

Study Design

A cross-sectional survey design was used. This approach is generally recommended in validation studies (So et al., 2026). Cross-sectional datasets are suitable for factor analyses since they offer sufficient data for the first validation and require only one point of data collection (Boateng et al., 2018).

Participants

This study only included Malaysian adults aged 18 and above. To maintain consistency with the validated SCARED instrument in Malaysia (Ang, 2020) and to reduce translation bias, English proficiency was required. The study excluded those with psychiatric disorders (schizophrenia or bipolar disorder) to reduce confounding variables (Silva et al., 2024).

Convenience and snowball sampling were the non-probability methods used to

recruit participants. This is sufficient for validation studies where the main goal is to assess measurement properties rather than obtaining population prevalence (Ahmed, 2024). However, the sample should not be considered representative of all Malaysian adults. The findings therefore offer preliminary evidence from English-speaking Malaysian adults who were reachable online.

Sample Size

Sample size determination followed established methodological recommendations for CFA. The participant-to-item ratio of at least 10:1 is a commonly applied ratio (White, 2022). To allow for incomplete or invalid responses, an additional 20% was added (Bujang, 2021). This resulted in a target of 528 participants.

Measures

Demographic Information

The participants completed a demographic questionnaire. This assessed age, sex, and psychiatric history. They were also asked whether they had previously been diagnosed with an AD. Data on participants' race was not collected because ethnicity analyses were beyond the scope of the present study.

Screen for Adult Anxiety Related Disorders (SCAARED)

The SCAARED items are rated on a three-point Likert scale ranging from 0 ("Not true or hardly ever true") to 2 ("Very true or often true"). Symptoms are based on the past three months, with higher scores indicating greater severity of anxiety.

DSM-5 Dimensional Anxiety Measures

To evaluate convergent validity, selected items from the DSM-5 dimensional anxiety scales developed by the American Psychiatric Association were administered. These included PD-D (American Psychiatric Association, 2013d), AG-D (American Psychiatric Association, 2013b), GAD-D (American Psychiatric Association, 2013c), SAD-D (American Psychiatric Association, 2013f), and SEP-D (American Psychiatric Association, 2013e). Each is rated on a five-point Likert scale ranging from 0 ("Never") to 4 ("All of the time"), assessing symptoms over the past seven days, with higher scores indicating greater severity.

To minimise participant fatigue while maintaining data quality, only the three highest factor loadings or item-total correlations items from each construct were retained based on their documented psychometric robustness. This approach is consistent with evidence showing that short-form measures can preserve validity, particularly when the selection of items is done by the strongest ones only (Smith et al., 2000; Ziegler & Kemper, 2014). For example, the two-item version of the Connor-Davidson Resilience Scale was found to have a very high correlation with the full 25-item scale. This proves that the chosen items can sufficiently represent the constructs (Vaishnavi et al., 2007).

As a result, items 1, 2, and 10 from PD-D, items 2, 3, and 4 from AD-D, items

1, 5, and 8 from GAD-D, items 1, 2, and 5 from SAD-D, and items 2, 5, and 8 from SEP-D were selected accordingly (Coldur et al., 2020; Groves et al., 2023; Lebeau et al., 2012).

Procedure

Before collecting data, approval was obtained by Taylors University Research Ethics Committee (Approval Code: HEC 2025/232). The online Google Forms survey first displayed an information sheet. It described the study's purpose, procedures, potential risks and benefits, and researcher's contact details. Electronic informed consent was obtained prior to participation.

The survey began with demographic questions, followed by the SCAARED and the DSM-5 dimensional anxiety measures accordingly. Participants were informed that completion would take approximately 20-30 minutes. Individuals who did not meet inclusion criteria were automatically directed to the end of the survey. Upon completion, participants viewed a debriefing statement and were provided with a list of Malaysian mental health resources.

Statistical Analysis

Data was analysed using the Statistical Package for the Social Sciences (SPSS) and Jeffreys's Amazing Statistics Program (JASP). According to Rogers (2024), JASP is a suitable and accessible platform that supports typical CFA in social science research, with clear computation. As standard SPSS does not directly support CFA, JASP was used. Missing values, outliers and low-quality response patterns were screened for in the dataset. All incomplete or low-quality responses were removed prior to analysis. Descriptive statistics were computed to summarise demographic characteristics.

One of the most commonly used methods to examine construct validity is CFA (Atkinson et al., 2011), and it is utilised to confirm the factor model of a scale (Gomez et al., 2020). Given the ordinal nature of item responses, CFA was conducted using the weighted least squares mean- and variance-adjusted (WLSMV) estimator (Li, 2016). Model fit was assessed using the Comparative Fit Index (CFI) and Tucker–Lewis Index (TLI), with values $\geq$ 0.90 indicating acceptable fit, the Root Mean Square Error of Approximation (RMSEA) with values $\leq$ 0.08 indicating adequate fit, and the Standardised Root Mean Square Residual (SRMR) with values $\leq$ 0.08 indicating satisfactory fit (Kline, 2016).

Internal consistency of SCAARED's total score and its subscales was evaluated using Cronbach's α (Cronbach, 1951) and McDonald's ω (McDonald, 1999). Reporting Cronbach's α in the present study follows the precedent set by Angulo et al. (2017) in the original SCAARED validation and facilitates cross-study comparison. McDonald's ω was additionally computed because it is recommended when the assumptions underlying Cronbach's α are not met (Goodboy & Martin, 2020), particularly when tau-equivalence is violated (Viladrich et al., 2017). Cronbach's α and McDonald's ω were calculated for the total-scale and its subscales. Coefficients above 0.80 were interpreted as "good" internal consistency,

those above 0.70 were "acceptable", and those below 0.70 were "questionable" (Nunnally, 1978).

Pearson's correlation coefficient was used to examine convergent validity of the SCAARED subscales with the PD-D, AG-D, GAD-D, SAD-D, and SEP-D scales respectively. Effect sizes were based on "small" being ≥ 0.10, "moderate" being ≥ 0.30, and "strong" being ≥ 0.50 (Cohen, 1988). A moderate to strong positive correlation would indicate that SCAARED subscales demonstrate meaningful convergence with DSM-5 dimensional measures, supporting that both assess similar anxiety constructs.

RESULTS

Preliminary Analysis

A total of 1,062 responses were collected. Following data screening, three responses were deleted because their responses did not meet the inclusion criteria. Another was excluded because the participant chose 0 for almost all items except for one panic item. Such patterns are defined as inconsistent responses that can decrease the reliability and validity of self-report data (Schell et al., 2022). It was mandatory to answer all the items in the questionnaire because they were made 'required'. Hence, no values were missing in the final sample.

Univariate outliers were assessed using standardised z-scores, with no values exceeding the ±3.29 threshold (Tabachnick & Fidell, 2014). Multivariate outliers were examined by Mahalanobis distance. A significance threshold of $p < .001$ is suggested for large datasets, especially for CFA (Hair et al., 2019). The chi-square value for 44 degrees of freedom at $p < .001$ is 78.750 (Hole, 2005) and the maximum Mahalanobis distance observed in the dataset was 70.800. These results supported the suitability of the dataset for subsequent factor-analytic procedures.

In large samples, sampling distribution tends to approximate normality even when item-level distributions deviate from normality (Field, 2009). In line with the Central Limit Theorem (Ghasemi & Zahediasl, 2012), parametric statistical procedures were appropriate given the sample size.

Descriptive Statistics

Participants

The age range of participants was 18-68 years (M = 24.871, SD = 7.586). Although this covered a wide range, the majority were young adults. 54.2% of participants were aged 23 years (N = 573) and 30.1% were aged 22 years (N = 318). There were 49.1% (N = 520) males and 50.9% (N = 538) females. Only 1.5% of participants (N = 16) reported that they were diagnosed with an AD. The dataset mainly represented a non-clinical population. Refer to Table 1.

Table 1
Demographic data

Variables	Groups	Frequency	%
Gender	Male	520	49.1
	Female	538	50.9
Anxiety Diagnosis	Yes	16	1.5
	No	1042	98.5

Source: Author's own work

The Screen for Adult Anxiety Related Disorders (SCAARED)

Across the 44 SCAARED items, participants reported experiencing symptoms on some days rather than frequently (*M* = 0.812-1.018, *SD* = 0.696-0.753). Additionally, Kilic and Uysal (2022) noted that item-total correlations as low as 0.200 is acceptable for scales with two or three categories. Following the guideline for a three-point response format, seven items demonstrated total correlations between 0.148-0.188. Nevertheless, "Cronbach's Alpha if item deleted" ranged between 0.821-0.828 across all items, indicating that removal of any individual item would not meaningfully improve internal consistency. Therefore, no items were removed. Refer to Table 2.

Table 2
Descriptive statistics of the 44-items in SCAARED

Item	Response Categories			M	SD	Skewness	Kurtosis	Item-total Correlation
	0	1	2					
1	297	540	221	0.928	0.696	0.098	-0.936	0.317
2	309	503	246	0.940	0.722	0.090	-1.078	0.249
3	280	535	243	0.965	0.703	0.049	-0.971	0.169
4	345	478	235	0.896	0.733	0.165	-1.129	0.266
5	310	505	243	0.937	0.721	0.095	-1.070	0.274
6	371	466	221	0.858	0.735	0.229	-1.125	0.361
7	314	504	240	0.930	0.721	0.105	-1.069	0.278
8	278	525	255	0.978	0.710	0.031	-1.012	0.163
9	351	473	234	0.889	0.736	0.177	-1.139	0.357
10	292	529	237	0.948	0.706	0.073	-0.988	0.298
11	371	455	232	0.869	0.744	0.216	-1.170	0.340
12	342	500	216	0.881	0.717	0.180	-1.044	0.363
13	360	454	244	0.890	0.748	0.181	-1.196	0.330
14	319	489	250	0.935	0.731	0.101	-1.122	0.292
15	375	437	246	0.878	0.757	0.206	-1.230	0.403
16	341	478	239	0.904	0.734	0.153	-1.136	0.335
17	370	473	215	0.853	0.729	0.233	-1.099	0.365
18	267	505	286	1.018	0.723	-0.027	-1.085	0.156
19	342	470	246	0.909	0.740	0.146	-1.165	0.353
20	335	496	227	0.898	0.722	0.156	-1.073	0.324
21	291	516	251	0.962	0.715	0.055	-1.041	0.207
22	359	454	245	0.892	0.748	0.178	-1.197	0.333
23	301	523	234	0.937	0.709	0.091	-1.005	0.234
24	258	533	267	1.009	0.705	-0.012	-0.983	0.148
25	361	447	250	0.895	0.753	0.175	-1.220	0.359
26	381	471	206	0.835	0.727	0.264	-1.079	0.336

Table 2 *(continue)*

Item	Response Categories			M	SD	Skewness	Kurtosis	Item-total Correlation
	0	1	2					
27	328	496	234	0.911	0.724	0.136	-1.084	0.268
28	401	455	202	0.812	0.731	0.308	-1.090	0.377
29	317	490	251	0.938	0.730	0.097	-1.120	0.307
30	295	534	229	0.938	0.701	0.087	-0.964	0.212
31	267	510	281	1.013	0.720	-0.020	-1.068	0.188
32	299	486	273	0.975	0.735	0.038	-1.148	0.362
33	317	511	230	0.918	0.715	0.121	-1.037	0.253
34	287	521	251	0.967	0.712	0.048	-1.025	0.236
35	274	528	256	0.983	0.708	0.024	-1.002	0.172
36	351	458	249	0.904	0.747	0.158	-1.196	0.338
37	284	508	266	0.983	0.721	0.025	-1.075	0.153
38	341	493	224	0.889	0.723	0.170	-1.075	0.353
39	314	498	246	0.936	0.725	0.098	-1.093	0.278
40	364	455	239	0.882	0.746	0.195	-1.184	0.357
41	273	509	276	1.003	0.721	-0.004	-1.072	0.300
42	318	475	265	0.950	0.741	0.080	-1.174	0.294
43	281	534	243	0.964	0.703	0.050	-0.975	0.223
44	301	483	274	0.974	0.737	0.040	-1.157	0.245

Note. 0 = Not true or hardly ever true, 1 = Somewhat true or sometimes true, 2 = Very true or often true
Source*:* Author's own work

Inferential Statistics

Construct Validity

CFA evaluated the original four-factor structure of SCAARED proposed by Angulo et al. (2017). The hypothesised four-factor model demonstrated an excellent model fit (χ^2 = 1,080.231, df = 896, $p < .001$, CFI = 0.963, TLI = 0.961, RMSEA = 0.014, and SRMR = 0.037). The CFI and TLI were > 0.95, the RMSEA was < 0.06, and the SRMR was < 0.08. This indicates that the proposed model fit is excellent (Kline, 2016). Hypothesis 1 is accepted. Refer to Figure 1.

All items demonstrated statistically significant correlations with their respective latent factors ($p < .001$). Factor loadings of 0.300 or higher are generally acceptable (Tavakol & Wetzel, 2020). In Panic/ Agoraphobia subscale, item 9 was lower than the threshold. In GAD subscale, items 3, 5, 7, 9, 10, and 11 had low factor loadings. Item 1 from SAD subscale and item 6 from SEP subscale also demonstrated weak relationships with their respective factors. However, remaining items achieved acceptable factor loadings, implying that most items appropriately represent their constructs. Refer to Table 3.

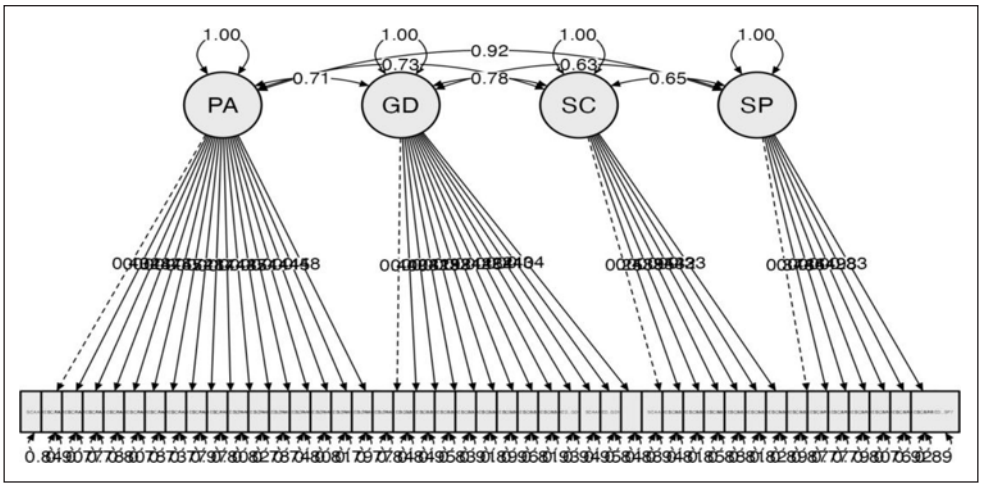

Figure 1. JASP CFA Model Plot of the SCAARED
Source: Author's own work

Table 3
Factor loadings of the 44-items in SCAARED

Factor	Indicator	Std. Estimate	Std. Error	*p*
Panic/Agoraphobia (PA)	SCAARED_PA1	0.396	0.031	< .001
	SCAARED_PA2	0.324	0.031	< .001
	SCAARED_PA3	0.484	0.026	< .001
	SCAARED_PA4	0.472	0.026	< .001
	SCAARED_PA5	0.449	0.027	< .001
	SCAARED_PA6	0.470	0.028	< .001
	SCAARED_PA7	0.524	0.024	< .001
	SCAARED_PA8	0.477	0.026	< .001
	SCAARED_PA9	0.170	0.036	< .001
	SCAARED_PA10	0.444	0.027	< .001
	SCAARED_PA11	0.427	0.029	< .001
	SCAARED_PA12	0.469	0.026	< .001
	SCAARED_PA13	0.511	0.023	< .001
	SCAARED_PA14	0.443	0.030	< .001
	SCAARED_PA15	0.436	0.028	< .001
	SCAARED_PA16	0.454	0.027	< .001
	SCAARED_PA17	0.480	0.026	< .001
Generalised Anxiety (GD)	SCAARED_GD1	0.397	0.035	< .001
	SCAARED_GD2	0.397	0.033	< .001
	SCAARED_GD3	0.225	0.037	< .001
	SCAARED_GD4	0.413	0.033	< .001
	SCAARED_GD5	0.293	0.035	< .001
	SCAARED_GD6	0.331	0.035	< .001
	SCAARED_GD7	0.207	0.040	< .001
	SCAARED_GD8	0.436	0.033	< .001

Table 3 *(continue)*

Factor	Indicator	Std. Estimate	Std. Error	*p*
	SCAARED_GD9	0.263	0.037	< .001
	SCAARED_GD10	0.237	0.038	< .001
	SCAARED_GD11	0.213	0.039	< .001
	SCAARED_GD12	0.395	0.033	< .001
	SCAARED_GD13	0.343	0.035	< .001
Social Anxiety (SC)	SCAARED_SC1	0.251	0.038	< .001
	SCAARED_SC2	0.434	0.034	< .001
	SCAARED_SC3	0.389	0.035	< .001
	SCAARED_SC4	0.349	0.036	< .001
	SCAARED_SC5	0.434	0.035	< .001
	SCAARED_SC6	0.423	0.035	< .001
	SCAARED_SC7	0.326	0.038	< .001
Separation Anxiety (SP)	SCAARED_SP1	0.366	0.033	< .001
	SCAARED_SP2	0.476	0.029	< .001
	SCAARED_SP3	0.459	0.030	< .001
	SCAARED_SP4	0.443	0.031	< .001
	SCAARED_SP5	0.486	0.028	< .001
	SCAARED_SP6	0.283	0.036	< .001
	SCAARED_SP7	0.331	0.034	< .001

Source: Author's own work

Internal Consistency

The total scale had a Cronbach's α of 0.827 and a McDonald's ω of 0.837, indicating excellent reliability (Nunnally, 1978). Across subscales, Panic/Agoraphobia showed the highest internal consistency (α = 0.749, ω = 0.765). The internal consistency of GAD (α = 0.554, ω = 0.524), SAD (α = 0.474, ω = 0.466) and SEP (α = 0.509, ω = 0.523) were beneath the recommended thresholds. These lower coefficients suggest that there is limited homogeneity among items within the domains.

As a result, Hypotheses 2.1 and 2.2 are accepted but Hypotheses 2.3, 2.4 and 2.5 were rejected. Refer to Table 4.

Table 4
Internal consistency of SCAARED and its subscales

Scale / Subscale	*k*	*M*	*SD*	Cronbach's α	McDonald's ω
Total SCAARED	44	40.774	11.019	0.827	0.837
Panic/Agoraphobia	17	15.274	5.577	0.749	0.765
GAD	13	12.514	3.712	0.554	0.524
SAD	7	6.708	2.457	0.474	0.466
SEP	7	6.278	2.561	0.509	0.523

Note. k depicts number of items, *M* represents Mean, *SD* indicated Standard Deviation
Source: Author's own work

Convergent Validity

Convergent validity was examined using Pearson correlation coefficients between SCAARED subscales and corresponding DSM-5 dimensional anxiety measures. Panic ($r = 0.557, p < .001$) and Agoraphobia ($r = 0.558, p < .001$) subscales demonstrated strong convergent validity (Cohen, 1988). GAD, SAD, and SEP subscales were not reported because low reliability can undermine the ability to detect associations with the respective measurements (Fu et al., 2022). Hypotheses 3.1 and 3.2 are therefore accepted whilst hypotheses 3.3, 3.4 and 3.5 were not tested.

DISCUSSION

Results Summary

This study evaluated the psychometric properties of SCAARED in a Malaysian adult sample. The findings provide preliminary evidence for the SCAARED among English-speaking Malaysian adults. The total-scale demonstrated excellent internal consistency, indicating that the items functioned coherently as a general measure of anxiety. The Panic/Agoraphobia subscale showed acceptable reliability while the GAD, SAD, and SEP subscales did not meet recommended reliability thresholds. Convergent validity was supported for Panic and Agoraphobia through statistically significant positive associations with corresponding DSM-5 dimensional measures. Convergent validity for GAD, SAD, and SEP was not examined due to their low reliability. These findings are consistent with previous studies where the broad SCAARED structure was supported, but certain subscales required culturally informed interpretation. Refer to Table 5.

Table 5
Summary of results

Hypothesis	Sub-Hypothesis	Results	Accepted / Rejected
The original four-factor structure of the SCAARED will demonstrate acceptable model fit in the Malaysian context, as assessed by CFA fit indices.	N/A	The four-factor model showed an excellent fit (χ^2 = 1,080.231, *df* = 896, CFI = 0.963, TLI = 0.961, RMSEA = 0.014, SRMR = 0.037), confirming suitability of the SCAARED structure in the Malaysian context.	Accepted
The total SCAARED scale and its subscales will exhibit acceptable internal consistency in the Malaysian adult population.	The total SCAARED scale will exhibit acceptable internal consistency in the Malaysian adult population.	The total SCAARED scale demonstrated good internal consistency ($\alpha = 0.827$, $\omega = 0.837$), indicating high reliability for assessing overall anxiety symptoms in Malaysian adults.	Accepted

Table 5 *(continue)*

Hypothesis	Sub-Hypothesis	Results	Accepted / Rejected
	The Panic/Agoraphobia subscale of the SCAARED will exhibit acceptable internal consistency in the Malaysian adult population.	The Panic/Agoraphobia subscale showed acceptable reliability (α = 0.749, ω = 0.765), demonstrating adequate internal consistency for this domain.	Accepted
	The GAD subscale of the SCAARED will exhibit acceptable internal consistency in the Malaysian adult population.	The GAD subscale demonstrated low internal consistency (α = 0.554, ω = 0.524), which fell below recommended thresholds, indicating inadequate reliability.	Rejected
	The SAD subscale of the SCAARED will exhibit acceptable internal consistency in the Malaysian adult population.	The SAD subscale showed weak internal consistency (α = 0.474, ω = 0.466), indicating insufficient reliability among items within this domain.	Rejected
	The SEP subscale of the SCAARED will exhibit acceptable internal consistency in the Malaysian adult population.	The SEP subscale demonstrated inadequate reliability (α = 0.509, ω = 0.523), suggesting that items did not function cohesively in this sample.	Rejected
The SCAARED subscales will show significant positive correlations with the respective DSM-5 dimensional anxiety scales, with moderate to strong effect sizes for convergent validity.	The Panic subscale of the SCAARED will demonstrate acceptable convergent validity when compared with the PD-D.	The Panic subscale demonstrated strong convergent validity with the DSM-5 PD-D scale ($r = 0.557$, $p < .001$), showing a strong positive association.	Accepted
	The Agoraphobia subscale of SCAARED will demonstrate acceptable convergent validity when compared with the AG-D.	The Agoraphobia subscale showed strong convergent validity with the DSM-5 AG-D scale ($r = 0.558$, $p < .001$), indicating a robust positive relationship.	Accepted
	The GAD subscale of the SCAARED will demonstrate acceptable convergent validity when compared with the GAD-D.	N/A	N/A
	The SAD subscale of the SCAARED will demonstrate acceptable convergent validity when compared with the SAD-D.	N/A	N/A
	The SEP subscale of the SCAARED will demonstrate acceptable convergent validity when compared with the SEP-D.	N/A	N/A

Source: Author's own work

FINDINGS AND INTERPRETATION

Descriptive Analysis

Most of the participants were young adults in their early 20s. Such a developmental stage is typically marked with identity exploration, academic and career planning, and the negotiation of new responsibilities (Wong et al., 2024). These life transitions can increase situational anxiety about performance, finances, and interpersonal evaluation without the presence of clinical psychopathology (Luyckx et al., 2011). This can be evidence of psychometric performance in a community sample, rather than diagnostic utility. It also aligns with the demographics as the sample was mainly non-clinical.

The relatively narrow age range in the study helped to improve internal validity by lessening the variability expected from different life stages (Treadwell et al., 2011). Thus, the factor structure could be examined with higher precision in a community-based young adult sample. However, such homogeneity can limit the variability of symptom expression (Lakes, 2013). When variability is reduced, it is possible that there will be lower inter-item correlations and lower internal consistency estimates (Fife et al., 2012), particularly as items refer to subtle differences in anxiety experiences. This aligns with the lower internal consistency observed in several SCAARED subscales.

Construct Validity

The CFA results showed an excellent model fit of the four-factor structure. This supports that the scale is an effective measure of broad latent dimensions in this Malaysian population and it represents anxiety concepts the same as the original conceptualisation (Angulo et al., 2017). Nevertheless, excellent global fit does not necessarily imply that item functioning is optimal (Schmitt, 2011). Nine items revealed modest factor loadings suggesting that the broader construct was well supported, but some items were less representative of their respective factors.

Item 18 ("When I get anxious, my heart beats fast") of the Panic/Agoraphobia domain loaded below the threshold. Even everyday situations can cause one to feel like their heart is racing when it is not a situation that is specifically related to anxiety. For example, caffeine intake, exhaustion, feeling warm, or even being ill can all lead to physical arousal as well (Suvi et al., 2017). Thus, it is possible that the item reflects a general somatic sensitivity that may disperse its shared variance across factors and reduce its loading on panic specifically.

Six of the low loading items appeared in GAD subscale, including "It is hard for me to stop worrying", "I worry about things working out for me", and "I worry about how well I do things". High achievement standards and strong family obligations are deeply ingrained values in Malaysia, encouraging individuals to think extensively about success and responsibility (Chua et al., 2018; Tan et al., 2019). In Malaysian cultural norms, worries about performance can reflect conscientious striving and responsible behaviour rather than emotional disturbance. Consequently, respondents may

endorse these items because they resonate with cultural expectations, yet they do not necessarily experience the associated physiological tension and functional impairment that characterise clinical GAD. Worry can also appear in many mental health conditions, which makes it a transdiagnostic feature. For example, it cuts across anxiety, depression, and stress, reflecting a broad negative affectivity factor (Kertz et al., 2012). Furthermore, GAD-7 detects symptoms of SAD and panic disorder, functioning as an overall anxiety index (Beard & Björgvinsson, 2014). Thus, low loadings can arise because items tap general negative affectivity rather than a narrow GAD construct.

The weaker items in SAD and SEP subscales, namely item 3 ("I don't like to be with people I don't know well") and item 30 ("I don't like to be away from my family"), can be read as expressions of politeness, caution, or family closeness rather than indicators of pathological fear (Tan et al., 2019; Vaswani et al., 2022). This pattern mirrors findings from the Malaysian validation of SCARED (Ang, 2020), which also reported similar item-level weaknesses and did not obtain an acceptable fit for either the four-factor or five-factor models. Hence, it is necessary to investigate if different phrasings or response forms could distinguish the conformity to social norms at the level of anxiety more clearly.

Items with lower loadings were retained because they reflect theoretically relevant and culturally interpretable aspects of anxiety. Nevertheless, they were not empirically confirmed in this study and should be examined further using measurement invariance testing, qualitative approaches, or alternative modelling strategies.

Internal Consistency

The excellent reliability of the total-scale indicates that the measure is capable of capturing shared features of anxiety, such as physiological arousal and cognitive distress, in a stable manner across respondents. At the same time, very high internal consistency can also reflect substantial overlap in item content rather than a finely differentiated construct (Clark & Watson, 2019). This is important when interpreting the value of total-scale scores versus subscale scores.

Symptoms such as heart palpitations, dizziness, and breathlessness are concrete physical experiences that are easier to recognise than one's own thoughts. The physical nature of anxiety symptoms is easier for individuals to identify because recognising bodily sensations requires less introspective ability than recognising cognitive processes (Clemente et al., 2024). The high internal consistency of Panic/Agoraphobia subscale therefore suggests that Malaysians recognise and report bodily manifestations of anxiety in a consistent manner, indicating that anxiety may be conceptualised as an embodied experience. Cross-cultural studies have indicated that individuals from Asian societies usually express their distress through physical symptoms and tend to minimise their emotional or psychological side of the matter (Cackovic et al., 2023). Since physical discomfort is generally

more acceptable from a social point of view than psychological distress (Kowalski & Peipert, 2019), respondents might feel more comfortable to report somatic symptoms while they may not report as much cognitive or interpersonal issues in self-report measures. Such a response pattern can thus lead to higher internal consistency within the somatic subscale, which in turn may reflect cultural norms concerning which forms of distress are considered acceptable to disclose.

In comparison, GAD, SAD and SEP domains contained items that covered a broader range of content. GAD subscale in this study included statements about worry as a trait, the content of worry and the consequences of worry on functioning, for example "I am a worrier," "I worry about being as good as other people," and "I have difficulty sleeping". These items represent both the process of worrying and the appraisal of worry, which are conceptually distinct in Wells (2005)'s metacognitive model of GAD. This mix provides good clinical breadth and reflects how GAD presents in daily life, yet it also reduces internal homogeneity. When items tap different levels of a model, respondents may reasonably endorse some aspects but not others. Internal consistency then decreases even though each item is theoretically relevant. Instead of viewing lower reliability as purely negative, it can be interpreted as evidence that GAD subscale is capturing several interrelated but not identical facets of anxious thinking. Future research could explore whether separating process items from appraisal items would meaningfully improve reliability, or whether the current multidimensionality better reflects the complexity of GAD in Malaysian adults.

Similarly, the items on SAD subscale cover evaluative fears and social reserve, yet in Malaysian contexts social restraint can represent respect, safety or modesty rather than fear. Collectivist values emphasise humility and deference, so reserved behaviour could reflect adherence to social norms rather than pathological avoidance (Vaswani et al., 2022). Moreover, collectivist cultures are generally more accepting of humility and withdrawn behaviours, viewing them as expressions of social propriety rather than indicators of anxiety (Brockveld et al., 2014). If some participants endorsed these items because they viewed quietness as polite, while others endorsed them because they experienced distressing fear of negative evaluation, the shared variance among items would fall. Reliability then decreases not because the subscale is poorly constructed but because its indicators carry more than one meaning within this culture. This ambiguity raises a broader question about whether Western-framed SAD items can clearly distinguish disorder from culturally valued modesty in collectivist societies.

SEP subscale was designed to capture separation-related anxiety while also reflecting family closeness that is common in Asian contexts. In Malaysian culture, family and kinship are the major support system of social networks, and children are expected to show good and responsible behaviour

towards their parents thus giving great value to the keeping of close and harmonious intergenerational relationships (Aziz & Yusooff, 2012). Therefore, the reaction of the separation, accompanied by the feeling of distress, can either point to anxious attachment, normal familial closeness, or even situational obligations rather than an indication of pathological anxiety. In adult samples, additional contextual factors such as multigenerational living arrangements, migration for work or study, and caregiving responsibilities may further contribute to variability in item endorsement. Rather than treating this as a psychometric flaw, the lower internal consistency can point to conceptual heterogeneity in how separation from attachment figures is understood in Malaysian adulthood. This suggests that SEP scores should be interpreted within relational and cultural frameworks, rather than exclusively as measures of anxiety pathology.

Apart from that, short scales with fewer than 10 items commonly produce lower internal consistency and this can occur even when the items are conceptually appropriate (Pallant, 2020). In the present study, Panic/Agoraphobia subscale was the longest with 17 items. The GAD scale had 13 items, and SAD and SEP subscales had seven items each. This pattern was reflected in the findings because internal consistency scores were highest for the scales with more items and lowest for those with the fewest items. Although other SCAARED validation studies have reported strong reliability for the shorter subscales, they translated the instrument, which possibly enhanced conceptual clarity and cultural comprehensibility. Although only those fluent in English participated in the present study, educational level was not assessed, introducing variability in how items were understood (Alavi et al., 2026). Hence, cultural and linguistic adaptation might be a significant factor that leads to higher internal consistency.

Convergent Validity

The convergent validity analysis demonstrated significant positive associations between Panic and Agoraphobia subscales and their corresponding DSM-5 dimensional anxiety measures. As hypothesised, these domains showed meaningful convergence with theoretically aligned constructs, providing support for the validity of these subscales within this Malaysian adult sample. However, as GAD, SAD, and SEP subscales did not meet reliability criteria, convergent validity was not assessed for these domains, and no conclusions can be drawn regarding their external associations. This lack of evidence identifies an important direction for future work to determine whether these subscales show comparable relationships with DSM-based measures in Malaysian samples.

Unlike previous SCAARED validation studies that relied on broad distress measures, the present study employed DSM-5 dimensional anxiety measures that assess specific anxiety symptom domains. The strong correlations for Panic and Agoraphobia subscales are also

consistent with the close alignment between physiological anxiety symptoms and DSM-5 diagnostic criteria, which both SCAARED and DSM-5 dimensional measures are based on (American Psychiatric Association, 2013a). In contrast, measures used in earlier validations, assess broader emotional distress and somatic symptoms rather than anxiety-specific constructs. Although such measures often produce stronger correlations by capturing non-specific features of internalising distress, they may overestimate convergence. Accordingly, the strong correlations observed for Panic and Agoraphobia subscales likely reflect the specificity of the comparison instruments. This approach prioritises conceptual accuracy over inflated correlations and represents a methodological strength.

CONCLUSION

Overall, this study provides initial evidence that SCAARED's original four-factor structure is applicable among Malaysian adults and that the total-scale functions as a reliable index of anxiety symptoms. The Panic/Agoraphobia domain showed more consistent subscale performance and supported convergent validity with DSM-5 dimensional measures (American Psychiatric Association, 2013a). Lower reliability in the GAD, SAD, and SEP subscales suggests that subscale interpretation should be interpreted with caution. These findings support the use of SCAARED for broad screening use in Malaysia while highlighting areas for further validation, cultural refinement, and clinical utility testing.

IMPLICATION OF THE STUDY

This study provides initial Malaysian psychometric evidence for SCAARED and addresses a methodological gap in adult anxiety assessment research locally. The strong global fit supports the interpretability of the four-factor structure among Malaysian adults. At the same time, lower reliability in several subscales supports cultural relativism by indicating that symptom meaning and organisation may vary across cultures. This reinforces the importance of culturally sensitive criteria that are statistically sound.

Practically, the findings support using the SCAARED total-scale for screening and general assessment for English-speaking Malaysian adults. The Panic/Agoraphobia subscale appears more interpretable as a domain score. In contrast, GAD, SAD, and SEP subscale scores should be interpreted cautiously, alongside clinical judgement. Retaining all 44 items also supports comparability with international research and may be useful for broader monitoring purposes, while further validation work continues.

LIMITATION AND RECOMMENDATION FOR FUTURE RESEARCH

The sample was mainly non-clinical, with most of them being young adults. This limits generalisability of the findings to older adults and clinical populations with higher symptom severity. Online recruitment and unsupervised administration may have led to response biases like socially desirable

responding. The absence of clinician-administered diagnostic interviews in the study also limits the conclusions about diagnostic utility.

Additionally, ethnicity data were not collected. This limits the ability to examine if items function differently across the different cultural groups in Malaysia. Information on educational level was also not assessed. Despite fluency in English being a prerequisite, the level of understanding on the items is not known (Alavi et al., 2026). Since the data was collected only at one point, it was also not possible to assess test-retest reliability and sensitivity to change.

Future studies should recruit more diverse samples across age, geography, and clinical status, including representation of major ethnic groups to evaluate performance across Malaysia's sociocultural contexts. Methodologically, incorporating diagnostic interviews or structured clinical evaluations would allow stronger conclusions about criterion validity. Cognitive interviewing or supervised administration could clarify how respondents interpret culturally sensitive items and reduce comprehension variability.

Future research may begin with EFA in a new sample, followed by CFA in an independent or split sample to evaluate the stability of structure. Where items consistently show weak performance, culturally informed rephrasing could be explored while maintaining accuracy to the original content for comparability. Longitudinal designs will establish test-retest reliability and sensitivity to change for monitoring intervention outcomes.

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REFERENCES

Abubakar, A., & Fischer, R. (2011). The factor structure of the 12-item general health questionnaire in a literate Kenyan population. *Stress and Health*, *28*(3), 248-254. https://doi.org/10.1002/smi.1420

Ahmed, S. K. (2024). Research methodology simplified: How to choose the right sampling technique and determine the appropriate sample size for research. *Oral Oncology Reports, 12*, Article 100662. https://doi.org/10.1016/j.oor.2024.100662

Alavi, M., Le Lagadec, D., & Cleary, M. (2026). Challenges of cross-cultural validation of clinical assessment measures: A practical introduction. *Journal of Advanced Nursing, 82*(1), 941-949. https://doi.org/10.1111/jan.16906

American Psychiatric Association. (2013a). *Diagnostic and statistical manual of mental disorders* (5th ed.). American Psychiatric Association Publishing. https://doi.org/10.1176/appi.books.9780890425596

American Psychiatric Association. (2013b). *Severity measure for agoraphobia—Adult*. https://www.psychiatry.org/getmedia/3345c156-1aac-4e29-ac61-1c6541cb39be/APA-DSM5TR-SeverityMeasureForAgoraphobiaAdult.pdf

American Psychiatric Association. (2013c). *Severity measure for generalised anxiety disorder—Adult*. https://www.psychiatry.org/getmedia/b1a256c4-1304-4610-8aca-0cc70b46ff53/APA-DSM5TR-SeverityMeasureForGeneralisedAnxietyDisorderAdult.pdf

American Psychiatric Association. (2013d). *Severity measure for panic disorder—Adult*. https://www.psychiatry.org/getmedia/6ab8ea4f-e810-4c0c-

b41c-16838293506d/APA-DSM5TR-SeverityMeasureForPanicDisorderAdult.pdf

American Psychiatric Association. (2013e). *Severity measure for separation anxiety disorder—Adult*. https://www.psychiatry.org/getmedia/538a62c3-2e1e-4bc3-bafd-7a02efad4937/APA-DSM5TR-SeverityMeasureForSeparationAnxietyDisorderAdult.pdf

American Psychiatric Association. (2013f). *Severity measure for social anxiety disorder (social phobia)—Adult*. https://www.psychiatry.org/File%20Library/Psychiatrists/Practice/DSM/APA_DSM5_Severity-Measure-For-Social-Anxiety-Disorder-Adult.pdf

Ang, C. S. (2020). Anxiety in Malaysian children and adolescents: Validation of the Screen for Child Anxiety Related Emotional Disorders (SCARED). *Trends in Psychiatry and Psychotherapy, 42*(1), 7-15. https://doi.org/10.1590/2237-6089-2018-0109

Angulo, M., Rooks, B. T., Gill, M., Goldstein, T., Sakolsky, D., Goldstein, B., Monk, K., Hickey, M. B., Diler, R. S., Hafeman, D., Merranko, J., Axelson, D., & Birmaher, B. (2017). Psychometrics of the Screen for Adult Anxiety Related Disorders (SCAARED): A new scale for the assessment of DSM-5 anxiety disorders. *Psychiatry Research, 253*, 84-90. https://doi.org/10.1016/j.psychres.2017.02.034

Atkinson, T. M., Rosenfeld, B. D., Sit, L., Mendoza, T. R., Fruscione, M., Lavene, D., Shaw, M., Li, Y., Hay, J., Cleeland, C. S., Scher, H. I., Breitbart, W. S., & Basch, E. (2011). Using confirmatory factor analysis to evaluate construct validity of the Brief Pain Inventory (BPI). *Journal of Pain and Symptom Management, 41*(3), 558-565. https://doi.org/10.1016/j.jpainsymman.2010.05.008

Aziz, R. A., & Yusooff, F. (2012). Intergenerational relationships and communication among the rural aged in Malaysia. *Asian Social Science, 8*(6), 184-190. https://doi.org/10.5539/ass.v8n6p184

Balsamo, M., Cataldi, F., Carlucci, L., & Fairfield, B. (2018). Assessment of anxiety in older adults: A review of self-report measures. *Clinical Interventions in Aging, 13*, 573-593. https://doi.org/10.2147/CIA.S114100

Beard, C., & Björgvinsson, T. (2014). Beyond generalised anxiety disorder: Psychometric properties of the GAD-7 in a heterogeneous psychiatric sample. *Journal of Anxiety Disorders, 28*(6), 547-552. https://doi.org/10.1016/j.janxdis.2014.06.002

Birmaher, B., Khetarpal, S., Brent, D., Cully, M., Balach, L., Kaufman, J., & Neer, S. M. (1997). The Screen for Child Anxiety Related Emotional Disorders (SCARED): Scale construction and psychometric characteristics. *Journal of the American Academy of Child & Adolescent Psychiatry, 36*(4), 545-553. https://doi.org/10.1097/00004583-199704000-00018

Boateng, G. O., Neilands, T. B., Frongillo, E. A., Melgar-Quiñonez, H. R., & Young, S. L. (2018). Best practices for developing and validating scales for health, social, and behavioral research: A primer. *Frontiers in Public Health, 6*, Article 149. https://doi.org/10.3389/fpubh.2018.00149

Brockveld, K. C., Perini, S. J., & Rapee, R. M. (2014). Social anxiety and social anxiety disorder across cultures. In S. G. Hofmann & P. M. DiBartolo (Eds.), *Social anxiety: Clinical, developmental, and social perspectives* (3rd ed., pp. 141-158). Academic Press. https://doi.org/10.1016/B978-0-12-394427-6.00006-6

Bujang, M. A. (2021). A step-by-step process on sample size determination for medical research. *Malaysian Journal of Medical Sciences, 28*(2), 15-27. https://doi.org/10.21315/mjms2021.28.2.2

Cackovic, C., Nazir, S., & Marwaha, R. (2023). Panic disorder. In *StatPearls*. StatPearls Publishing. https://www.ncbi.nlm.nih.gov/books/NBK430973/

Chua, R. Y., Ng, Y. L., & Park, M. S.-A. (2018). Mitigating academic distress: The role of psychological capital in a collectivistic Malaysian university student sample. *The Open Psychology Journal, 11*(1), 171-183. https://doi.org/10.2174/1874350101811010171

Clark, L. A., & Watson, D. (2019). Constructing validity: New developments in creating objective measuring instruments. *Psychological Assessment, 31*(12), 1412-1427. https://doi.org/10.1037/pas0000626

Clemente, R., Murphy, A., & Murphy, J. (2024). The relationship between self-reported interoception and anxiety: A systematic review and meta-analysis. *Neuroscience & Biobehavioral Reviews, 167*, 1-12. https://doi.org/10.1016/j.neubiorev.2024.105923

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Routledge.

Coldur, E. O., Cokmus, F. P., Dikici, D. S., & Aydemir, O. (2020). The validity and reliability of DSM-5 Separation Anxiety Disorder Severity Scale-Adult form. *Dusunen Adam the Journal of Psychiatry and Neurological Sciences, 33*, 237-243. https://doi.org/10.14744/dajpns.2020.00087

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika, 16*(3), 297-334. https://doi.org/10.1007/BF02310555

Cronbach, L. J., & Meehl, P. E. (1955). Construct validity in psychological tests. *Psychological Bulletin, 52*(4), 281-302. https://doi.org/10.1037/h0040957

Cueva, S. S., Esteban, Y. A., Cueva, P. S., Birmaher, B., & Marín, F. A. (2021). Psychometrics of the Spanish version of the Screen for Adult Anxiety Related Disorders (SCAARED). *Frontiers in Psychiatry, 12*. https://doi.org/10.3389/fpsyt.2021.589422

De Ayala, R. J. (2009). The theory and practice of item response theory. *Psychometrika, 75*(4). https://doi.org/10.1007/s11336-010-9179-z

Farani, A. R., Khabaz, S. A., Nabavi, M., Didehvar, R., Masuomian, S., & Zahiriyan, M. (2022). The psychometric properties of the Persian version of the Screen for Adult Anxiety Related Disorders (SCAARED) in patients with anxiety disorders. *Brain and Behavior, 12*(7). https://doi.org/10.1002/brb3.2647

Field, A. (2009). *Discovering statistics using SPSS* (3rd ed.). SAGE Publications.

Fife, D. A., Mendoza, J. L., & Terry, R. (2012). The assessment of reliability under range restriction. *Educational and Psychological Measurement, 72*(5), 862-888. https://doi.org/10.1177/0013164411430225

Fu, X., Zhang, Z., Zhou, Y., Chen, Q., Yang, L.-Z., & Li, H. (2022). The split-half reliability and construct validity of the virtual reality-based path integration task in the healthy population. *Brain Sciences, 12*(12), Article 1635. https://doi.org/10.3390/brainsci12121635

Ghasemi, A., & Zahediasl, S. (2012). Normality tests for statistical analysis: A guide for non-statisticians. *International Journal of Endocrinology and Metabolism, 10*(2), 486-489. https://doi.org/10.5812/ijem.3505

Gomez, R., Stavropoulos, V., & Griffiths, M. D. (2020). Confirmatory factor analysis and exploratory structural equation modelling of the factor structure of the Depression Anxiety and Stress Scales-21. *PLoS ONE, 15*(6), 1-16. https://doi.org/10.1371/journal.pone.0233998

Goodboy, A. K., & Martin, M. M. (2020). Omega over alpha for reliability estimation of unidimensional communication measures. *Annals of the International Communication Association, 44*(4), 422-439. https://doi.org/10.1080/23808985.2020.1846135

Groves, D., Binasis, T., Wootton, B., & Moses, K. (2023). Psychometric properties of the Generalised Anxiety Disorder Dimensional Scale

in an Australian sample. *PLoS ONE, 18*(6), 1-12. https://doi.org/10.1371/journal.pone.0286634

Gunzler, D. D., Dolata, J., Figueroa, M., Kauffman, K., Pencak, J., Sajatovic, M., & Sehgal, A. R. (2024). Using latent variables to improve the management of depression among hemodialysis patients. *Renal Failure, 46*(2). https://doi.org/10.1080/0886022X.2024.2350767

Haig, B. D. (2023). Repositioning construct validity theory: From nomological networks to pragmatic theories and their evaluation by explanatory means. *Perspectives on Psychological Science, 20*(2). https://doi.org/10.1177/17456916231195852

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis* (8th ed.). Cengage Learning EMEA. https://eli.johogo.com/Class/CCU/SEM/_Multivariate%20Data%20Analysis_Hair.pdf

Herskovits, M. J. (1972). *Cultural relativism: Perspectives in cultural pluralism*. Random House.

Hofstede, G. (2011). Dimensionalizing cultures: The Hofstede model in context. *Online Readings in Psychology and Culture, 2*(1), 1-26. https://doi.org/10.9707/2307-0919.1014

Hole, G. (2005). *Table of critical chi-square values*. University of Sussex. https://users.sussex.ac.uk/~grahamh/RM1web/ChiSquareTable2005.pdf

Hwang, I., Chin, S., Mun, S., You, M. J., Moon, W., & Lho, S. K. (2024). Psychometrics of the Korean version of the Screen for Adult Anxiety Related Disorders (SCAARED). *BMC Psychiatry, 24*(1). https://doi.org/10.1186/s12888-024-05800-5

Ismail, N. H., Jaafar, N. R. N., Woon, L. S. C., Ali, M. M., Dahlan, R., & Baharuddin, A. P. (2023). Psychometric properties of the Malay-version Beck Anxiety Inventory among adolescent students in Malaysia. *Frontiers in Psychiatry, 13*. https://doi.org/10.3389/fpsyt.2022.989079

Jeong, D., Aggarwal, S., Robinson, J., Kumar, N., Spearot, A., & Park, D. S. (2022). Exhaustive or exhausting? Evidence on respondent fatigue in long surveys. *Journal of Development Economics, 161*, Article 102992. https://doi.org/10.1016/j.jdeveco.2022.102992

Kang, J. I., & Kim, S. J. (2024). Psychometric analysis of the Obsessive-Compulsive Spectrum Self-Report and Social Anxiety Spectrum Self-Report in the Korean population. *Psychiatry Investigation, 21*(3), 265-274. https://doi.org/10.30773/pi.2023.0338

Kertz, S. J., Bigda-Peyton, J. S., Rosmarin, D. H., & Björgvinsson, T. (2012). The importance of worry across diagnostic presentations: Prevalence, severity and associated symptoms in a partial hospital setting. *Journal of Anxiety Disorders, 26*(1), 126-133. https://doi.org/10.1016/j.janxdis.2011.10.005

Khaiyom, J. H. A., Mukhtar, F., & Oei, T. P. (2019). A systematic review on the validated measures used to assess anxiety in Malaysia. *Malaysian Journal of Medicine and Health Sciences, 15*(SUPP1), 120-127. https://medic.upm.edu.my/upload/dokumen/2019042916011318_0321(Final)18.pdf

Khaiyom, J. H. A., Mukhtar, F., & Oei, T. P. S. (2021). Anxiety disorders in Malaysia from 2005 to 2015: A scoping review of their prevalence rates, associated factors, and predictors. *Journal of Health and Translational Medicine, 24*(2), 31-47. https://doi.org/10.22452/jummec.vol24no2.6

Kilic, A. F., & Uysal, I. (2022). To what extent are item discrimination values realistic? A new index for two-dimensional structures. *International Journal of Assessment Tools in Education, 9*(3), 728-740. https://doi.org/10.21449/ijate.1098757

Kline, R. B. (2016). *Principles and practice of structural equation modeling* (4th ed.). The Guilford Press.

Kowalski, R. M., & Peipert, A. (2019). Public- and self-stigma attached to physical versus psychological

disabilities. *Stigma and Health, 4*(2), 136-142. https://doi.org/10.1037/sah0000123

Lakes, K. D. (2013). Restricted sample variance reduces generalizability. *Psychological Assessment, 25*(2), 643-650. https://doi.org/10.1037/a0030912

Lebeau, R. T., Glenn, D. E., Hanover, L. N., Beesdo-Baum, K., Wittchen, H.-U., & Craske, M. G. (2012). A dimensional approach to measuring anxiety for DSM-5. *International Journal of Methods in Psychiatric Research, 21*(4), 258-272. https://doi.org/10.1002/mpr.1369

Li, C. H. (2016). Confirmatory factor analysis with ordinal data: Comparing robust maximum likelihood and diagonally weighted least squares. *Behavior Research Methods, 48*(3), 936-949. https://doi.org/10.3758/s13428-015-0619-7

Luyckx, K., De Witte, H., & Goossens, L. (2011). Perceived instability in emerging adulthood: The protective role of identity capital. *Journal of Applied Developmental Psychology, 32*(3), 137-145. https://doi.org/10.1016/j.appdev.2011.02.002

Ma'rof, A. A., Azam, M. N. D., & Rosnon, M. R. (2024). The impact of cultural values, emotional intelligence, social responsibility, and perceived social norms on helping behavior in Malaysian young adults. *International Journal of Academic Research in Business and Social Sciences, 14*(12), 496-510. https://doi.org/10.6007/IJARBSS/v14-i12/23999

McDonald, R. P. (1999). *Test theory*. Psychology Press.

Ministry of Health Malaysia. (2020). *NHMS 2011*. Institute for Public Health. https://iku.gov.my/nhms-2011

Niwenahisemo, L. C., Zhang, Q., Wang, W., Geng, D., Xu, H., Hu, J., Ma, L., Tan, J., Kong, Y., Hong, S., & Kuang, L. (2025). A comparative study of anxiety symptoms in Chinese and Rwandan adolescents: A cross-cultural measurement invariance study of the GAD-7 scale. *Frontiers in Psychiatry, 16*, Article 1571753. https://doi.org/10.3389/fpsyt.2025.1571753

Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). McGraw-Hill.

Oei, T. P. S., Sawang, S., Goh, Y. W., & Mukhtar, F. (2013). Using the Depression Anxiety Stress Scale 21 (DASS-21) across cultures. *International Journal of Psychology, 48*(6), 1018-1029. https://doi.org/10.1080/00207594.2012.755535

Pallant, J. (2020). *SPSS survival manual: A step by step guide to data analysis using IBM SPSS*. Routledge.

Rogers, P. (2024). Best practices for your confirmatory factor analysis: A JASP and lavaan tutorial. *Behavior Research Methods, 56*(7). https://doi.org/10.3758/s13428-024-02375-7

Schell, C., Godinho, A., & Cunningham, J. A. (2022). Using a consistency check during data collection to identify invalid responding in an online cannabis screening survey. *BMC Medical Research Methodology, 22*(1). https://doi.org/10.1186/s12874-022-01556-2

Schmitt, T. A. (2011). Current methodological considerations in exploratory and confirmatory factor analysis. *Journal of Psychoeducational Assessment, 29*(4), 304-321. https://doi.org/10.1177/0734282911406653

Shawaluddin, N. S., Awaluddin, S. M., Mahjom, M., Kuay, L. K., Lah, T. M. A. T., Kassim, M. S. A. bin, Ghazali, M., Lazim, R. M., Ismail, R., & Arip, M. (2023). Original article prevalence and factors associated with probable generalised anxiety disorder among healthcare workers working in medical laboratories of central Peninsular Malaysia during COVID-19 pandemic. *Malaysian Journal of Public Health Medicine, 23*(3), 53-63. https://iku.nih.gov.my/images/publication-2024/2.noor-syaqilah.pdf

Silove, D., Alonso, J., Bromet, E., Gruber, M., Sampson, N., Scott, K., Andrade, L., Benjet, C., Caldas de Almeida, J. M., De Girolamo, G., de Jonge, P., Demyttenaere, K., Fiestas, F., Florescu, S., Gureje, O., He, Y., Karam, E., Lepine, J.-P., Murphy, S., & Villa-Posada, J. (2015). Pediatric-onset and adult-onset separation anxiety disorder across countries in the World Mental Health Survey. *American Journal of Psychiatry, 172*(7), 647-656. https://doi.org/10.1176/appi.ajp.2015.14091185

Silva, C., Ferreira, R., Morgado, B., Alves, E., & Fonseca, C. (2024). Depression, loneliness and quality of life in institutionalised and non-institutionalised older adults in Portugal: A cross-sectional study. *Nursing Reports, 14*(3), 2340-2354. https://doi.org/10.3390/nursrep14030174

Smith, G. T., McCarthy, D. M., & Anderson, K. G. (2000). On the sins of short-form development. *Psychological Assessment, 12*(1), 102-111. https://doi.org/10.1037/1040-3590.12.1.102

So, K. K. F., Li, J., & Kim, H. (2026). A comparison of cross-sectional and longitudinal data in scale validation: The case of destination brand experience. *Journal of Hospitality Marketing & Management, 35*(3), 341-362. https://doi.org/10.1080/19368623.2025.2578656

Suvi, S., Timpmann, S., Tamm, M., Aedma, M., Kreegipuu, K., & Ööpik, V. (2017). Effects of caffeine on endurance capacity and psychological state in young females and males exercising in the heat. *Applied Physiology, Nutrition, and Metabolism, 42*(1), 68-76. https://doi.org/10.1139/apnm-2016-0206

Tabachnick, B. G., & Fidell, L. S. (2014). *Using multivariate statistics* (6th ed.). Pearson.

Tan, S. A., Nainee, S., & Tan, C. S. (2019). Filial piety and life satisfaction among Malaysian adolescents in a multi-ethnic, collectivist society. *Proceedings of the 2nd International Conference on Intervention and Applied Psychology*, 229. https://doi.org/10.2991/iciap-18.2019.12

Tavakol, M., & Wetzel, A. (2020). Factor Analysis: a means for theory and instrument development in support of construct validity. *International Journal of Medical Education*, 11, 245-247. https://doi.org/10.5116/ijme.5f96.0f4a

Treadwell, M. J., Alkon, A., Styles, L., & Boyce, W. T. (2011). Autonomic nervous system reactivity. *Nursing Research, 60*(3), 197-207. https://doi.org/10.1097/NNR.0b013e3182186a21

Vaishnavi, S., Connor, K., & Davidson, J. R. T. (2007). An abbreviated version of the Connor-Davidson Resilience Scale (CD-RISC), the CD-RISC2: Psychometric properties and applications in psychopharmacological trials. *Psychiatry Research, 152*(2-3), 293-297. https://doi.org/10.1016/j.psychres.2007.01.006

Vaswani, M., Esses, V. M., Newby-Clark, I. R., & Giguère, B. (2022). Cultural differences in fear of negative evaluation after social norm transgressions and the impact on mental health. *Frontiers in Psychology, 13*, Article 804841. https://doi.org/10.3389/fpsyg.2022.804841

Viladrich, C., Angulo-Brunet, A., & Doval, E. (2017). A journey around alpha and omega to estimate internal consistency reliability. *Anales de Psicología, 33*(3), 755. https://doi.org/10.6018/analesps.33.3.268401

Wang, S., Shi, X., Zhu, Y., & Wang, Z. (2022). Factor structure of the Chinese version of the Screen for Adult Anxiety Related Disorders (SCARED). *Asian Journal of Psychiatry, 73*, Article 103159. https://doi.org/10.1016/j.ajp.2022.103159

Wells, A. (2005). The metacognitive model of GAD: Assessment of meta-worry and relationship with DSM-IV generalised anxiety disorder. *Cognitive Therapy and Research, 29*(1), 107-121. https://doi.org/10.1007/s10608-005-1652-0

White, M. (2022). Sample size in quantitative instrument validation studies: A systematic review of articles published in Scopus, 2021. *Heliyon, 8*(12), Article e12223. https://doi.org/10.1016/j.heliyon.2022.e12223

Wong, W. P., Pheh, K.-S., & Tan, C. S. (2024). Effects of a character strengths intervention on emerging adults' identity formation, self-efficacy, and self-doubt. *Makara Human Behavior Studies in Asia, 28*(1). https://doi.org/10.7454/hubs.asia.1140424

Zhou, H., Chang, Y., Sakulsriprasert, C., Wongpakaran, T., Wongpakaran, N., Suradom, C., O'Donnell, R., & Jia, N. (2025). The validity and reliability of the Chinese version of the screening instrument for borderline personality disorder. *Psychiatry International, 6*(3), 1-14. https://doi.org/10.3390/psychiatryint6030108

Ziegler, M., Kemper, C. J., & Kruyen, P. (2014). Short scales—five misunderstandings and ways to overcome them. *Journal of Individual Differences, 35*(4), 185-189. https://doi.org/10.1027/1614-0001/a000148

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Artikel Ulasan

Impak Keterbatasan Komunikasi Terhadap Keberkesanan Produktiviti Pekerja Asing: Tinjauan Literatur Sistematik

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ABSTRAK

Produktiviti pekerja asing merupakan indikator utama yang menentukan kecekapan sesebuah organisasi dalam mencapai sasaran pengeluaran yang ditetapkan. Meskipun tenaga kerja asing memberikan sumbangan besar kepada output negara, namun isu berkaitan jurang komunikasi dan adaptasi budaya sering kali menjadi cabaran utama dalam mengekalkan kualiti kerja mereka. Kajian ini bertujuan untuk mengkaji secara sistematik kaedah penyelidikan terhadap pemboleh ubah-pemboleh ubah yang mempengaruhi produktiviti pekerja asing di sesebuah organisasi. Tinjaun literatur mengaplikasikan *Preferred Reporting Items for Systematic Reviews and Meta-Analyses* (PRISMA) 2020. Empat tahap PRISMA, iaitu pengenalpastian, saringan, kelayakan dan rangkuman digunakan untuk membuat penilaian kepada tinjauan literatur secara sistematik. Tempoh kajian yang layak disemak adalah diterbitkan dalam tempoh 5 tahun, dari 2020 hingga 2025 dan semakan telah dilakukan melalui dua pangkalan data terkemuka, iaitu *Scopus* dan *Google Scholar*. Daripada 1185 buah artikel yang dikenalpasti, hanya 17 buah artikel dipilih kerana memenuhi kriteria yang ditetapkan. Tinjauan terhadap artikel terpilih mendapati bahawa produktiviti di sesebuah organisasi dipengaruhi oleh tiga tema utama, iaitu halangan bahasa dan keterbatasan komunikasi, keselamatan dan kesihatan pekerja asing, dan persekitaran kerja yang tidak kondusif. Kesemua artikel membincangkan halangan bahasa dan keterbatasan komunikasi sebagai punca utama yang memberi kesan kepada produktiviti pekerja asing. Oleh itu, tinjauan literatur ini menegaskan bahawa produktiviti yang mampan tidak dapat dicapai tanpa sistem komunikasi yang berkesan. Kajian ini menyimpulkan bahawa terdapat

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perkaitan signifikan antara ketiga-tiga tema utama, di mana kegagalan menanganinya boleh merencatkan potensi produktiviti sebenar pekerja.

Kata Kunci: Keterbatasan komunikasi, pekerja asing, PRISMA, produktiviti, tinjauan literatur sistematik

The Impact of Communication Limitations on the Effectiveness of Foreign Workers' Productivity: A Systematic Literature Review

ABSTRACT

The productivity of foreign workers is a key indicator that determines the efficiency of an organisation in achieving its set production targets. Although foreign workers contribute significantly to national output, issues related to communication gaps and cultural adaptation often become major challengers in maintaning the quality of their work. This study aims to systematically examine research methods on variables that influence the productivity of foreign workers in an organisation. The literature review was applied by following the Preferred Reporting Items for Systematic Reviews and Meta Analyses (PRISMA) 2020 guidelines. The four PRISMA levels, namely identification, screening, qualification and inclusion, were used to systematically evaluate the literature review. The period of studies eligible for review was published within a 5-years period, from 2020 to 2025 and the review was carried out using two of the most reputable databases, Scopus and Google Scholar. Out of 1185 articles identified, only 17 articles were selected because they met the set criteria. A review of the selected articles found that productivity in an organisation is affected by three main themes, namely language barriers and communication limitations, safety and health of foreign workers, and an unconducive work environment. All articles discussed language barriers and communication limitations as the main causes that affect the productivity of foreign workers. Therefore, this literature review emphasises that sustainable productivity cannot be achieved without an effective communication system. This study finds a significant relationship between the three main themes, where failure to address them can limit employee productivity.

Keywords: *Communication limitations, foreign workers, PRISMA, productivity, systematic literature review*

PENGENALAN

Produktiviti pekerja asing di sektor pekerjaan merupakan salah satu aspek penting yang menentukan keberkesanan operasi sesebuah organisasi. Produktiviti kerja didefinisikan sebagai kecekapan pekerja melakukan tugas mereka dalam mencapai matlamat kerja yang diberikan dengan kos minimum (Hanaysha, 2016; Mohd Salleh et al., 2021). Pekerja merupakan individu yang mengerahkan tenaga dan idea bagi membantu mencapai matlamat, visi dan misi bagi sesebuah organisasi (Deraman & Mohd Isa, 2016). Kemasukan pekerja asing ke dalam negara bukan sahaja dapat memenuhi kekosongan tenaga kerja, malah membantu dalam meningkatkan ekonomi negara. Menurut Aimi Zulhazmi Abdul Rashid dalam keratan

akhbar Utusan Malaysia (2022), kemasukan pekerja asing penting untuk menampung keperluan industri-industri yang menggunakan tenaga buruh murah seperti di sektor perladangan dan perkilangan. Hal ini demikian kerana, kebanyakan sektor ekonomi di negara ini memerlukan tenaga buruh yang murah, lasak, berbahaya dan mampu bekerja untuk jangka masa yang panjang. Peningkatan terhadap produktiviti pekerja akan memberi kelebihan kepada majikan, pengguna dan negara (Ismail et al., 2020). Walaupun pekerja asing dianggap sebagai penyumbang kepada kelangsungan operasi dan pengeluaran, persoalannya sejauh mana mereka mencapai tahap produktiviti yang optimum masih menjadi tanda tanya. Tanpa pekerja tempatan mahu pun pekerja asing, sesebuah organisasi tidak mampu melaksanakan fungsi dan tanggungjawabnya secara efektif dalam memastikan kelangsungan operasi harian.

Dalam konteks organisasi yang bergantung kepada tenaga kerja asing, tahap produktiviti sering dikaitkan dengan kebolehan komunikasi antara pekerja (Mohd Salleh et. al., 2021; Ne'Matullah et al., 2021; Nahartini et al., 2021). Halangan komunikasi dan perbezaan bahasa bukan sahaja memberi kesan terhadap keberkesanan penyampaian maklumat, tetapi turut mempengaruhi prestasi kerja serta hubungan sosial di tempat kerja. Masalah produktiviti sering berlaku di sektor pembinaan kerana sektor ini mengalami kadar kelewatan yang tinggi, kualiti yang tidak memuaskan, isu kesihatan dan keselamatan, pencemaran dan isu kemampanan disebabkan oleh amalan komunikasi yang tidak berkesan (Olanrewaju et al., 2017). Secara keseluruhan, produktiviti kerja di tapak pembinaan bergantung kepada komunikasi yang berkesan di kalangan pekerja, pihak kontraktor, klien, perunding, dan pembekal. Antara faktor utama yang dikenal pasti termasuklah kelemahan dalam perancangan dan pengurusan tapak, kekurangan pengalaman kontraktor, masalah kewangan serta kelewatan bayaran oleh klien, kekurangan bahan dan tenaga kerja, serta kegagalan peralatan (Ali et al., 2010; Memon et al., 2011; Sambasivan & Soon, 2007; Ye & Abdul Rahman, 2010). Selain itu, isu komunikasi yang tidak berkesan antara pihak terlibat turut menyumbang kepada kelewatan projek, kesilapan semasa pembinaan, dan peningkatan kos (Ali et al., 2010; Eko Bariano & Kamaruding, 2025; Ghani et al., 2022; Ne'Matullah et al., 2021; Othman et al., 2006; Tan & Abdul Rahman, 2011). Oleh itu, kelemahan dalam pengurusan, komunikasi, kewangan, dan perancangan projek merupakan penyumbang utama kepada penurunan produktiviti dalam sektor pembinaan.

Kepentingan produktiviti pekerja asing dalam sesebuah organisasi dan ekonomi negara tidak dapat disangkal lagi, terutamanya dalam memastikan kelangsungan operasi sektor-sektor kritikal. Produktiviti yang tinggi daripada tenaga kerja asing menyumbang secara langsung kepada peningkatan Keluaran Dalam Negara Kasar (KDNK) melalui hasil pengeluaran yang konsinten dalam industri seperti sektor perkilangan, pembinaan, perkhidmatan dan perladangan. Bagi sesebuah organisasi,

kecekapan pekerja asing merupakan kunci kepada daya saing pasaran. Hal ini demikian kerana, tahap output yang optimum membolehkan organisasi meminimumkan kos unit pengeluaran dan memenuhi permintaan pelanggan tepat pada waktunya. Selain itu, produktiviti pekerja asing juga berperanan sebagai pemangkin kepada kestabilan rantaian bekalan, di mana penglibatan mereka dalam pekerjaan yang sering dijauhi oleh tenaga kerja tempatan dengan memastikan tiada lompang operasi yang boleh melumpuhkan produktiviti sesebuah industri secara keseluruhan. Maka, produktiviti pekerja asing bukan sekadar pengisian tenaga kerja, malah merupakan pemacu pertumbuhan ekonomi yang menjamin kelestarian perniagaan dalam jangka masa panjang. Walaupun kepentingannya semakin diiktiraf, bukti empirikal berkaitan produktiviti pekerja asing masih belum disepadukan secara menyeluruh, sekali gus menghadkan pemahaman terhadap faktor-faktor yang mempengaruhi produktiviti mereka. Oleh itu, tinjauan literatur sistematik ini dijalankan untuk mengisi jurang pengetahuan tersebut serta menyediakan asas yang lebih kukuh bagi penyelidikan dan amalan pada masa hadapan.

Persoalan kajian merupakan penanda aras yang bakal memandu tinjauan literatur sistematik ini. Maka, persoalan kajian yang dibentuk adalah (i) apakah kaedah metodologi yang digunakan dalam kajian dari tahun 2020 hingga 2025? dan (ii) apakah faktor-faktor yang mempengaruhi penurunan produktiviti dalam kalangan pekerja asing?

METODOLOGI KAJIAN

Kajian ini menggunakan *Preferred Reporting Items for Systematic Reviews and Meta-Analyses* (PRISMA) (Page et al., 2021) bagi meneliti setiap sorotan kajian berkaitan dengan halangan komunikasi pekerja asing di sektor pekerjaan. Tinjaun literatur sistematik merupakan satu pendekatan saintifik yang berstruktur untuk menjawab soalan yang dirumuskan dengan jelas. Menurut Shaffril et al. (2021), protokol ini dapat menjadi pedoman untuk sorotan literatur bersistematik dalam bidang yang melibatkan penilaian dan pencampuran elemen tertentu. Dari sudut kebolehlaksanaan kaedah yang digunakan, kajian ini menunjukkan keselarasan dengan pendekatan yang digunakan dalam ulasan sistematik terdahulu dalam bidang Linguistik Aplikasi (Kaushik et al., 2016; Nissi et al., 2021; Putri, 2022; Zhong et al., 2023).

Persoalan kajian berikut terdiri daripada format *Population/Problem, Interest, Context* (PICo), iaitu P=Pekerja asing, I=Keterbatasan komunikasi dan Co=Sektor pekerjaan. Ia melibatkan penggunaan kaedah yang sistematik dan eskplisit dalam mengenal pasti, memilih, menilai secara kritikal serta menganalisis data daripada kajian-kajian yang relevan untuk memastikan kebolehpercayaan dan ketepatan dapatan (Moher et al., 2010). Terdapat empat proses strategi pencarian sistematik iaitu, pengenalpastian *(identification)*, saringan *(screening)*, kelayakan *(eligibility)* dan rangkuman *(included)*. Keempat-empat proses ini akan dihuraikan pada bahagian subtopik dibawah.

Pengenalpastian

Pencarian kata kunci yang bersesuaian berdasarkan persoalan kajian merupakan proses awal dalam mengenal pasti istilah dan konsep utama yang berkaitan dengan topik penyelidikan. Berdasarkan format PICo, penyelidik memilih tiga kata kunci utama iaitu pekerja asing, keterbatasan komunikasi dan sektor pekerjaan. Jadual 1 memaparkan kata kunci pencarian untuk mendapatkan artikel yang berkaitan. Bagi meningkatkan kemungkinan memperoleh lebih banyak artikel untuk semakan, penyelidik mencari sinonim, istilah dan variasi kata yang berkaitan dalam penyelidikan ini.

Dua pangkalan data telah dipilih untuk pencarian tinjauan literatur sistematik iaitu Scopus dan Google Scholar. Pangkalan data ini menawarkan akses langganan kepada pangkalan data lain dan mempunyai pelbagai kategori bidang akademik. Kajian ini memanfaatkan pangkalan data Scopus yang diiktiraf sebagai sumber utama dan mengandungi pelbagai penerbitan ilmiah yang disemak oleh proses penilai semula *(peer-review process)* daripada pelbagai bidang penyelidikan (Duman et al., 2015; Putri, 2022). Menurut Gusenbauer dan Haddaway (2020), Scopus merupakan salah satu daripada 14 pangkalan data utama dalam pencarian artikel dan menyenaraikan jurnal dan artikel berimpak tinggi selain pangkalan Web of Science (WoS) dan Science Direct. Manakala, pangkalan data Google Scholar dipilih kerana ia mempunyai liputan yang lebih luas terhadap kajian tempatan dari institusi pengajian tinggi di Malaysia yang tidak semestinya tersenarai dalam pangkalan data berindeks seperti Scopus atau WoS. Selain itu, akses terbuka dan keupayaannya mengindeks pelbagai penerbit membantuk memastikan proses pencarian literatur menjadi lebih menyeluruh serta mengurangkan kemungkinan terlepas kajian yang relevan dengan objektif kajian.

Jadual 1
Kata kunci pencarian tinjauan literatur sistematik

Bil.	Pangkalan Data	Kata Kunci
1	Scopus	TITLE-ABS-KEY (("communication barrier*" OR "language barrier*" OR "communication challenge*" OR "language challenge*" OR "communication difficulty" OR "language difficulty" OR "communication obstacle*" OR "linguistic barrier*") AND ("foreign worker*" OR "migrant worker*" OR "non-native worker*" OR "labor migrant*" OR "labour migrant*") AND ("workplace" OR "organisation*" OR "employment setting*" OR "job setting*" OR "work environment") AND ("productivity" OR "work performance" OR "job performance" OR "efficiency" OR "output" OR "work outcome*" OR "employee performance"))
2	Google Scholar	(("communication barrier*" OR "language barrier*" OR "communication challenge*" OR "language challenge*" OR "communication difficulty" OR "language difficulty" OR "linguistic barrier*") AND ("foreign worker*" OR "migrant worker*") AND ("workplace" OR "organisation*") AND ("productivity" OR "work performance" OR "job performance"))

Sumber: Hasil dapatan penulis

Sehubungan itu, tinjauan literatur sistematik ini merangkumi kajian yang relevan dengan konteks Malaysia.

Pangkalan data Web of Science (WoS) dan Science Direct tidak dipilih sebagai sumber utama dalam kajian ini kerana liputan penerbitannya lebih tertumpu kepada bidang sains, teknologi dan perubatan. Walaupun WoS dan Science Direct mengandungi beberapa kajian berkaitan pekerja asing, kebanyakannya membincangkan aspek saintifik. Sebalikua, kajian ini lebih memfokuskan aspek bahasa yang berkaitan dengan pekerja asing. Oleh itu, WoS didapati mempunyai bilangan artikel yang berkaitan dengan fokus kajian yang lebih terhad berbanding Scopus dan Google Scholar yang menawarkan liputan literatur yang lebih luas merangkumi pelbagai disiplin termasuk bahasa dan linguistik.

Saringan

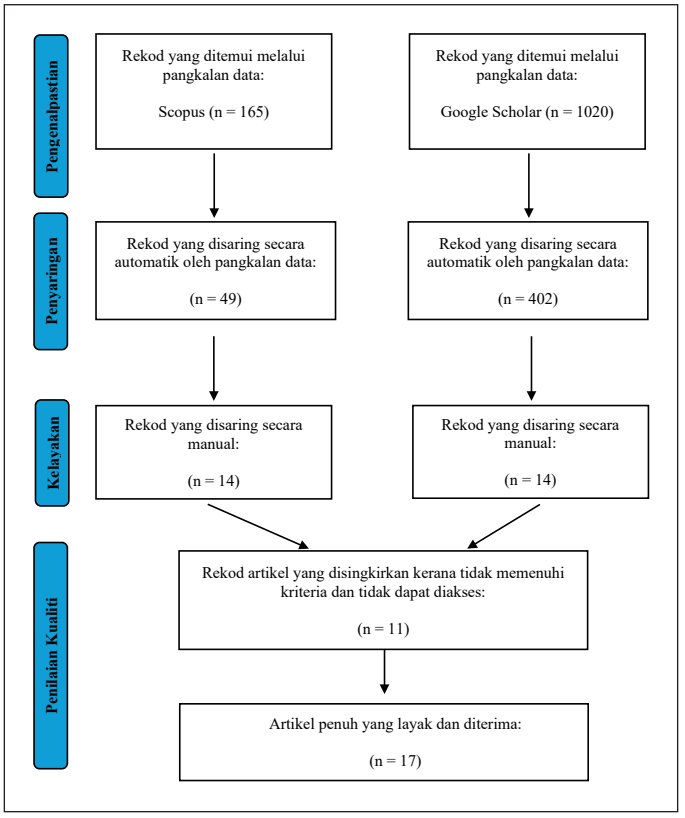
Saringan merupakan langkah kedua dalam strategi carian sistematik, di mana sebanyak 165 artikel daripada Scopus dan 1020 artikel daripada Google Scholar telah diteliti untuk dimasukkan dalam semakan. Kriteria pertama adalah tempoh masa penerbitan iaitu dari tahun 2020 hingga 2025. Seterusnya, jenis literatur selain daripada jurnal, artikel, prosiding dan persidangan tidak dimasukkan untuk dianalisis. Sampel kajian terdiri dalam kalangan pekerja asing sahaja dan selain daripada kategori pekerja asing juga ditolak untuk dianalisis. Hal ini demikian kerana, isu komunikasi sering berlaku dalam kalangan pekerja asing yang menjadi fokus sampel kajian di sektor pekerjaan, terutamanya disebabkan oleh perbezaan bahasa yang ketara. Sehubungan itu, pematuhan terhadap kriteria yang ketat seperti yang disarankan oleh Rose et al. (2018) membantu memastikan kajian ini bebas daripada bias malah dapat meningkatkan tahap kebolehpercayaan serta nilai keseluruhan dapatan dan cadangannya.

Jadual 2 merupakan kriteria penerimaan dan penolakan. Berdasarkan tapisan automatik yang dilakukan pangkalan data Scopus, dengan menetapkan kriteria seperti tempoh masa penerbitan, jenis literatur dan kategori pekerja, sebanyak 49 artikel telah dikenal pasti. Manakala, tapisan automatik bagi pangkalan data Google Scholar memaparkan 402 artikel yang telah diperoleh. Kemudian, jumlah artikel yang layak akan dipaparkan oleh pengkaji melalui penilaian terhadap kualiti artikel seperti yang dinyatakan di Rajah 1.

Jadual 2
Kriteria penerimaan dan penolakan

Bil.	Kriteria	Penerimaan	Penolakan
1	Tempoh masa	2020-2025	< 2020 ke bawah
2	Jenis literatur	Jurnal dan artikel	Buku, bab dalam buku dan jurnal (tinjauan sistematik), prosiding, tesis, disertasi dan persidangan
3	Kategori pekerja	Pekerja asing	Selain pekerja asing

Sumber: Hasil dapatan penulis



Rajah 1. Gambar rajah alir untuk pencarian pangkalan data dan mendapatkan penerbitan untuk semakan sistematik
Sumber: Diubah suai daripada Moher et al. (2010)

Kelayakan

Langkah ketiga adalah kelayakan, yang melibatkan penyemakan semula secara kendiri setiap artikel yang diambil untuk memastikan ia memenuhi keperluan berikutan proses penyaringan. Penyemakan semula secara kendiri dilakukan apabila pengkaji membaca tajuk dan abstrak kertas yang disediakan untuk melengkapkan prosedur ini. Sebanyak 423 artikel telah ditolak kerana tidak mencapai kriteria yang diinginkan semasa pembacaan tajuk dan keseluruhan abstrak. Oleh itu, pada peringkat ini berbaki hanya 14 artikel sahaja untuk dianalisis bagi kedua-dua pangkalan data. Walau bagaimanapun, sebanyak 11 buah artikel telah dikeluarkan daripada proses saringan akhir setelah penelitian menyeluruh dilakukan. Penyingkiran ini dibuat kerana artikel-artikel tersebut tidak memenuhi kriteria yang ditetapkan, merangkumi penerbitan dalam bentuk tesis, disertasi, dan prosiding, serta terdapat kekangan akses bagi mendapatkan teks lengkap artikel tersebut. Bagi memastikan bahan kajian berkualiti tinggi, artikel

yang layak telah diserahkan kepada dua profesional untuk semakan kualiti. Hal ini demikian kerana, saranan penyemakan artikel perlulah sekurang-kurangnya dua orang penilai berdasarkan tema yang telah dipersetujui (Petticrew & Roberts, 2006; Shaffril et al., 2021). Kedua-dua penilai terdiri daripada kumpulan penyelidik kerana mereka mempunyai kepakaran yang relevan dalam bidang sosiolinguistik. Justeru, penglibatan mereka membantu memastikan penilaian kualiti dijalankan secara konsisten, sistematik dan selaras dengan protokol kajian yang telah ditetapkan.

HASIL DAN PERBINCANGAN

Latar Belakang Artikel yang Diterima

Sebanyak 17 artikel penuh telah dikenal pasti iaitu sembilan daripada pangkalan data Scopus dan 8 daripada pangkalan data Google Scholar. 17 artikel yang disaring ini memenuhi kriteria yang telah ditetapkan dan layak untuk dianalisis dalam perbincangan kajian ini. Kajian-kajian ini memfokuskan kepada halangan komunikasi di kalangan pekerja asing yang mempengaruhi produktiviti di tempat kerja.

Rajah 2 memaparkan jumlah artikel bagi lima tahun kebelakangan, bermula pada tahun 2020 hingga 2025. Analisis trend penerbitan menunjukkan bahawa tahun 2021 mencatatkan bilangan penerbitan tertinggi bagi kajian berkaitan halangan komunikasi dalam kalangan pekerja asing, iaitu sebanyak enam artikel (Aznan & Ishak, 2021; Basalamah et al., 2021; Mattila et al., 2021; Mohd Salleh et al., 2021; Ne'Matullah, 2021; Yap & Ahmad, 2021). Pada tahun 2022 hanya satu artikel diterbitkan iaitu kajian oleh Rehman dan Ishak (2022) diikuti dua kajian oleh Fellows et al. (2023) dan Rotimi et al. (2023) pada tahun 2023. Walau bagaimanapun, jumlah tersebut menunjukkan peningkatan pada tahun 2024 dengan tiga artikel (Dzawanda et al., 2024; Goh et al., 2024; Kuoriba et al., 2024) dan terus meningkat pada tahun 2025 kepada lima artikel (Alruwaili et al., 2025; Bariono & Kamaruding, 2025; Maung & Siriwato, 2025; Olanrewaju et al., 2025; Salombe et al., 2025). Secara keseluruhannya, trend penerbitan memperlihatkan peningkatan berterusan dari tahun 2022 hingga 2025.



Rajah 2. Latar belakang artikel yang diterima
Sumber: Hasil dapatan penulis

Kaedah Metodologi Kajian Literatur

Hasil tinjauan mendapati bahawa rata-rata kajian terdahulu cenderung menggunakan pendekatan kuantitatif sebagai kaedah utama penyelidikan. Sebanyak lapan artikel menggunakan pendekatan kuantitatif dengan instrumen pengumpulan data berupa soal selidik (Aznan & Ishak, 2021; Kuoriba et al., 2024; Mohd Salleh et al., 2021; Ne'Matullah, 2021; Olanrewaju et al., 2025; Rehman & Ishak, 2022; Rotimi et al., 2023; Yap & Ahmad, 2021). Manakala, sebanyak enam artikel yang menggunakan kaedah kualitatif dengan menggunakan instrumen kajian berupa temu bual, pemerhatian dan perspektif individu (Alruwaili et al., 2025; Basalamah et al., 2021; Fellows et al., 2023; Maung & Siriwato, 2025; Mattila et al., 2021; Salombe et al., 2025). Seterusnya, tiga artikel yang menggunakan pendekatan campuran (Bariono & Kamaruding, 2025; Dzawanda et al., 2024; Goh et al., 2024). Oleh itu, kaedah metodologi kajian literatur yang telah diterbitkan dari tahun 2021 hingga 2025 menggunakan pendekatan kuantitatif diikuti dengan pendekatan kualitatif dan seterusnya pendekatan campuran.

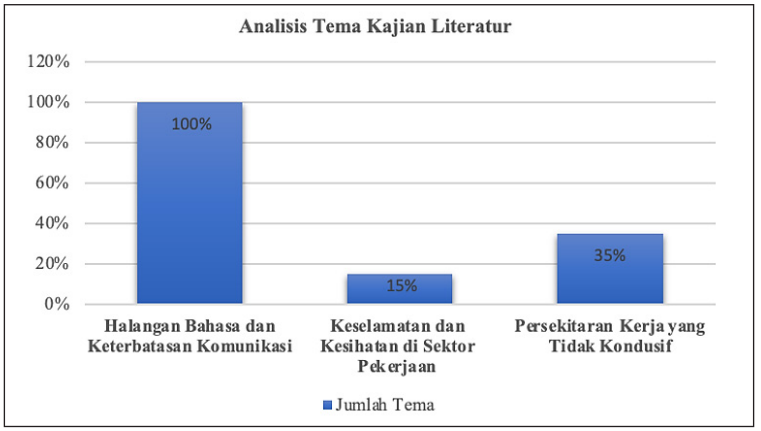
Analisis Tema Kajian Literatur

Persoalan kajian ini tertumpu kepada faktor-faktor yang mempengaruhi penurunan produktiviti dalam kalangan pekerja asing di sektor pekerjaan. Hasil dapatan daripada artikel yang layak diterima mempunyai tiga tema utama untuk dianalisis dan dibincangkan. Faktor-faktor yang mengganggu produktiviti di sektor pekerjaan telah diklasifikasikan kepada tiga tema utama iaitu: i) Halangan Bahasa dan Keterbatasan Komunikasi, ii) Kesihatan dan Keselamatan di Sektor Pekerjaan dan iii) Persekitaran Kerja yang Tidak Kondusif. Walaupun ketiga-tiga tema ini sering dibincangkan dalam literatur, kebanyakan kajian menelitinya secara berasingan mengikut konteks dan sektor tertentu. Oleh itu, perbincangan ini bukan sahaja mensintesis dapatan bagi setiap tema, malah menjelaskan hubung kait antara tema-tema tersebut dalam mempengaruhi produktiviti pekerja asing.

Rajah 3 memaparkan pecahan peratusan bagi artikel yang dikategorikan kepada tiga tema utama. Kesemua 17 buah artikel (1005) membincangkan tentang halangan bahasa dan keterbatasan komunikasi pekerja asing. Selain itu, 12 daripada 17 artikel (35%) turut membincangkan isu persekitaran kerja yang tidak kondusif, manakala 5 buah artikel (15%) juga menyentuh aspek kesihatan dan keselamatan di sektor pekerjaan. Dapatan ini menunjukkan bahawa terdapat pertindihan tema, di mana beberapa artikel membincangkan lebih daripada satu isu dalam kajian.

Halangan Bahasa Dan Keterbatasan Komunikasi

Halangan bahasa merupakan antara isu utama yang sering dihadapi oleh pekerja asing di sektor pekerjaan, khususnya dalam konteks persekitaran kerja yang bersifat multibahasa.



Rajah 3. Pecahan peratusan bagi artikel yang dikategorikan mengikut tema
Sumber: Hasil dapatan penulis

Perbezaan latar belakang linguistik antara pekerja asing dan pihak majikan, rakan sekerja serta pelanggan berpotensi menjejaskan keberkesanan komunikasi harian. Pekerja yang tidak menguasai bahasa lazimnya berkomunikasi menggunakan isyarat ketika menjalankan tugas (Fellows et al., 2023). Keadaan ini menyebabkan penyampaian mesej menjadi kurang jelas, manakala penerima pula berisiko untuk salah faham, terlupa atau tidak mengendahkan maklumat yang disampaikan walaupun penjelasan telah diberikan dengan baik. Akibatnya, keberkesanan komunikasi di tempat kerja terjejas (Mohd Salleh et al., 2021).

Hasil tinjauan mendapati bahawa kesemua literatur lepas membincangkan halangan bahasa sebagai punca utama yang mempengaruhi produktiviti di tempat kerja. Menurut Bariono dan Kamaruding (2025), halangan bahasa merupakan isu yang ketara dan bermasalah yang berlaku di kalangan pekerja asing. Selaras dengan dapatan Ismail et al. (2020), halangan bahasa turut dikenal pasti sebagai kekangan yang ketara dalam kalangan buruh asing, khususnya dalam sektor pembinaan di Malaysia. Hal ini demikian kerana, sesetengah pekerja asing menghadapi kesukaran untuk memahami sepenuhnya arahan teknikal atau protokol keselamatan kerana mempunyai kemahiran bahasa yang rendah (Bariono & Kamaruding, 2025; Kuoribo et al., 2024). Keadaan ini boleh membawa kepada salah faham dan keterbatasan komunikasi, sekali gus menjejaskan tahap produktiviti dan keselamatan di tempat kerja (Alruwaili et al., 2025; Bariono & Kamaruding, 2025; Mohd Salleh et al., 2021; Ne'Matullah, 2021; Yap & Ahmad, 2021). Tambahan pula, halangan komunikasi berlaku disebabkan oleh halangan bahasa. Perbezaan dua bahasa di tempat kerja telah mengganggu pekerjaan seharian terutamanya apabila majikan perlu mengendalikan pekerja asing. Dapatan daripada kajian Dzawanda et al.

(2024) menyatakan bahawa terdapat lebih daripada lima bahasa yang digunakan di tapak pembinaan seperti bahasa Inggeris, bahasa Shona, bahasa Ndebele, bahasa Cina, bahasa Tonga dan bahasa Nambya. Hal ini menggambarkan pekerja asing kurang keyakinan dalam komunikasi, kurang pengetahuan dan pengurusan masa yang lemah dalam melaksanakan tugas yang diberikan dalam bahasa yang diperlukan. Bahkan, majikan juga gagal menyampaikan maklumat kepada pekerja asing dan menyebabkan mereka melakukan kesilapan semasa menyiapkan tugasan (Goh et al., 2024; Dzawanda et al., 2024). Kesan daripada halangan komunikasi ini telah melambatkan penyiapan projek, membawa kepada pembaziran bahan dan sumber, kelewatan dalam penghantaran kerja dan pengulangan kerja terpaksa dilakukan untuk mencapai standard yang diperlukan (Goh et al., 2024; Ismail et al., 2020; Ne'Matullah, 2021).

Terdapat tiga kajian (Basalamah et al., 2021; Maung & Siriwato, 2025; Salombe et al., 2025) yang membincangkan tentang halangan bahasa pekerja asing yang bekerja di Jepun. Majoriti bakal pekerja tanpa pengalaman kerja terdahulu di Jepun perlu menjalani latihan bahasa Jepun seperti yang ditetapkan dalam *Technical Intern Training Act* (TITP) berkaitan pemerolehan dan penguasaan bahasa pekerja. Hal ini demikian kerana, kerajaan telah menetapkan dengan jelas bahawa kewajipan berbahasa Jepun untuk pekerja supaya pekerjaan dapat berjalan degan lancar tanpa halangan (*Ministry of Health, Labour and Welfare*, 2025). Walaupun latihan bahasa telah diberikan, pekerja masih menghadapi kesukaran untuk berkomunikasi secara berkesan akibat ketidakpadanan antara bahasa formal yang dipelajari dengan tuntutan komunikasi sebenar di tempat kerja (Basalamah et al., 2021) serta pengaruh penggunaan dialek tempatan (Salombe et al., 2025). Berdasarkan kajian (Salombe et al., 2025) penggunaan dialek tempatan telah menjadi halangan utama dalam pemahaman bahasa Jepun dalam kalangan pekerja. Dialek bahasa Jepun merujuk kepada variasi linguistik mengikut wilayah yang berbeza daripada bahasa Jepun standard termasuklah aksen, fonologi (sebutan), morfologi (struktur perkataan) dan leksikon (kosa kata). Walaupun perbezaan aksen dan sebutan lazimnya tidak menjejaskan komunikasi secara signifikan, namun variasi dalam morfologi dan kosa kata didapati memberi kesan besar terhadap kefahaman penutur asing. Isu ini juga berlaku dalam kalangan pekerja Myanmar yang menghadapi kesukaran untuk memahami arahan kerja disebabkan oleh penggunaan istilah khusus dan jargon teknikal semasa bekerja (Maung & Siriwato, 2025). Walaupun kesemua pekerja telah mencapai tahap penguasaan bahasa Jepun N-3, mereka masih menghadapi kesukaran untuk menyesuaikan diri sama ada di tempat kerja mahupun dalam kehidupan seharian. Manakala, kajian Basalamah et al. (2021), pekerja dikehendaki untuk menguasai bahasa formal, selaras dengan budaya kerja dan norma profesional

masyarakat Jepun di sektor perhotelan. Hal ini demikian kerana, komunikasi formal lebih diperlukan dan penting dalam komunikasi bertulis berbanding komunikasi lisan, memandangkan kebanyakan pelancong mampu bertutur dalam bahasa Inggeris. Sehubungan dengan itu, penguasaan terhad dalam bahasa Jepun telah menyebabkan pekerja cenderung untuk mengelak daripada bertanya dan tidak memberi sebarang maklum balas dengan rakan sekerja (Basalamah et al., 2021; Salombe et al., 2025). Tanpa sokongan komunikasi yang mencukupi, keadaan ini boleh meningkatkan kebimbangan semasa berkomunikasi serta menurunkan motivasi kerja. Kesannya, kesejahteraan mental pekerja terjejas dan produktiviti serta kepuasan kerja turut menurun.

Kesihatan dan Keselamatan Pekerja Asing

Kesihatan dan keselamatan pekerja asing di tempat kerja merupakan aspek penting yang perlu diberi perhatian bagi memastikan persekitaran kerja yang selamat dan bebas daripada risiko kemalangan. Walau bagaimanapun, pekerja asing kerap terdedah dengan bahaya kerana tidak menerima latihan keselamatan yang sewajarnya. Berdasarkan kajian Goh et al. (2024), kelima-lima responden memberi kenyataan bahawa ketiadaan maklumat tentang kesihatan dan keselamatan serta kegagalan majikan menyediakan peralatan keselamatan di tempat kerja. Bahkan, kemalangan berlaku disebabkan oleh keterbatasan bahasa pekerja asing di tempat kerja. Hal ini demikian kerana, pekerja asing lebih rela meminta bantuan daripada majikan atau rakan sekerja berbanding menghubungi nombor kecemasan jika berlakunya kemalangan (Mattila et al., 2021). Sesetengah pekerja mengelak untuk mendapatkan rawatan di pusat kesihatan disebabkan oleh masalah bahasa dan kekurangan maklumat untuk melalui proses mendapatkan perubatan. Tambahan pula, majoriti responden mendedahkan ketidakselesaan dalam menangani kebimbangan keselamatan kepada majikan mereka kerana bimbang akan tindak balas daripada pihak atasan dan mereka takut untuk melaporkan kemalangan kerana takut dibuang kerja (Dzawanda et al., 2024). Kekurangan latihan keselamatan yang formal berada pada kedudukan ketiga dalam faktor yang dikenal pasti, menunjukkan kelemahan dalam penyediaan pengetahuan dan kemahiran keselamatan, seterusnya meningkatkan risiko kemalangan di tempat kerja.

Berdasarkan kajian daripada Alruwaili et al. (2025), keutamaan kesihatan diberikan kepada kesihatan mental berbanding kesihatan dan keselamatan fizikal di tempat kerja. Secara umumnya, kesihatan mental merangkumi kesejahteraan emosi, fisiologi dan sosial seseorang. Tanpa kesihatan mental yang kukuh, ia akan mempengaruhi kehidupan peribadi atau pekerjaan pekerja. Pekerja boleh membahayakan diri mereka sendiri atau orang lain dengan melakukan tindakan yang tidak selamat dan berisiko. Hal ini demikian kerana, ketiadaan sokongan keluarga berdekatan,

kekurangan hubungan bersama keluarga telah meningkatkan risiko tekanan mental (Mattila et al., 2021). Walau bagaimanapun, stigma negatif terhadap kesihatan mental masih berterusan dan menghalang pelaksanaan pembangunan serta intervensi yang berkesan di tempat kerja. Sehubungan dengan itu, pekerja asing memilih untuk tidak berkongsi tentang kesihatan mental kerana ia bukan satu keutamaan penting dalam budaya mereka. Mereka enggan untuk mendapatkan bantuan dan menganggap masalah kesihatan mental sebagai kelemahan peribadi atau sesuatu yang memalukan. Hasil dapatan informan mengatakan bahawa latihan kesihatan dan keselamatan diberikan berkaitan pengendalian peralatan dan kesedaran bahaya. Namun, tiada latihan mengenai kesihatan mental dalam organisasi mereka. Pekerja asing menghadapi halangan yang lebih besar disebabkan oleh pantang larang budaya, isu bahasa dan akses terhadap sokongan. Kesimpulannya, pembinaan persekitaran organisasi yang menyokong peningkatan kemahiran komunikasi berkesan dalam kalangan pekerja terbukti dapat mengurangkan kejadian risiko serta meningkatkan tahap keselamatan dan kecekapan kerja (Rehman & Ishak, 2022).

Persekitaran Kerja yang Tidak Kondusif

Persekitaran kerja yang tidak kondusif merupakan salah satu faktor utama yang mengganggu tahap produktiviti pekerja dalam sesebuah organisasi. Sebanyak 12 buah artikel yang membincangkan tentang persekitaran kerja dalam kajian yang mempengaruhi kualiti kerja di sesebuah organisasi (Aznan & Ishak, 2021; Bariono & Kamaruding, 2025; Dzawanda et al., 2024; Goh et al., 2024; Kuoribo et al., 2024; Maung & Siriwato, 2025; Mattila et al., 2021; Mohd Salleh et al., 2021; Ne'Matullah, 2021; Rehman & Ishak, 2022; Rotimi et al., 2023; Yap & Ahmad, 2021).

Persekitaran kerja yang tidak kondusif dapat dilihat apabila kerjasama dalam berpasukan adalah lemah (Rehman & Ishak, 2022), khususnya dalam sektor pekerjaan yang berbilang budaya (Kuoribo et al., 2024). Perbezaan latar belakang budaya dan gaya komunikasi sering menyebabkan kelewatan dalam proses membuat keputusan, kekerapan perubahan reka bentuk, kekurangan sumber, salah faham dan seterusnya menjejaskan tahap produktiviti (Rehman & Ishak, 2022). Selain itu, kajian Kuoribo et al. (2024) menyatakan tentang amalan menyalahkan pihak lain yang dipanggil sebagai *"scapegoatism"*, telah disenaraikan sebagai kesan ketiga tertinggi yang turut memburukkan suasana kerja apabila pekerja dipersalahkan atas kesilapan yang berlaku berbanding berusaha dalam mencari penyelesaian secara kolektif dan konstruktif. Perkara ini dapat dilihat bahawa diskriminasi berlaku dan memberi kesan negatif terhadap produktiviti serta kesejahteraan pekerja. Hasil dapatan kajian Mohd Salleh et al. (2021) memaparkan pemboleh ubah diskriminasi menunjukkan hubungan positif yang kuat terhadap

produktiviti kerja. Pekerja asing sering didiskriminasikan oleh majikan tempatan yang menyebabkan pekerja asing melalui tekanan, penurunan kepuasan, komitmen dan tingkah laku yang tidak memuaskan (Shah & Yusof, 2018).

Berdasarkan kajian Dzawanda et al. (2024), majoriti responden (53%) menyatakan bahawa tekanan kerja yang tinggi telah dikenal pasti sebagai punca utama kelemahan komunikasi dan tahap keterlibatan pekerja yang rendah dalam aspek keselamatan. Dapatan ini selari dengan kajian Mattila et al. (2021) bahawa tekanan kerja memberi kesan terhadap fizikal pekerja, terutamanya apabila tarikh akhir projek semakin hampir. Selain itu, waktu bekerja yang tidak tetap turut menyumbang kepada kelewatan penyiapan sesuatu projek (Bariono & Kamaruding, 2025; Goh et al., 2024; Ne'Matullah 2021). Beban kerja fizikal yang berat, tugasan berulang serta kedudukan kerja yang menyukarkan juga menjadikan sektor pertanian dan hortikultur sangat mencabar (Mattila et al., 2021). Kestabilan komuniti pekerja di ladang sering terjejas akibat kadar penggantian kerja yang tinggi, di mana terdapat pekerja dan penyelia yang hanya kekal untuk satu musim sahaja (Mattila et al., 2021). Fenomena pertukaran kerja dan penyelia ini didapati mewujudkan suasana kerja yang tegang, terutamanya apabila wujud halangan bahasa dan silang budaya.

Kekurangan tenaga kerja turut menjadi faktor kritikal yang menjejaskan produktiviti sesebuah organisasi. Hal ini berpunca daripada proses permohonan pengambilan pekerja asing yang bersifat birokratik, panjang dan rumit (Aznan & Ishak, 2021; Maung & Siriwato, 2025). Majoriti pekerja yang diambil bekerja terdiri daripada buruh kurang mahir yang tidak mempunyai latihan atau pengalaman mencukupi sekali gus membawa kepada ketidakcekapan dan risiko kelewatan projek (Dzawanda et al., 2024; Yap & Ahmad, 2021). Kekurangan pengalaman ini bukan sahaja menjejaskan kualiti kerja, malah mewujudkan kebergantungan yang tinggi terhadap penyeliaan majikan (Bariono & Kamaruding, 2025). Oleh itu, elemen imbuhan, peluang kemajuan pengetahuan dan perkembangan kerjaya amat penting dalam mempengaruhi kepuasan kerja (Rotimi et al., 2023). Jadual 3 memaparkan ringkasan hasil kajian yang layak diterima dalam sorotan literatur.

KESIMPULAN

Tinjauan literatur bersistematik ini meninjau kajian-kajian lepas yang terpilih tentang faktor-faktor yang mempengaruhi produktiviti sesebuah organisasi, khususnya dalam kalangan pekerja asing. Berdasarkan sejumlah 17 artikel yang dianalisis, halangan bahasa merupakan faktor utama yang mengganggu produktiviti kerja dan menyumbang kepada tahap penglibatan pekerja yang rendah, serta faktor lain seperti tekanan atau beban kerja, kekurangan latihan, halangan budaya dan ketakutan dalam melaporkan sebarang kemalangan.

Jadual 3
Ringkasan hasil kajian yang layak diterima dalam sorotan literatur

Penulis	Kaedah Metodologi	Instrumen Kajian	Tema	Kesan Keterbatasan Komunikasi
Ne'Matullah (2021)	Kuantitatif	Soal selidik	Halangan bahasa dan keterbatasan komunikasi	Kajian ini mendapati halangan bahasa memberi kesan kepada produktiviti di sektor pembinaan di Malaysia. Kesan daripada halangan bahasa ini telah memberi risiko terhadap kemalangan dan pembaziran masa serta tenaga kerja.
Yap and Ahmad (2021)	Kuantitatif	Soal selidik	Halangan bahasa dan keterbatasan komunikasi Persekitaran kerja yang tidak kondusif	Hasil analisis deskriptif menunjukkan keadaan kerja merupakan faktor utama pengambilan pekerja asing dalam industri pembuatan di Johor. Ketersediaan dan keadaan kerja pekerja asing mempunyai hubungan signifikan dengan persepsi prestasi kerja. Walau bagaimanapun, latar belakang pendidikan tidak mempunyai hubungan yang signifikan dengan persepsi prestasi kerja. Tambahan pula, halangan bahasa juga telah mempengaruhi kualiti kerja.
Aznan and Ishak (2021)	Kuantitatif	Soal selidik	Halangan bahasa dan keterbatasan komunikasi Persekitaran kerja yang tidak kondusif	Hasil menunjukkan bahawa majoriti pekerja asing tidak pandai menyuarakan pendapat kerana kemahiran komunikasi yang lemah. Selain itu, bagi masalah sosial dan sikap, kebanyakan pekerja asing tidak mematuhi peraturan bekerja dan keselamatan semasa bekerja di tapak. Tambahan pula, kos dan pengambilan pekerja asing adalah tinggi serta mengambil masa terlalu lama. Dapatan kajian menunjukkan bahawa kos pengambilan pekerja asing merupakan satu beban yang signifikan. Isu terakhir yang dikenal pasti ialah tahap produktiviti, di mana majoriti pekerja asing didapati tidak memenuhi spesifikasi kerja yang ditetapkan.
Basalamah et al. (2021)	Kualitatif	Temu bual mendalam dan pemerhatian	Halangan bahasa dan keterbatasan komunikasi	Hasil kajian mendapati bahawa pekerja perlulah menguasai bahasa formal sebagai sebahagian daripada budaya Jepun di sektor perhotelan. Hal ini demikian kerana, komunikasi formal lebih diperlukan dan penting dalam komunikasi bertulis berbanding komunikasi lisan, memandangkan kebanyakan pelancong mampu bertutur dalam bahasa Inggeris. Sehubungan dengan itu, penguasaan terhad dalam bahasa Jepun telah menyebabkan pekerja cenderung untuk mengelak daripada bertanya dan tidak memberi sebarang maklum balas dengan rakan sekerja.

Jadual 3 (*sambungan*)

Penulis	Kaedah Metodologi	Instrumen Kajian	Tema	Kesan Keterbatasan Komunikasi
Mattila et al. (2021)	Kualitatif	Temu bual separa berstruktur	Halangan bahasa dan keterbatasan komunikasi Keselamatan dan kesihatan Persekitaran kerja yang tidak kondusif	Bekerja di ladang menuntut tahap keupayaan fizikal yang tinggi, manakala status sebagai pekerja asing pula memberi kesan terhadap kehidupan sosial, termasuklah berpisah daripada keluarga serta berdepan tekanan daripada komuniti tempatan untuk membantu mendapatkan pekerjaan untuk orang lain. Selain itu, teknologi komunikasi membolehkan pekerja asing kekal berhubung dengan keluarga mereka. Majikan pula boleh meningkatkan kualiti kerja dan kehidupan pekerja asing dengan memperbaiki pengurusan kerja, keadaan tempat kerja serta menyediakan latihan berterusan. Program orientasi dan latihan ini perlu dirancang dengan baik, dengan mengambil kira tahap penguasaan bahasa, kemahiran kerja, dan peluang perkembangan kerjaya pekerja.
Mohd Salleh et al. (2021)	Kuantitatif	Soal selidik	Halangan bahasa dan keterbatasan komunikasi Persekitaran kerja yang tidak kondusif	Hasil kajian mendapati bahawa isu halangan bahasa dan diskriminasi telah memberi kesan kepada produktiviti kerja pekerja asing. Pembolehubah diskriminasi menunjukkan hubungan positif yang kuat terhadap produktiviti kerja. Pekerja asing sering didiskriminasi oleh majikan tempatan dan menyebabkan pekerja asing menghadapi tekanan, penurunan kepuasan, komitmen dan tingkah laku yang tidak memuaskan.
Rehman and Ishak (2022)	Kuantitatif	Soal selidik	Halangan bahasa dan keterbatasan komunikasi Persekitaran kerja yang tidak kondusif	Pengurusan risiko yang tidak berkesan dalam projek pembinaan memberi kesan kepada kelewatan, pemberhentian sepenuhnya dalam aktiviti, kos dan masa. Risiko projek pembinaan wujud apabila berlakunya ketidakpastian kualiti, kos dan masa penyiapan. Komunikasi berkesan merupakan komponen penting yang menyumbang kepada kejayaan pelaksanaan projek. Salah satu ciri utama kejayaan projek ialah aliran maklumat yang berkesan antara pihak pengurusan dan pasukan pelaksana, sama ada dari peringkat atasan ke bawahan mahupun sebaliknya, kerana ia dapat meningkatkan kualiti proses pembinaan, mengurangkan konflik, serta mempertingkatkan prestasi pasukan projek. Keputusan memaparkan komunikasi berkesan mempunyai pengaruh positif ke atas pengurusan risiko pembinaan beserta kesan penyederhanaan positif Akta, undang-undang dan dasar kerajaan.

Jadual 3 (*sambungan*)

Penulis	Kaedah Metodologi	Instrumen Kajian	Tema	Kesan Keterbatasan Komunikasi
Fellows et al. (2023)	Kualitatif	Temu bual dan pemerhatian	Halangan bahasa dan keterbatasan komunikasi	Hasil kajian mendapati bahawa pekerja yang tidak berkongsi bahasa yang sama mengemukakan isu keselamatan, integrasi dan produktiviti di tempat kerja. Kerja bahasa jurubahasa tidak formal diterokai melalui data ini dan kanta teori; tugas bahasa mereka dan sifat kerja bahasa mereka dikenal pasti, termasuk penggunaan visual, gerak isyarat dan teknologi. Keadaan ini menyebabkan penyampaian mesej menjadi kurang jelas, manakala penerima pula berisiko untuk salah faham, terlupa atau tidak mengendahkan maklumat yang disampaikan walaupun penjelasan telah diberikan dengan baik.
Rotimi et al. (2023)	Kuantitatif	Soal selidik berstruktur	Persekitaran kerja yang tidak kondusif	Pekerja asing di tapak pembinaan sering menghadapi pelbagai cabaran dan risiko terhadap ketidakpuasan kerja berbanding pekerja tempatan. Kajian ini menekankan kepentingan menyediakan peluang untuk kemajuan pengetahuan dan kemajuan kerjaya bagi pekerja binaan migran untuk meningkatkan kepuasan kerja mereka. Hasil kajian mendapati pekerja binaan migran China secara amnya berpuas hati dengan pekerjaan mereka dan akan melanjutkan tempoh mereka jika peluang pekerjaan disediakan. Keputusan mengesahkan bahawa bayaran gaji dan peluang untuk kemajuan ilmu dan kemajuan kerjaya membawa kepada peningkatan kepuasan kerja, manakala kesunyian mengurangkan kepuasan kerja. Peluang untuk peningkatan pengetahuan dan kemajuan kerjaya mencetuskan lebih kepuasan daripada bayaran gaji.
Dzawanda et al. (2024)	Campuran	Soal selidik, temu bual dan pemerhatian	Halangan Bahasa dan keterbatasan komunikasi Persekitaran kerja yang tidak kondusif	Penemuan daripada penyelidikan menunjukkan bahawa tekanan kerja atau beban kerja, halangan bahasa, kekurangan latihan, budaya, dan ketakutan melaporkan kemalangan adalah lima halangan utama yang membawa kepada komunikasi yang lemah dan penyertaan pekerja dalam pencegahan kemalangan. Komunikasi yang lemah membawa kepada tekanan kerja/lebih beban, kemalangan, produktiviti.

Jadual 3 (*sambungan*)

Penulis	Kaedah Metodologi	Instrumen Kajian	Tema	Kesan Keterbatasan Komunikasi
Kuoribo et al. (2024)	Kuantitatif	Soal selidik	Halangan Bahasa dan keterbatasan komunikasi Persekitaran kerja yang tidak kondusif	Perbezaan pelbagai bahasa dan budaya tenaga kerja pembinaan dalam pasukan pengurusan projek memberi kesan kepada produktiviti projek. Bahkan, amalan menyalahkan pihak lain yang dipanggil sebagai *"scapegoatism"*, telah disenaraikan sebagai kesan ketiga tertinggi yang turut memburukkan suasana kerja apabila pekerja dipersalahkan atas kesilapan yang berlaku berbanding berusaha dalam mencari penyelesaian secara kolektif dan konstruktif.
Goh et al. (2024)	Campuran	Soal selidik dan temu bual	Halangan bahasa dan keterbatasan komunikasi Keselamatan dan kesihatan Persekitaran kerja yang tidak kondusif	Keputusan menunjukkan bahawa tiada bukti untuk menggunakan sebarang alternatif untuk mengatasi masalah komunikasi, tetapi responden telah mengesyorkan pilihan lain iaitu penggunaan bahasa badan. Dapatan kajian menunjukkan bahawa selain daripada penurunan produktiviti pekerja, terdapat beberapa akibat negatif kegagalan komunikasi yang boleh membawa kepada kegagalan pembinaan. Penambahan kos projek, perselisihan faham, kelewatan projek, dan bahaya keselamatan dan kesihatan adalah semua akibat negatif daripada komunikasi yang lemah.
Alruwaili et al. (2025)	Kualitatif	Temu bual separa berstruktur	Halangan bahasa dan keterbatasan komunikasi Keselamatan dan kesihatan	Hasil kajian mendapati bahawa terdapat jurang ketara antara pekerja asing dan pekerja tempatan. Pekerja asing melaporkan cabaran yang lebih besar berkaitan dengan halangan bahasa, stigma budaya dan kekurangan akses kepada sokongan mental. Seterusnya, halangan kepada kualiti kerja adalah penglibatan kepimpinan yang terhad, stigma, kekangan sumber dan latihan organisasi yang tidak mencukupi. Latihan kesihatan dan keselamatan sedia ada banyak tertumpu pada keselamatan fizikal tetapi kekurangan program terhadap kesihatan mental.
Bariono and Kamaruding (2025)	Campuran	Soal selidik dan temu bual	Halangan bahasa dan keterbatasan komunikasi Keselamatan dan kesihatan	Hasil dapatan mendapati bahawa kesukaran yang dihadapi oleh pekerja asing dalam sektor pembinaan. Halangan bahasa mempunyai RII terbesar yang mempengaruhi komunikasi teknikal di tapak pembinaan. Seterusnya, akibat negatif yang paling ketara adalah kualiti kerja. Hal ini demikian kerana, pekerja asing yang berpengalaman dalam pembinaan adalah penting untuk memajukan projek dengan jayanya.

Jadual 3 (*sambungan*)

Penulis	Kaedah Metodologi	Instrumen Kajian	Tema	Kesan Keterbatasan Komunikasi
Olanrewaju et al. (2025)	Kuantitatif	Soal selidik	Halangan bahasa dan keterbatasan komunikasi Persekitaran kerja yang tidak kondusif	Penemuan daripada kajian menunjukkan hubungan signifikan sebanyak 95% halangan komunikasi memberi impak kepada proses komunikasi dan produktiviti di tapak pembinaan Nigeria. Sebanyak empat faktor yang menjadi penghalang kepada keberkesanan komunikasi, iaitu pengurusan, pekerja, organisasi dan pekerjaan. Objektif dan arahan yang tidak jelas daripada penyelia telah memberi kesan kepada produktiviti industri.
Maung and Siriwato (2025)	Kualitatif	Temu bual separa berstruktur	Halangan bahasa dan keterbatasan komunikasi Persekitaran kerja yang tidak kondusif	Hasil kajian mendapati bahawa terdapat dua aspek utama yang berlaku ke atas pekerja asing. Pertama, pekerja asing di bawah sistem SSW tidak mengalami pencabulan hak buruh. Kedua, halangan bahasa merupakan cabaran yang ketara. Hal ini demikian kerana, pekerja melaporkan kesukaran semasa berkomunikasi dengan masyarakat Jepun.
Salombe et al. (2025)	Kualitatif	Temu bual separa berstruktur	Halangan bahasa dan keterbatasan komunikasi	Penemuan itu mendedahkan ketidakpadanan linguistik antara latihan bahasa Jepun di Institusi Latihan Pekerjaan (LPK) di Indonesia dan Organisasi Penerimaan (AO) di Jepun dengan tuntutan komunikasi sebenar yang dihadapi di tempat kerja. Walaupun program latihan memberi tumpuan kepada tatabahasa dan bahasa Jepun yang diseragamkan, mereka tidak mempunyai persediaan yang mencukupi untuk kemahiran komunikasi dunia sebenar yang bergantung kepada konteks yang diperlukan di tempat kerja. Halangan seperti pemahaman terhad tentang istilah teknikal dan dialek tempatan menghalang penyesuaian yang berkesan.

Sumber: Hasil dapatan penulis

Secara keseluruhannya, produktiviti pekerja asing tidak dipengaruhi oleh satu faktor secara berasingan, tetapi berlaku hasil daripada pelbagai faktor yang telah dianalisis. Maka, usaha meningkatkan produktiviti pekerja asing memerlukan pendekatan yang menyeluruh dengan mengambil kira hubungan antara faktor-faktor tersebut dan tidak hanya tertumpu kepada satu aspek sahaja.

Dari aspek metodologi, majoriti kajian lepas cenderung menggunakan pendekatan kuantitatif melalui pengedaran borang soal selidik kepada responden. Pendekatan ini bertujuan untuk menganalisis hubungan signifikan antara pemboleh ubah yang dikaji dengan produktiviti pekerja dalam sesebuah organisasi. Sementara itu, kajian selebihnya tidak mengehadkan skop kepada data berangka semata-mata, malah turut mengintegrasikan kaedah temu bual dan pemerhatian bagi meneroka faktor serta punca berlakunya sesuatu isu dalam konteks dunia sebenar.

Walaupun kajian ini memberikan input yang bersistematik, terdapat beberapa batasan yang perlu diambil perhatian. Kajian ini mempunyai batasan dari segi tempoh sorotan literatur, di mana rujukan hanya dihadkan kepada penulisan dalam tempoh lima tahun terkini. Kekangan tempoh ini berkemungkinan mengecualikan dapatan kajian terdahulu yang relevan, sekali gus mengehadkan gambaran trend jangka panjang dalam bidang ini secara menyeluruh. Penyelidikan akan datang harus mempertimbangkan pelanjutan tempoh masa untuk mendapatkan kajian-kajian lepas yang lebih komprehensif, sekali gus membolehkan analisis dilakukan terhadap evolusi trend dan perubahan corak produktiviti pekerja dalam jangan masa panjang. Tambahan pula, isu halangan bahasa dalam kalangan pekerja asing sering dikaji, tetapi tumpuan kajian daripada pakar bidang linguistik masih berkurangan dan sebahagian besar penyelidikan lepas didominasi oleh bidang bukan linguistik seperti bidang pengurusan, ekonomi dan kejuruteraan. Namun, perspektif daripada bidang bahasa dan linguistik masih terhad, sedangkan analisis linguistik yang mendalam amat diperlukan untuk memahami struktur halangan tersebut dengan lebih mendalam. Oleh itu, kajian pada masa hadapan diharapkan dapat memberi lebih tumpuan kepada sudut pandang linguistik bagi merapatkan jurang ilmu ini.

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RUJUKAN

Ali, A. S., Smith, A., Pitt, M., & Chan, H. C. (2010). Contractors' perception of factors contributing to project delay: Case studies of commercial projects in Klang Valley, Malaysia. *Journal of Design and Built Environment, 7*, 43-57. https://borneojournal.um.edu.my/index.php/jdbe/article/view/5300

Alruwaili, M. M., Munir, F., Carrillo, P., & Soetanto, R. (2025). Exploring health, safety, and mental health practices in the Saudi construction sector – Knowledge, awareness, and interventions: A semi-structured interview. *Safety, 11*(3), Article 90. https://doi.org/10.3390/safety11030090

Aznan, N. N. Z., & Ishak, N. (2021). The issues of employing foreign workers in Malaysian construction industry. *5th International Undergraduate Seminar on Built Environment and Technology (USBET).* https://ir.uitm.edu.my/id/eprint/133992

Bariono, N. S. E., & Kamaruding, M. (2025). Initiatives to overcome the issues and negative impacts on the involvement of foreign laborers in the Malaysian construction industry. *Jurnal Kejuruteraan, 37*(2), 855-867. https://doi.org/10.17576/jkukm-2025-37(2)-24

Basalamah, A., Ardani, E. G., & Fransisca, A. (2021). Communication challenges for foreign workers within multicultural hospitality working environment: Case front office of Hotel X in Japan. *International Journal of Social Science and Business, 5*(1), 120-126. https://doi.org/10.23887/ijssb.v5i1.32295

Dzawanda, B., Chari, A., & Matsa, M. M. (2024). Towards a safety climate framework to improve communication and worker involvement in occupational accident prevention at construction sites in Zimbabwe. *Safety in Extreme Environments, 6*, 1-13. https://doi.org/10.1007/s42797-023-00092-6

Deraman, S., & Mohd Isa, S. Z. (2016). Tahap kepuasan kerja dalam kalangan kakitangan penjara. *Jurnal Komunikasi, 1*, 149-161.

Duman, G., Orhon, G., & Gedik, N. (2015). Research trends in mobile assisted language learning from 2000 to 2012. *ReCALL, 27*(2), 197-216. https://doi.org/10.1017/S0958344014000287

Eko Bariano, N. S., & Kamaruding, M. (2025). Initiatives to overcome the issues and negative impacts on the involvement of foreign laborers in the Malaysian construction industry. *Jurnal Kejuruteraan, 37*(2), 855-867. https://doi.org/10.17576/jkukm-2025-37(2)-24

Fellows, M. F., Phua, F. T. T., & Tutt, D. E. (2023). Building bridges: The bilingual language work of migrant construction workers. *Construction Management and Economics, 41*(2), 153-171. https://doi.org/10.1080/01446193.2022.2151022

Ghani, M., Muhamad Zamani, N. F., Rozman Azram, A. A., Rahmat, N. H., Omar, S. K., & Md Sharif, N. F. (2022). An investigation of perceptual, verbal, and non-verbal barriers in the workplace. *International Journal of Asian Social Science, 12*, 347-359. https://doi.org/10.55493/5007.v12i9.4604

Goh, K. C., Zainordin, N., & Khoo, S. L. (2024). Verbal communication between contractors and foreign workers. *Malaysian Construction Research Journal, 21*(1), 179-193.

Gusenbauer, M., & Haddaway, N. R. (2020). Which academic search systems are suitable for systematic review or meta-analyses? Evaluating retrieval qualities of Google Scholar, PubMed, and 26 other resources. *Research Synthesis Methods, 11*(2), 181-217. https://doi.org/10.1002/jrsm.1378

Hanaysha, J. (2016). Testing the effects of employee empowerment, teamwork and employee training on employee productivity in higher education sector. *International Journal of Learning & Development, 6*(1), 164-178. https://doi.org/10.5296/ijld.v6i1.9200

Ismail, S. H., & Ahmad, N. (2020). *Hubungan di antara persekitaran kerja dan produktiviti tenaga kerja dalam sektor pembuatan*. Penerbit UTHM.

Jabatan Imigresen Malaysia. (2022, February 9). Kekurangan pekerja asing terus jejas produktiviti. *Utusan Malaysia*, p. 34.

Kaushik, V., Walsh, C. A., & Haefele, D. (2016). Social integration of immigrants within the linguistically diverse workplace: A systematic review. *Review of Social Sciences, 1*(1), 15-25. https://doi.org/10.18533/rss.v1i1.5

Kuoribo, E., Amoah, P., Kissi, E., Edwards, D. J., & Thwala, W. D. (2024). Analysing the effect of multicultural workforce/teams on construction productivity. *Journal of Engineering, Design and Technology, 22*(3), 969-990. https://doi.org/10.1108/JEDT-11-2021-0636

Mattila, T. E. A., Ovaska, U., Kinnunen, B., Tuure, V., Leppälä, J., Taattola, K., Rinnola, V., & Rautiainen, R. H. (2021). Experiences and challenges of foreign agricultural workers in Finland. *Journal of Agricultural Safety and Health, 27*(1), 13-28. https://doi.org/10.13031/jash.13893

Maung, M. T., & Siriwato, S. (2025). Myanmar migrant workers in Japan: A case study of specified skilled workers (SSW). *Journal of Contemporary Social Sciences and Humanities, 12*(1), 50-70. https://doi.org/10.59796/jcsh.v12i1.50-70

Memon, H. A., AbdulRahman, I., Abdulllah, R. M., & Abdul Aziz, A. A. (2011). Time overrun in construction project from the perspective of project management consultant. *Journal of Surveying, Construction & Property, 1*(1), 54-66.

Ministry of Health, Labour and Welfare. (2023). Working conditions handbook.Retrievedfrom https://www.mhlw.go.jp/content/001113033.pd

Mohd Salleh, M., Mohi, Z., Nordin, N., Mohamad, N. A., & Razali, N. A. S. (2021). The impact of language barriers and discrimination issues on work productivity of foreign workers. *International Journal of Academic Research in Business and Social Sciences, 11*(16), 42-52. https://doi.org/10.6007/IJARBSS/v11-i16/11215

Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & The PRISMA Group. (2010). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *International Journal of Surgery, 8*(5), 336-341. https://doi.org/10.1016/j.ijsu.2010.02.007

Nahartini, D., Dewi, R. S., Fitriah, S., Defianty, M., & Anasy, Z. (2021). The quest of developing a better English training material for migrant worker candidates in Indonesia. *English Review: Journal of English Education, 10*(1), 159-174. https://doi.org/10.25134/erjee.v10i1.5366

Ne' Matullah, K. F., Pek, L. S., & Roslan, S. A. (2021). Investigating communicative barriers on constructive industry productivity in Malaysia: An overview. *International Journal of Evaluation and Research in Education, 10*(2), 476-482. https://doi.org/10.11591/ijere.v10i2.21163

Nissi, R., Blåsjö, M., & Jonsson, C. (2021). Workplace communication in flux: From discrete languages, text genres and conversations to complex communicative situations. *Applied Linguistics Review, 14*(4), 679-695. https://doi.org/10.1515/applirev-2021-0052

Olanrewaju, O. I., Bello, A. O., Semiu, M. A., & Mudashiru, S. A. (2025). Critical barriers to effective communication in the construction industry: Evidence from Nigeria. *International Journal of Construction Management, 25*(7), 783-801. https://doi.org/10.1080/15623599.2024.2362018

Olanrewaju, A., Tan, S. W., & Kwan, L. F. (2017). Roles of communication of performance of the construction sector. *Procedia Engineering, 196*, 763-770. https://doi.org/10.1016/j.proeng.2017.08.005

Othman, A. A., Torrance, J. V., & Hamid, M. A. (2006). Factors influencing the construction time of civil engineering projects in Malaysia. *Engineering, Construction and Architectural Management, 13*(1), 481-501. https://doi.org/10.1108/09699980610690756

Page, M. J., Moher, D., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., & McKenzie, J. E. (2021). PRISMA 2020 explanation and elaboration: Updated guidance and exemplars for reporting systematic reviews. *BMJ, 372*, Article n160. https://doi.org/10.1136/bmj.n71

Putri, L. W. B. (2022). Systematic literature review: The impact of using Chinese language on effectiveness in business communication. *Journal of Interconnected Social Science (JISS), 1*(1), 59-71. https://dynamicjournal.my.id/index.php/JISS/article/view/6

Petticrew, M., & Roberts, H. (2006). *Systematic reviews in the social sciences: A practical guide*. Blackwell.

Rehman, M. A., & Ishak, M. S. (2022). Role of government acts, laws and policies between effective communication and construction risk management. *Journal of Applied Structural Equation Modeling, 6*(2), 1-22. https://doi.org/10.47263/JASEM.6(2)03

Rose, H., Briggs, J. G., Boggs, J. A., Sergio, L., & Ivanova-Slavianskaia, N. (2018). A systematic review of language learner strategy research in the face of self-regulation. *System, 72*, 151-163. https://doi.org/10.1016/j.system.2017.12.002

Rotimi, F. E., Rotimi, J. O. B., Silva, C. C., Olatunji, O. A., & Ramanayaka, C. E. D. (2023). The determinants of job satisfaction amongst specific migrant construction workers. *Built Environment Project and Asset Management, 13*(5), 738-755. https://doi.org/10.1108/BEPAM-06-2022-0078

Salombe, F. D., Iskandar, K., & Rustam, M. R. (2025). Language barriers: Language training mismatch and communication challenges among Indonesian Technical Intern (TITP) in Japan. *KIRYOKU, 9*(2), 455-469. https://doi.org/10.14710/kiryoku.v9i2.455-469

Sambasivan, M., & Soon, W. Y. (2007). Causes and effects of delays in Malaysian construction industry. *International Journal of Project Management, 25*, 517-526. https://doi.org/10.1016/j.ijproman.2006.11.007

Shaffril, H. A. M., Samah, A. A., & Samsuddin, S. F. (2021). Guidelines for developing a systematic literature review for studies related to climate change adaptation. *Environmental Science and Pollution Research, 28*(18), 22265-22277. https://doi.org/10.1007/s11356-021-13178-0

Shah, A., & Yusof, T. A. (2018). Apply laws to foreign labour too. *New Straits Times*. https://www.nst.com.my/news/exclusive/2018/08/398466/exclusive-apply-laws-foreign-labour-too

Tan, C. K., & Abdul-Rahman, H. (2011). Study of quality management in construction projects. *Chinese Business Review, 10*(7), 542-552.

Yap, W. X., & Ahmad, N. (2021). The relationship between employment factors and perceived job performance among foreign workers in manufacturing industry. *Research in Management of Technology and Business, 2*(1), 153-165. https://penerbit.uthm.edu.my/periodicals/index.php/rmtb/article/view/1988

Ye, K., & Rahman, H. (2010). Risk of late payment in the Malaysian construction industry. *International Journal of Social, Management, Economics and Business Engineering, 4*(5), 503-511. https://doi.org/10.5281/zenodo.1329721

Zhong, X., Ang, L. H., & Sharmini, S. (2023). Systematic literature review of conversational code-switching in multilingual society from a sociolinguistic perspective. *Theory & Practice in Language Studies (TPLS), 13*(2), 318. https://doi.org/10.17507/tpls.1302.06

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Artikel Ulasan

Tinjauan Literatur Sistematik Terhadap Aplikasi Realiti Maya (VR) Dalam Pedagogi Pendidikan Murid Bermasalah Pendengaran

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ABSTRAK

Kajian ini merupakan satu tinjauan literatur sistematik yang bertujuan menganalisis penggunaan Realiti Maya (Virtual Reality, VR) dalam pedagogi pendidikan murid bermasalah pendengaran, dengan memberi tumpuan kepada trend kajian, tema utama serta jurang dalam literatur bagi tempoh 2000 hingga Mei 2026. Pencarian literatur dilaksanakan secara sistematik melalui pangkalan data akademik utama, manakala pemilihan kajian dilakukan berdasarkan kriteria inklusi dan eksklusi yang ditetapkan serta berpandukan garis panduan PRISMA 2020. Sebanyak 45 kajian yang memenuhi kriteria kelayakan telah dikenal pasti dan dianalisis menggunakan pendekatan deskriptif serta tematik, dengan dapatan menunjukkan bahawa kajian berkaitan penggunaan VR dalam pendidikan murid bermasalah pendengaran semakin berkembang pesat, khususnya selepas tahun 2020. Analisis tematik mengenal pasti enam tema utama, iaitu keterangkuman VR/AR, bahasa isyarat dan kecerdasan buatan (AI), pembelajaran bahasa dan kognitif, gamifikasi, interaksi multimodal serta penerimaan teknologi. Walau bagaimanapun, beberapa jurang turut dikenal pasti, termasuk dominasi kajian berskala kecil, kekurangan kajian longitudinal, integrasi VR yang terhad dalam persekitaran bilik darjah sebenar, konteks kajian yang sempit serta kurangnya perhatian terhadap perkembangan sosial dan emosi murid. Kesimpulannya, tinjauan ini menegaskan potensi besar VR dalam menyokong pembelajaran inklusif dan inovatif bagi murid bermasalah pendengaran, namun jurang metodologi yang dikenal pasti menunjukkan keperluan untuk kajian berskala lebih besar, longitudinal dan berasaskan bilik darjah sebenar. Justeru, kajian masa depan perlu memberi penekanan kepada keberkesanan jangka panjang serta integrasi

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holistik VR dalam konteks pengajaran sebenar, bagi memastikan perkembangan kognitif dan sosioemosi murid dapat disokong secara menyeluruh.

Kata Kunci: Pedagogi, pendidikan khas, realiti maya, teknologi imersif, tinjauan literatur sistematik, murid bermasalah pendengaran

Systematic Literature Review on the Application of Virtual Reality (VR) in the Pedagogy of Education for Students with Hearing Impairments

ABSTRACT

This study is a systematic literature review aimed at analysing the use of Virtual Reality (VR) in the pedagogy of students with hearing impairments, with a focus on research trends, key themes, and gaps in the literature between 2000 and May 2026. The literature search was conducted systematically across major academic databases, while study selection was based on established inclusion and exclusion criteria and guided by the PRISMA 2020 framework. A total of 45 eligible studies were identified and analysed using descriptive and thematic approaches, with findings indicating that research on the use of VR in the education of students with hearing impairments has grown significantly, particularly since 2020. Thematic analysis identified six major themes: VR/AR inclusivity, sign language and artificial intelligence (AI), language and cognitive learning, gamification, multimodal interaction, and technology acceptance. Nevertheless, several gaps were observed, including the predominance of small-scale studies, the lack of longitudinal research, limited integration of VR in real classroom settings, narrow research contexts, and insufficient attention to students' social and emotional development. In conclusion, this review highlights the growing potential of VR to support inclusive and innovative learning for students with hearing impairments, while also underscoring the need for larger-scale, longitudinal, and classroom-based studies. Future research should therefore prioritise long-term effectiveness and the holistic integration of VR into authentic teaching contexts, ensuring that both cognitive and socio-emotional development are adequately addressed.

Keywords: *Immersive technology, pedagogy, special education, students with hearing impairment, systematic literature review, Virtual Reality (VR)*

PENGENALAN

Pendidikan murid bermasalah pendengaran masih berhadapan dengan cabaran dalam memastikan akses yang setara kepada kandungan kurikulum, khususnya dalam persekitaran bilik darjah yang banyak bergantung pada input auditori dan teks (Antia et al., 2020; Marschark & Knoors, 2012). Cabaran ini tidak hanya mempengaruhi kefahaman konsep, tetapi turut berkait dengan perkembangan bahasa, kognitif, literasi dan sosioemosi, yang boleh memberi kesan terhadap pencapaian akademik dalam jangka panjang (Calderon

& Naidu, 2020; Geers & Nicholas, 2020; Hall et al., 2017; Porcar-Gozalbo et al., 2024; Tomblin et al., 2015). Pelbagai sokongan seperti Pelan Pendidikan Individu (IEP), bahasa isyarat dan bahan visual telah digunakan untuk mengurangkan cabaran tersebut. Namun, pelaksanaannya masih berbeza mengikut kesiapsiagaan guru, kapasiti sekolah dan ketersediaan sumber sokongan (Luckner & Bowen, 2020; Wong & Rashid, 2022). Keadaan ini menunjukkan bahawa pendekatan pedagogi sedia ada masih perlu diperkukuh agar lebih responsif terhadap kepelbagaian keperluan pembelajaran murid bermasalah pendengaran.

Perkembangan teknologi pendidikan pula membuka ruang kepada penggunaan teknologi imersif sebagai salah satu pendekatan untuk melengkapkan kaedah pengajaran sedia ada (Hew & Brush, 2007, 2019; Luckin et al., 2016). Realiti maya (VR), khususnya, menyediakan persekitaran pembelajaran yang membolehkan murid meneroka simulasi, berinteraksi dengan objek dan mengalami situasi pembelajaran yang sukar diwujudkan melalui penyampaian konvensional (Kaplan-Rakowski & Thrasher, 2025; Radianti et al., 2020). Dari sudut teori pembelajaran, penggunaan VR sering dikaitkan dengan konstruktivisme kerana pengetahuan dibina melalui pengalaman dan interaksi dengan persekitaran pembelajaran (Dalgarno & Lee, 2010; Slater & Sanchez-Vives, 2016). Bagi murid bermasalah pendengaran, keupayaan VR untuk menyampaikan maklumat secara visual dan spatial berpotensi memberikan bentuk pengalaman pembelajaran yang lebih selaras dengan keperluan mereka (Antia et al., 2020; Marschark & Knoors, 2012; Mayer, 2009; Sweller et al., 2011). Walau bagaimanapun, kelebihan tersebut tidak semestinya menghasilkan peningkatan pembelajaran secara langsung. Keberkesanan VR dipengaruhi oleh reka bentuk pedagogi, kandungan, bentuk interaksi dan konteks penggunaannya dalam pengajaran sebenar (Fowler, 2015; Jensen & Konradsen, 2018; Makransky & Petersen, 2021; Merchant et al., 2014; Parong & Mayer, 2018; Radianti et al., 2020).

Walaupun minat terhadap VR dalam pendidikan semakin meningkat, literatur khusus berkaitan murid bermasalah pendengaran masih menunjukkan beberapa keterbatasan. Kajian terdahulu tersebar merentas bidang seperti teknologi pendidikan, interaksi manusia-komputer, pendidikan khas dan pembangunan sistem, menyebabkan hubungan antara kerangka teori, reka bentuk teknologi dan amalan pedagogi belum dapat dihuraikan secara menyeluruh (Demir, 2022; Radianti et al., 2020). Sebahagian besar kajian juga memberikan perhatian kepada pembangunan teknologi dan aspek teknikal, sedangkan pelaksanaan VR dalam proses pengajaran dan pembelajaran di bilik darjah masih kurang diterokai (Antia et al., 2020; Marschark & Knoors, 2012). Persoalan berkaitan kesiapsiagaan guru, kesesuaian VR dengan kurikulum, kebolehskalaan pelaksanaan dan keberkesanan dalam konteks pendidikan sebenar juga belum mendapat perhatian yang mencukupi (Hew & Brush, 2019). Selain itu, keterbatasan kajian jangka panjang

menyukarkan penilaian terhadap sama ada manfaat penggunaan VR dapat dikekalkan dan diterjemahkan kepada peningkatan pembelajaran dari semasa ke semasa.

Keadaan tersebut menunjukkan keperluan untuk melihat perkembangan kajian VR bukan hanya dari sudut kemajuan teknologi, tetapi juga berdasarkan perubahan fokus kajian, pendekatan pedagogi, reka bentuk kajian dan bukti empirikal yang dihasilkan. Walaupun terdapat kajian berkaitan VR untuk murid bermasalah pendengaran, pengetahuan tentang pola perkembangan bidang tersebut masih bersifat terpisah. Belum jelas bagaimana fokus kajian berubah mengikut tempoh, di mana kajian dijalankan, reka bentuk dan kaedah statistik yang digunakan, serta tema pedagogi yang paling banyak diberi perhatian. Kekurangan sintesis yang menyatukan aspek-aspek tersebut menyukarkan usaha untuk mengenal pasti arah perkembangan bidang dan jurang yang masih memerlukan penelitian.

Sehubungan itu, kajian ini menjalankan tinjauan literatur sistematik terhadap kajian VR dalam pendidikan murid bermasalah pendengaran bagi tempoh 2000 hingga Mei 2026. Kajian ini mempunyai tiga tujuan utama: (1) menganalisis trend penerbitan berdasarkan tahun, lokasi kajian, reka bentuk kajian dan kaedah statistik; (2) mengenal pasti tema utama berkaitan penggunaan VR dalam pedagogi murid bermasalah pendengaran; dan (3) mengenal pasti jurang kajian dari aspek teknologi, pedagogi, metodologi dan pelaksanaan. Sintesis ini diharapkan dapat memberikan gambaran yang lebih menyeluruh tentang perkembangan bidang serta menyediakan asas untuk kajian yang lebih berorientasikan pedagogi dan keperluan

SOROTAN KAJIAN

Kehilangan pendengaran (*hearing loss*, HL) merupakan isu kesihatan dan pendidikan yang melibatkan lebih daripada 1.5 bilion individu di seluruh dunia, dan jumlah ini diunjurkan meningkat kepada kira-kira 2.5 bilion menjelang tahun 2050 (WHO, 2021, 2023). HL merangkumi spektrum tahap keparahan daripada ringan hingga sangat teruk, manakala individu yang mengalaminya lazimnya dikategorikan sebagai kurang pendengaran atau pekak berdasarkan tahap fungsi pendengaran dan pilihan komunikasi (Marschark et al., 2011; WHO, 2021). Dalam konteks pendidikan, kesan HL tidak terbatas kepada aspek pendengaran, tetapi turut berkait dengan perkembangan bahasa, literasi dan pencapaian akademik. Kekurangan akses kepada input auditori, khususnya pada tempoh kritikal perkembangan bahasa, boleh menjejaskan pemerolehan bahasa, penguasaan kosa kata dan kefahaman bacaan (Marschark et al., 2011; Mayer & Trezek, 2018; Qi & Mitchell, 2012). Cabaran tersebut turut mempunyai kaitan dengan tuntutan kognitif pembelajaran yang berasaskan verbal, termasuk keperluan terhadap memori kerja, perhatian dan pemprosesan maklumat (Hauser et al., 2010; Marschark et al., 2015). Kesannya, murid bermasalah pendengaran berisiko berhadapan dengan jurang pencapaian

yang berterusan, terutama dalam bidang pembelajaran yang banyak bergantung pada literasi dan komunikasi verbal (Knoors & Marschark, 2014; Mayer & Trezek, 2018).

Cabaran tersebut menjadi lebih ketara apabila persekitaran pengajaran tidak menyediakan akses komunikasi yang mencukupi. Kebergantungan terhadap penyampaian lisan boleh mengehadkan kefahaman dan penyertaan murid bermasalah pendengaran dalam aktiviti bilik darjah, termasuk pembelajaran kolaboratif yang memerlukan interaksi secara berterusan (Marschark & Knoors, 2012; UNESCO, 2020). Kekurangan sari kata, sokongan visual dan akses kepada jurubahasa bahasa isyarat yang konsisten turut menjejaskan peluang murid mengikuti kandungan pembelajaran secara setara (UNESCO, 2020; WHO, 2021). Faktor persekitaran ini berinteraksi dengan aspek individu seperti motivasi, literasi, penguasaan bahasa isyarat dan pengalaman pembelajaran akademik, yang kesemuanya boleh mempengaruhi pencapaian pendidikan (Antia et al., 2009; Elias et al., 2010; Marschark et al., 2011; Reed et al., 2008). Dari perspektif sosioemosi pula, keterbatasan komunikasi dan interaksi dengan rakan sebaya boleh meningkatkan risiko pengasingan sosial serta menjejaskan keyakinan dan hubungan sosial murid (Bat-Chava & Deignan, 2001; Theunissen et al., 2014). Keadaan ini menunjukkan bahawa cabaran pendidikan murid bermasalah pendengaran bukan semata-mata berkaitan dengan keupayaan individu, tetapi turut dipengaruhi oleh sejauh mana persekitaran pembelajaran menyediakan akses yang sesuai dengan keperluan komunikasi mereka.

Perkembangan teknologi pendidikan membuka ruang kepada pendekatan yang dapat mengurangkan sebahagian daripada kekangan tersebut. Antara teknologi yang semakin mendapat perhatian ialah Realiti Maya (VR), yang menyediakan persekitaran pembelajaran berasaskan visual, interaktif dan simulasi. Ciri ini menjadikan VR relevan dalam pendidikan murid bermasalah pendengaran kerana penyampaian maklumat tidak bergantung sepenuhnya pada input auditori. Dalam pendidikan, pengalaman tiga dimensi dan interaktif yang disediakan oleh VR berpotensi membantu murid membina gambaran yang lebih konkrit terhadap konsep abstrak serta meningkatkan penglibatan mereka dalam aktiviti pembelajaran (Abdul Majid et al., 2018; Safar & Abdul Raman, 2021). Kajian berkaitan teknologi imersif juga menunjukkan potensi VR dalam meningkatkan motivasi dan penglibatan melalui pengalaman pembelajaran yang lebih aktif dan berasaskan pengalaman (Abdullah et al., 2021; Lin et al., 2024; Yusoff et al., 2021). Dalam pendidikan khas, penggunaan VR dan realiti terimbuh (AR) turut mula diterokai bagi menyokong pembelajaran konsep yang kompleks, termasuk dalam Matematik (Chong et al., 2025). Walaupun demikian, penerapan teknologi imersif dalam pendidikan masih berhadapan dengan kekangan kos, infrastruktur, kebolehgunaan dan kesediaan guru untuk mengintegrasikannya dalam pengajaran (Chin & Osman, 2025; Ghani et al., 2022; Rahim & Abdul Ghani, 2022).

Relevansi VR terhadap pendidikan murid bermasalah pendengaran dapat diperjelas melalui pendekatan pedagogi yang menekankan pembelajaran aktif, pengalaman dan kebolehcapaian. Dari perspektif konstruktivisme, pembelajaran berlaku melalui proses pembinaan pengetahuan berdasarkan pengalaman dan interaksi dengan persekitaran (Jonassen, 1991; Piaget, 1972; Vygotsky, 1978). VR menyediakan ruang untuk murid meneroka, memanipulasi dan mengalami situasi pembelajaran dalam persekitaran simulasi, sekali gus memberi peluang kepada pembinaan makna secara aktif dan kontekstual. Pendekatan ini turut selari dengan prinsip Universal Design for Learning (UDL), khususnya penyediaan pelbagai bentuk representasi dan penglibatan dalam pembelajaran (Meyer et al., 2014). Dalam konteks murid bermasalah pendengaran, ciri seperti visualisasi, teks, kapsyen, avatar bahasa isyarat dan interaksi berasaskan gerakan berpotensi memperluas akses kepada kandungan pembelajaran. Bukti terdahulu menunjukkan bahawa pembelajaran berasaskan VR boleh menyokong motivasi, penglibatan dan pengekalan pengetahuan, khususnya apabila pengalaman imersif digunakan untuk menghubungkan kandungan dengan situasi yang bermakna (Freina & Ott, 2015; Radianti et al., 2020). VR juga berpotensi menyokong pembelajaran *embodied* dan menyediakan ruang simulasi untuk latihan sosial serta komunikasi yang boleh dilakukan secara terkawal dan berulang (Parmaxi, 2020; Poobrasert & Cercone, 2008).

Walaupun potensi tersebut semakin mendapat perhatian, penggunaan VR dalam pendidikan murid bermasalah pendengaran masih berhadapan dengan beberapa persoalan yang belum diselesaikan. Dari aspek teknologi, isu kos pembangunan, keperluan peralatan dan infrastruktur, kebolehgunaan serta *motion sickness* boleh mempengaruhi kebolehlaksanaan penggunaannya (Freina & Ott, 2015; Radianti et al., 2020). Dari sudut pedagogi pula, keberadaan teknologi semata-mata tidak menjamin peningkatan pembelajaran sekiranya reka bentuk pengalaman VR tidak disepadukan dengan objektif, kandungan dan strategi pengajaran yang sesuai. Dalam konteks pendidikan khas, kesediaan dan kompetensi guru juga menjadi faktor penting kerana keberkesanan teknologi bergantung pada keupayaan pendidik mengintegrasikan teknologi tersebut dalam amalan pengajaran sebenar (Ghani et al., 2022; Rahim & Abdul Ghani, 2022). Oleh itu, penelitian terhadap VR perlu melangkaui persoalan kebolehgunaan atau penerimaan teknologi dan turut mempertimbangkan bagaimana teknologi tersebut digunakan untuk mencapai hasil pembelajaran yang khusus.

Literatur sedia ada juga menunjukkan bahawa pengetahuan tentang penggunaan VR dalam pendidikan murid bermasalah pendengaran masih tersebar merentasi pelbagai fokus kajian. Sebahagian kajian menumpukan aspek kognitif dan akademik seperti pemerolehan bahasa, kosa kata dan kefahaman konsep, manakala kajian lain memberi perhatian kepada

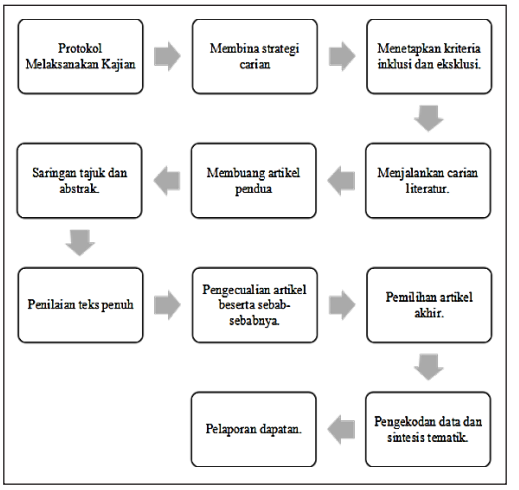
motivasi, penglibatan, kemahiran sosial atau kebolehgunaan teknologi (Knoors & Marschark, 2014; Mayer & Trezek, 2018; Parmaxi, 2020). Tumpuan yang terpisah ini menyebabkan gambaran menyeluruh tentang perkembangan bidang, perubahan fokus kajian dan arah penggunaan VR dalam pedagogi masih belum jelas. Pada masa yang sama, kajian terdahulu berbeza dari segi reka bentuk, konteks pendidikan, populasi, ciri teknologi dan ukuran hasil pembelajaran. Perbezaan tersebut menyukarkan perbandingan dapatan dan pembentukan kesimpulan yang lebih mantap tentang kedudukan VR dalam pendidikan murid bermasalah pendengaran.

Justeru, terdapat keperluan untuk mensintesis literatur secara sistematik bagi memahami bagaimana bidang ini berkembang, apakah tema yang menjadi tumpuan kajian dan aspek manakah yang masih kurang diterokai. Sintesis sedemikian penting bukan sahaja untuk mengenal pasti potensi VR sebagai teknologi sokongan, tetapi juga untuk menentukan sejauh mana kajian sedia ada telah bergerak daripada pembangunan teknologi kepada integrasi pedagogi dalam konteks pendidikan sebenar. Sehubungan itu, kajian ini mensintesis kajian berkaitan aplikasi VR dalam pendidikan murid bermasalah pendengaran bagi tempoh 2000 hingga Mei 2026 dengan memberi tumpuan kepada trend penerbitan, lokasi kajian, reka bentuk kajian, kaedah statistik, perkembangan tema dan jurang kajian. Pendekatan ini diharapkan dapat memberikan gambaran yang lebih tersusun tentang perkembangan bidang serta menyediakan asas berasaskan bukti untuk kajian dan amalan pedagogi VR yang lebih inklusif.

METODOLOGI KAJIAN

Kajian ini menggunakan reka bentuk sorotan literatur sistematik (*systematic literature review*-SLR) yang bertujuan untuk mengenal pasti, menilai dan mensintesis kajian terdahulu secara sistematik dalam bidang yang dikaji (Booth et al., 2012; Feak & Swales, 2009). Pendekatan ini melibatkan proses pencarian literatur yang terancang, diikuti dengan saringan kajian berdasarkan kriteria inklusi dan eksklusi yang telah ditetapkan, serta analisis terstruktur terhadap kajian terpilih (Fink, 2014). Rajah 1 memaparkan protokol dalam melaksanakan kajian.

Berdasarkan Rajah 1 terdapat beberapa langkah utama, iaitu penetapan protokol, carian literatur, pemilihan kajian, pengekstrakan data, analisis dan pelaporan dapatan.



Rajah 1. Protokol melaksanakan kajian

Penetapan Protokol dan Carian Literatur

Kajian dimulakan dengan menetapkan objektif, persoalan kajian, skop, tempoh penerbitan, sumber maklumat serta kaedah carian dan analisis. Kata kunci seperti *"immersive technology"*, *"virtual reality"*, *"hearing impairment"*, *"deaf education"*, *"pedagogy"* dan *"special education"* digunakan dan digabungkan dengan operator Boolean **AND** dan **OR**. Carian dilakukan melalui Scopus, Web of Science, ERIC, Google Scholar dan IEEE Xplore bagi mendapatkan literatur yang berkaitan secara menyeluruh (Carrera-Rivera et al., 2022; Pati & Lorusso, 2018).

Pemilihan Kajian

Kriteria inklusi dan eksklusi ditetapkan berdasarkan jenis dokumen, bahasa, tempoh penerbitan, kumpulan sasaran, penggunaan VR dan kaitannya dengan pedagogi murid bermasalah pendengaran (Xiao & Watson, 2019). Semua rekod yang diperoleh dikumpulkan dan artikel pendua dikeluarkan. Artikel kemudiannya disaring berdasarkan tajuk dan abstrak sebelum teks penuh dinilai. Proses pengenalpastian, saringan, penilaian kelayakan dan pemilihan kajian dilakukan berdasarkan prinsip PRISMA bagi memastikan proses tersebut jelas dan telus (Moher et al., 2009; Page et al., 2021).

Pengekstrakan dan Analisis Data

Maklumat daripada kajian yang terpilih diekstrak berdasarkan tahun penerbitan, lokasi, reka bentuk kajian, populasi, jenis teknologi VR, tujuan penggunaan, kaedah pengumpulan data dan dapatan utama. Data tersebut kemudiannya dianalisis menggunakan analisis deskriptif dan tematik bagi mengenal pasti trend, pola dan tema utama dalam kajian VR untuk murid bermasalah pendengaran (Booth et al., 2016; Donthu et al., 2021). Analisis tematik digunakan untuk mengelompokkan dapatan berdasarkan tema yang muncul daripada kajian terpilih (Braun & Clarke, 2006; Byrne, 2022; Cooper et al., 2022). Perkembangan penggunaan VR dalam pendidikan turut dilihat berdasarkan perkembangan teknologi realiti maya dalam bidang pendidikan (Al Farsi et al., 2021; Christou, 2010; Cipresso et al., 2018).

Sintesis dan Pelaporan Dapatan

Pada peringkat akhir, dapatan disusun berdasarkan objektif dan persoalan kajian. Analisis memberi tumpuan kepada trend penerbitan, reka bentuk dan kaedah analisis, tema penggunaan VR serta jurang kajian dari aspek teknologi, pedagogi, metodologi dan pelaksanaan. Dapatan kemudiannya dilaporkan secara sistematik untuk memberikan gambaran tentang perkembangan kajian VR dalam pedagogi murid bermasalah pendengaran (Page et al., 2021; Xiao & Watson, 2019).

Secara keseluruhannya, SLR digunakan untuk mengenal pasti dan menganalisis kajian berkaitan penggunaan VR dalam pedagogi murid bermasalah pendengaran secara sistematik. Proses carian, pemilihan, pengekstrakan dan analisis data membantu mengenal pasti trend, tema utama dan jurang

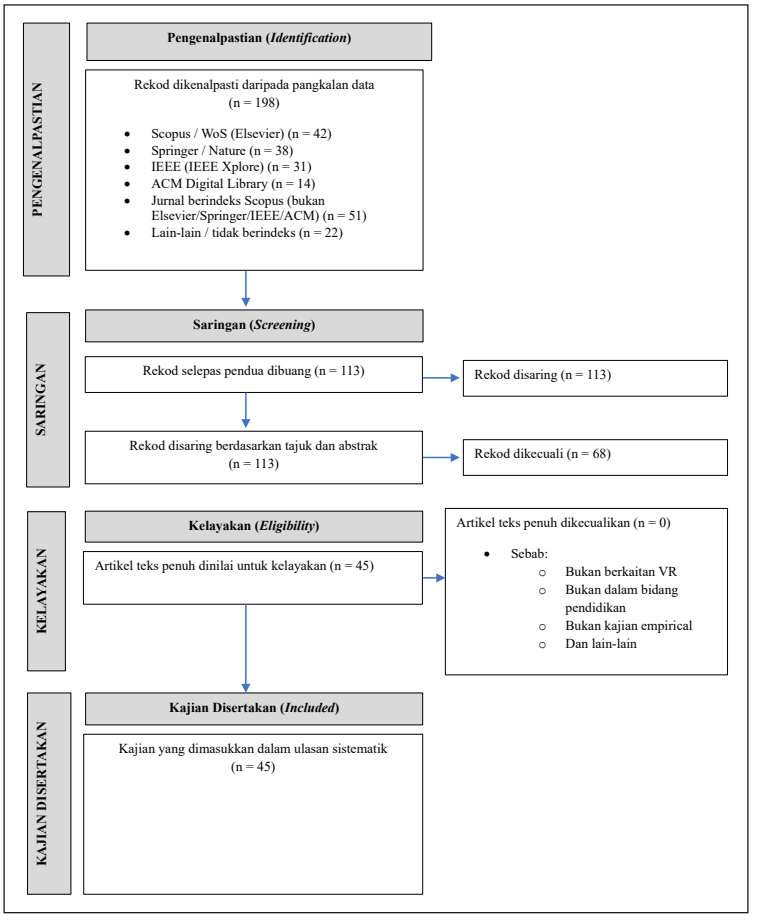
kajian dalam bidang ini (Booth et al., 2016; Xiao & Watson, 2019; Page et al., 2021).

DAPATAN KAJIAN

Bahagian ini membentangkan dapatan kajian berdasarkan proses pemilihan kajian serta tiga objektif utama, iaitu: (1) menganalisis trend penerbitan berdasarkan tahun, lokasi kajian, reka bentuk kajian dan kaedah statistik; (2) mengenal pasti tema utama berkaitan penggunaan VR dalam pedagogi murid bermasalah pendengaran; dan (3) mengenal pasti jurang kajian dari aspek teknologi, pedagogi, metodologi dan pelaksanaan.

Proses Pemilihan Kajian

Proses pemilihan kajian dijalankan berdasarkan garis panduan PRISMA 2020 yang merangkumi peringkat pengenalpastian, saringan, kelayakan dan pemilihan seperti yang ditunjukkan dalam Rajah 2. Kerangka ini membantu memastikan proses pemilihan kajian dilaporkan secara sistematik dan telus.



Rajah 2. Prosedur saringan kajian mengikut garis panduan PRISMA 2020

Proses pencarian dan pemilihan kajian dilaksanakan secara sistematik melalui beberapa pangkalan data akademik bagi memperoleh liputan literatur yang luas dan relevan dengan fokus kajian. Penggunaan pelbagai sumber pencarian membantu meningkatkan keluasan carian dan mengurangkan kemungkinan kajian berkaitan terlepas daripada proses pengenalpastian. Rekod yang diperoleh kemudiannya disaring secara berperingkat berdasarkan kriteria inklusi dan eksklusi yang telah ditetapkan, dengan penekanan terhadap kesesuaian populasi, intervensi, konteks pendidikan dan reka bentuk kajian. Pada peringkat penilaian teks penuh, perhatian khusus diberikan kepada kajian yang benar-benar melibatkan penggunaan realiti maya (VR) dalam pendidikan murid bermasalah pendengaran agar hanya bukti yang relevan dikekalkan untuk sintesis. Proses saringan yang terperinci ini memastikan kajian yang dipilih mempunyai keselarasan yang jelas dengan persoalan dan objektif kajian. Walaupun demikian, jumlah kajian yang akhirnya diperoleh menunjukkan bahawa kajian mengenai aplikasi VR dalam pendidikan murid bermasalah pendengaran masih agak terhad. Keadaan ini mungkin berkait dengan skop kriteria pemilihan yang khusus, liputan pangkalan data yang tidak menyeluruh, batasan bahasa penerbitan serta kesukaran mendapatkan teks penuh bagi sesetengah kajian.

1. Trend Penerbitan

Bahagian ini membentangkan analisis bagi objektif pertama, iaitu mengenal pasti trend penerbitan kajian berkaitan penggunaan VR dalam pendidikan murid bermasalah pendengaran dari tahun 2000 hingga 2026. Analisis merangkumi empat aspek utama, iaitu; (i) lokasi kajian, (ii) trend penerbitan, (iii) reka bentuk kajian dan (iv) kaedah analisis. Pemilihan keempat-empat aspek ini bertujuan memberikan gambaran yang menyeluruh tentang perkembangan bidang, konteks kajian, pendekatan metodologi dan kekuatan evidens yang dihasilkan.

Lokasi Kajian

Dalam analisis kajian ini, lokasi kajian merujuk kepada asal-usul kajian yang menggunakan Realiti Maya (Virtual Reality, VR) dalam pendidikan murid bermasalah pendengaran bagi tempoh 2000 hingga Mei 2026, sepertimana yang ditunjukkan dalam Jadual 1.

Analisis taburan kajian menunjukkan perubahan fokus penyelidikan daripada penerokaan awal teknologi kepada penggunaan VR yang lebih pelbagai dalam pendidikan murid bermasalah pendengaran. Pada peringkat awal, kajian lebih menekankan potensi dan penggunaan asas teknologi, manakala kajian yang lebih terkini memberi perhatian kepada aplikasi VR dalam pembelajaran serta keperluan khusus murid. Perubahan ini menunjukkan bahawa penyelidikan semakin bergerak daripada aspek teknologi semata-mata kepada persoalan penggunaannya dalam pendidikan dan pembelajaran. Di Malaysia, kajian yang dikenal pasti turut memperlihatkan minat terhadap pembangunan aplikasi dan persekitaran pembelajaran imersif untuk murid bermasalah pendengaran. Namun,

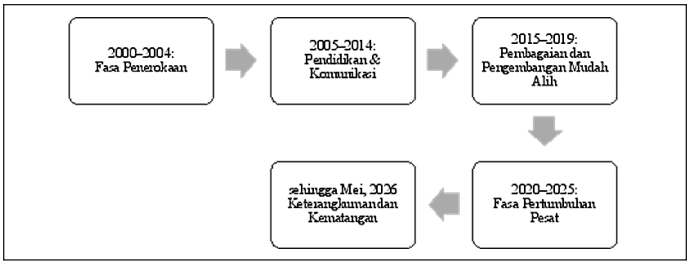
skop penyelidikan tempatan masih lebih terhad berbanding kajian antarabangsa, terutama dari segi kepelbagaian aplikasi dan penilaian keberkesanan. Oleh itu, penyelidikan seterusnya perlu memberi lebih perhatian kepada penggunaan VR dalam konteks pendidikan sebenar, termasuk keberkesanan pembelajaran dan kesesuaian teknologi dengan keperluan murid.

Trend Penerbitan

Dalam analisis kajian ini, evolusi merujuk kepada proses perubahan dan perkembangan sesuatu bidang kajian dari masa ke masa, manakala trend merujuk kepada pola atau arah aliran yang konsisten dalam penerbitan atau dapatan kajian, sepertimana yang ditunjukkan dalam Rajah 3.

Jadual 1
Penerbitan artikel berdasarkan lokasi kajian

Bil.	Tempoh Tahun	Kajian / Penulis Utama	Lokasi Kajian
1	2000-2004	Passig & Eden (2000a, 2000b, 2001, 2003); Vogel et al. (2004)	Timur Tengah, Jerman
2	2005-2009	Eden (2008); Poobrasert & Cercone (2008)	Timur Tengah, Kanada
3	2010-2014	Brega et al. (2014); Cadeñanes Garnica & Arrieta (2014); Eden (2014); Ingber & Eden (2011a, 2011b); Liu et al. (2013); Luo et al. (2012); Mirzaei et al. (2012); Passig & Eden (2010)	Timur Tengah, China, Timur Tengah, Sepanyol, Amerika Syarikat
4	2015-2019	Glasser et al. (2019); Kožuh et al. (2015); Sudana et al. (2016); Teófilo et al. (2018)	Slovenia, Indonesia, Brazil, Amerika Syarikat
5	2020-2024	Abdullah et al. (2024); Al Farsi et al. (2021); Al-Mohimeed et al. (2022); Al Obeidi & Mohamad Ali (2024); Aljedaani et al. (2023); Alsadoon & Turkestani (2020); Chaves et al. (2021); El Ghoul & Othman (2022); Fernández-Gavira et al. (2021); Gunarhadi et al. (2024); Hasanah et al. (2020); Ito & Ichimiya (2024); Kepp et al. (2022); Kwak et al. (2022); Melo et al. (2023); Mirzaei et al. (2020); Nebytova et al. (2021); Rahim & Abdul Rahim (2022); Rho et al. (2020); Serafin et al. (2023); Taylor & Yuknis (2023); Teófilo et al. (2018); Tukpah et al. (2023); Ubur (2024); Yang et al. (2022)	Timur Tengah, Oman, UAE, Sepanyol, Perancis, Korea, Jepun, China, Indonesia, Malaysia, Amerika Syarikat
6	2025-Mei 2026	González Afonso et al. (2025)	Sepanyol



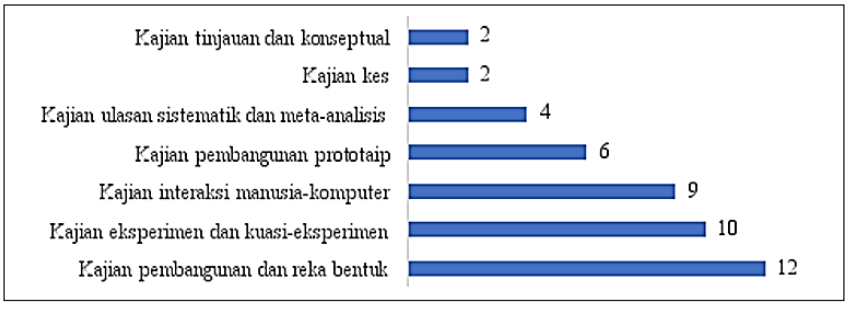
Rajah 3. Trend penerbitan

Rajah 3 menunjukkan perubahan fokus kajian berkaitan penggunaan *Virtual Reality* (VR) dalam pendidikan murid bermasalah pendengaran dari semasa ke semasa. Pada peringkat awal, kajian lebih tertumpu kepada penerokaan potensi VR sebagai teknologi baharu dan medium sokongan dalam pembelajaran. Fokus tersebut kemudiannya berkembang kepada aspek pendidikan dan komunikasi, khususnya penggunaan VR untuk menyokong interaksi serta mewujudkan pengalaman pembelajaran yang lebih sesuai dengan keperluan murid. Perkembangan peranti dan persekitaran digital turut memperluas penggunaannya dalam pelbagai aktiviti pembelajaran. Dalam kajian yang lebih terkini, perhatian semakin tertumpu kepada pengalaman pembelajaran imersif, interaksi multimodal, kebolehcapaian dan keterangkuman. Perubahan ini memperlihatkan peralihan fokus daripada penerokaan potensi teknologi kepada usaha memahami penggunaannya dalam menyokong proses dan keperluan pembelajaran murid bermasalah pendengaran. Secara keseluruhannya, perkembangan tersebut menunjukkan bahawa kajian dalam bidang ini semakin meluas, dengan aspek pedagogi, pengalaman pengguna dan keterangkuman semakin mendapat perhatian.

Reka Bentuk Kajian

Dalam analisis kajian ini, reka bentuk kajian merujuk kepada kerangka atau pelan sistematik yang digunakan oleh pengkaji untuk melaksanakan kajian, sepertimana yang ditunjukkan dalam Rajah 4.

Rajah 4 menunjukkan bahawa kajian VR dalam pendidikan murid bermasalah pendengaran masih banyak tertumpu pada pembangunan teknologi, pengujian dan pengalaman pengguna. Tumpuan ini memperlihatkan bahawa pengkaji lebih banyak meneliti aspek pembangunan teknologi, keberkesanan penggunaannya serta cara murid berinteraksi dengan teknologi tersebut. Sebaliknya, kajian yang membincangkan aspek konseptual, konteks penggunaan dan pengalaman pembelajaran dalam situasi sebenar masih terhad. Keadaan ini menunjukkan bahawa perkembangan bidang masih dipengaruhi oleh kemajuan teknologi, sedangkan aspek pedagogi seperti cara VR diterapkan dalam pengajaran, kesesuaiannya dengan



Rajah 4. Reka bentuk kajian

keperluan murid dan pelaksanaannya dalam bilik darjah belum mendapat perhatian yang seimbang. Sehubungan itu, kajian akan datang perlu memperluas tumpuan daripada pembangunan dan pengujian teknologi kepada kajian yang menilai penggunaan VR dalam proses pengajaran dan pembelajaran sebenar.

Kaedah Analisis

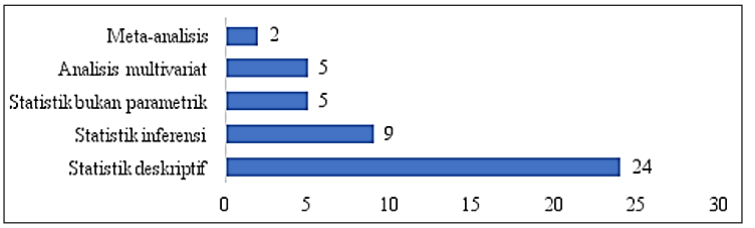
Dalam analisis kajian ini, kaedah analisis merujuk kepada pendekatan atau teknik yang digunakan oleh pengkaji untuk memproses, menilai, dan mentafsir data, sepertimana yang ditunjukkan dalam Rajah 5.

Rajah 5 menunjukkan bahawa penggunaan kaedah statistik dalam kajian yang dianalisis masih banyak tertumpu pada pendekatan asas, khususnya statistik deskriptif. Kaedah ini digunakan untuk menerangkan ciri data, pola respons dan dapatan yang diperoleh. Statistik inferensi pula digunakan dalam sebahagian kajian bagi menguji perbezaan, hubungan atau kesan sesuatu intervensi. Sementara itu, penggunaan analisis multivariat, statistik bukan parametrik dan meta-analisis masih terhad. Keadaan ini menunjukkan bahawa analisis yang melibatkan hubungan antara beberapa pemboleh ubah serta sintesis dapatan merentas kajian masih kurang diberi perhatian. Secara keseluruhannya, pola tersebut memperlihatkan bahawa kajian dalam bidang ini masih cenderung menggunakan analisis deskriptif dan kaedah penilaian asas. Oleh itu, kajian akan datang boleh memperluas penggunaan kaedah statistik yang lebih pelbagai dan sesuai dengan persoalan kajian bagi mendapatkan gambaran yang lebih mendalam tentang keberkesanan penggunaan VR dalam pendidikan murid bermasalah pendengaran.

2. Tematik Kajian

Bahagian ini membentangkan analisis bagi objektif kedua iaitu; mengenal pasti tema utama berkaitan penggunaan VR dalam pedagogi murid bermasalah pendengaran. Dalam analisis kajian ini, trend tematik merujuk kepada pola atau arah aliran tema kajian yang muncul secara konsisten dalam literatur, sepertimana yang ditunjukkan dalam Jadual 2.

Jadual 2 menunjukkan enam tema utama dalam kajian VR bagi murid bermasalah pendengaran, iaitu kebolehcapaian dan keterangkuman; pengecaman bahasa isyarat dan avatar AI; perkembangan kognitif dan pembelajaran bahasa; gamifikasi dan pembelajaran berasaskan pengalaman;



Rajah 5. Kaedah analisis

realiti campuran dan interaksi multimodal; serta penerimaan teknologi dan reka bentuk inklusif. Secara keseluruhannya, tema-tema ini menunjukkan bahawa penggunaan VR bukan sahaja berkaitan dengan peningkatan akses kepada pembelajaran, tetapi turut merangkumi sokongan terhadap komunikasi bahasa isyarat, perkembangan bahasa dan kognitif serta penyediaan pengalaman pembelajaran yang lebih interaktif. Perkembangan teknologi seperti AI, avatar digital, VR dan AR turut memperluas penggunaannya dalam memenuhi keperluan murid bermasalah pendengaran. Walau bagaimanapun, kajian yang dianalisis masih lebih banyak menumpukan aspek teknologi, kebolehgunaan dan pengalaman pengguna, manakala penerapan VR dalam amalan pengajaran sebenar masih kurang diberi perhatian. Keadaan ini menunjukkan keperluan untuk memperkukuh kajian berkaitan integrasi VR dalam pedagogi, khususnya dari segi peranan guru, kesesuaian aktiviti dengan keperluan murid dan kesannya terhadap hasil pembelajaran.

3. Jurang Kajian

Bahagian ini membentangkan analisis bagi objektif ketiga iaitu; mengenal pasti jurang kajian dari aspek teknologi, pedagogi, metodologi dan pelaksanaan. Dalam analisis kajian ini, jurang kajian merujuk kepada aspek atau isu yang belum diterokai secara menyeluruh oleh pengkaji terdahulu, sepertimana yang ditunjukkan dalam Jadual 3.

Jadual 2
Trend tematik kajian murid masalah pendengaran

	Tema	Fokus Utama
1.	Kebolehcapaian dan keterangkuman	VR/AR, avatar bahasa isyarat dan persekitaran imersif
2.	Bahasa isyarat dan avatar AI	Pengecaman dan terjemahan bahasa isyarat
3.	Kognitif dan pembelajaran bahasa	Pemerolehan bahasa dan kemahiran kognitif
4.	Gamifikasi dan pembelajaran pengalaman	Permainan dan simulasi VR
5.	Realiti campuran dan interaksi multimodal	Interaksi visual, haptik dan realiti campuran
6.	Penerimaan teknologi dan reka bentuk inklusif	TAM, UDL dan reka bentuk berpusatkan pengguna

Jadual 3
Jurang kajian pengaplikasian VR dalam kajian murid masalah pendengaran

	Tema	Jurang Kajian
1.	Kematangan Teknologi	Kajian kecil dan dapatan tidak konsisten.
2.	Penilaian Impak VR	Tiada penilaian standard dan kajian jangka panjang terhad.
3.	Integrasi Pedagogi	Kurang integrasi VR dalam bilik darjah sebenar.
4.	Konteks dan Pendidikan	Kepelbagaian lokasi, budaya, bahasa dan tahap pendidikan kurang diterokai.
5.	Pembangunan Holistik	Aspek sosioemosi dan sosial kurang diberi perhatian.

Jadual 3 memperlihatkan bahawa jurang penyelidikan dalam pengaplikasian VR untuk murid bermasalah pendengaran bukan hanya berkaitan dengan teknologi, tetapi turut melibatkan aspek pedagogi, metodologi dan pelaksanaan. Secara umum, kajian sedia ada masih lebih berorientasikan pembangunan teknologi berbanding penggunaannya sebagai sebahagian daripada proses pengajaran dan pembelajaran. Keadaan ini menunjukkan bahawa aspek seperti bahasa isyarat, interaksi multimodal, aksesibiliti dan kesesuaian teknologi dengan keperluan murid perlu diberi perhatian yang lebih besar dalam penyelidikan akan datang. Dari sudut pedagogi, masih terdapat keperluan untuk memahami bagaimana VR dapat diintegrasikan dengan kandungan kurikulum, strategi pengajaran dan aktiviti pembelajaran secara bermakna.

Dari aspek metodologi, keterbatasan saiz sampel, tempoh intervensi dan ketidakseragaman instrumen serta ukuran hasil menyebabkan kekuatan bukti tentang keberkesanan VR masih terhad dan sukar dibandingkan merentas kajian. Pada masa yang sama, kurangnya kajian dalam konteks sekolah sebenar mengehadkan pemahaman tentang faktor yang mempengaruhi pelaksanaan, termasuk kesediaan guru, kemudahan, sokongan teknikal, kos dan kelestarian penggunaan teknologi. Kepelbagaian konteks pendidikan, bahasa dan tahap persekolahan juga masih kurang diberi perhatian, manakala hasil pembelajaran bukan akademik seperti perkembangan sosial, emosi dan keterangkuman belum diterokai secara meluas. Oleh itu, penyelidikan masa hadapan perlu bergerak daripada penilaian teknologi secara berasingan kepada pendekatan yang menghubungkan teknologi, pedagogi, metodologi dan konteks pelaksanaan. Pendekatan sedemikian dapat menghasilkan bukti yang lebih kukuh tentang keberkesanan, kebolehlaksanaan dan kesesuaian VR dalam menyokong pendidikan murid bermasalah pendengaran.

PERBINCANGAN

Dapatan SLR menunjukkan bahawa penggunaan VR dalam pendidikan murid bermasalah pendengaran berkembang seiring dengan kemajuan teknologi, daripada simulasi dan persekitaran maya asas kepada penggunaan AR, MR, AI, pengecaman bahasa isyarat dan interaksi multimodal. Walaupun perkembangan ini memperluas potensi VR dalam pendidikan, kemajuan teknologi belum diikuti secara seimbang oleh perkembangan dari aspek pedagogi, metodologi dan pelaksanaan dalam konteks pendidikan sebenar. Oleh itu, perbincangan ini meneliti perkembangan teknologi dan perubahan fokus kajian, reka bentuk pedagogi dan asas teori, pola metodologi, pelaksanaan VR, perbezaan konteks Malaysia dan antarabangsa serta implikasinya terhadap penyelidikan akan datang.

Perkembangan Teknologi dan Peralihan Fokus Kajian

Perkembangan kajian dari tahun 2000 hingga Mei 2026 menunjukkan perubahan daripada penggunaan teknologi VR asas

kepada teknologi yang lebih kompleks seperti AR, MR dan AI. Perkembangan ini menyediakan peluang untuk mewujudkan pengalaman pembelajaran yang lebih interaktif, visual dan imersif (Di Natale et al., 2020; Radianti et al., 2020). Dalam pendidikan murid bermasalah pendengaran, perkembangan tersebut turut melibatkan avatar, bahasa isyarat, pengecaman gerak isyarat dan interaksi multimodal yang lebih selaras dengan keperluan komunikasi visual murid (Berrezueta-Guzman et al., 2025; Zirzow, 2015).

Walau bagaimanapun, kemajuan teknologi tidak semestinya menunjukkan peningkatan yang sama dalam hasil pembelajaran. Sebahagian besar kajian masih menumpukan pembangunan sistem, kebolehgunaan dan pengalaman pengguna berbanding penilaian keberkesanan pembelajaran yang konsisten (Hamilton et al., 2021). Keadaan ini menunjukkan bahawa fokus penyelidikan perlu beralih daripada kecanggihan teknologi kepada fungsi pedagoginya. Penilaian VR perlu memberi perhatian kepada sejauh mana teknologi tersebut menyokong kandungan pembelajaran, strategi pengajaran dan keperluan komunikasi murid, termasuk penggunaan bahasa isyarat, teks, avatar dan bentuk interaksi yang sesuai (Radianti et al., 2020; UNESCO, 2020; Zirzow, 2015).

Reka Bentuk Pedagogi dan Asas Teori

Keberkesanan VR bukan hanya bergantung pada tahap imersi dan interaktiviti, tetapi juga pada cara pengalaman pembelajaran direka bentuk. Kandungan, aktiviti, arahan, maklum balas dan hasil pembelajaran perlu disusun secara jelas kerana pengalaman yang menarik tidak semestinya menghasilkan pembelajaran yang lebih berkesan (Radianti et al., 2020; Hamilton et al., 2021). Dalam konteks ini, Teori Beban Kognitif dan prinsip pembelajaran multimedia dapat membantu memastikan maklumat disampaikan secara teratur tanpa menambah beban pemprosesan kognitif murid (Mayer, 2009; Mayer & Moreno, 2003; Sweller, 2011).

Bagi murid bermasalah pendengaran, prinsip tersebut perlu disesuaikan dengan keperluan visual dan bahasa melalui penggunaan teks, bahasa isyarat, avatar dan interaksi yang mudah difahami (Zirzow, 2015). Namun, penggunaan teori dalam kajian VR masih belum konsisten, khususnya dalam menghubungkan teori pembelajaran dengan reka bentuk aktiviti dan penilaian hasil pembelajaran (Hamilton et al., 2021). Oleh itu, penyelidikan akan datang perlu menghubungkan teori pembelajaran, reka bentuk pengajaran dan ciri teknologi secara lebih jelas supaya VR tidak hanya berfungsi sebagai alat teknologi, tetapi sebagai persekitaran pembelajaran yang mempunyai asas pedagogi yang kukuh.

Pola Metodologi dan Kekuatan Bukti

Pola metodologi menunjukkan bahawa kajian VR untuk murid bermasalah pendengaran masih banyak tertumpu pada pembangunan teknologi, pengujian prototaip, kebolehgunaan dan pengalaman pengguna. Walaupun aspek tersebut penting dalam peringkat awal pembangunan teknologi, kebolehgunaan sahaja

belum mencukupi untuk membuktikan keberkesanan pembelajaran. Oleh itu, kajian eksperimen dan kuasi-eksperimen perlu diperluas bagi menghasilkan bukti yang lebih jelas tentang kesan VR terhadap hasil pembelajaran (Creswell, 2014; Creswell & Creswell, 2018a). Kaedah campuran juga boleh digunakan untuk menggabungkan data pencapaian murid dengan pengalaman pengguna dan pandangan guru (Creswell et al., 2018b).

Dari segi analisis data, penggunaan statistik deskriptif dan inferensi perlu disesuaikan dengan persoalan kajian, jenis data dan saiz sampel (Field, 2024; Hair et al., 2019; Tabachnick & Fidell, 2019). Analisis yang lebih kompleks pula wajar digunakan apabila reka bentuk kajian dan ciri data menyokong penggunaannya (Byrne, 2016; Kline, 2016). Perbezaan instrumen, sampel, reka bentuk dan ukuran hasil antara kajian turut menyukarkan perbandingan dapatan dan sintesis yang lebih kukuh, termasuk melalui meta-analisis (Petticrew & Roberts, 2006; Xiao & Watson, 2019). Justeru, keutamaan penyelidikan bukan semata-mata meningkatkan kerumitan analisis statistik, tetapi memperkukuh reka bentuk kajian, instrumen dan ukuran hasil agar dapatan dapat dibandingkan dengan lebih konsisten.

Pelaksanaan VR Dalam Pendidikan Sebenar

Walaupun teknologi VR semakin berkembang, penggunaannya dalam pengajaran dan pembelajaran sebenar masih terhad. Kebanyakan kajian memberi tumpuan kepada pembangunan teknologi, pengujian prototaip dan kebolehgunaan, manakala kajian yang menilai penggunaan VR secara berterusan dalam bilik darjah masih kurang (Radianti et al., 2020; Hamilton et al., 2021). Saiz sampel yang kecil, tempoh intervensi yang singkat serta perbezaan instrumen dan ukuran hasil turut mengehadkan pemahaman tentang keberkesanan VR dalam konteks pendidikan sebenar (Xiao & Watson, 2019).

Bagi murid bermasalah pendengaran, penilaian keberkesanan juga perlu mengambil kira hasil yang lebih luas seperti komunikasi, kemahiran sosial, autonomi, pendidikan vokasional dan kemahiran kehidupan harian (WHO, 2021). Pada masa yang sama, pelaksanaan VR bergantung pada kesediaan guru, latihan, kemudahan peranti, sokongan teknikal, kos dan kesesuaiannya dengan rutin sekolah (UNESCO, 2020). Oleh itu, penyelidikan akan datang perlu bergerak daripada penilaian awal kebolehgunaan kepada penilaian keberkesanan dan kebolehlaksanaan dalam bilik darjah bagi menentukan sama ada manfaat yang dikenal pasti dalam kajian terkawal dapat diterapkan secara praktikal dan berterusan.

Perbandingan Konteks Malaysia dan Antarabangsa

Dapatan SLR menunjukkan bahawa penyelidikan VR dalam pendidikan murid bermasalah pendengaran mempunyai skop yang lebih luas di peringkat antarabangsa berbanding di Malaysia. Kajian antarabangsa merangkumi bahasa isyarat, komunikasi, pembelajaran akademik, kemahiran hidup,

latihan dan aksesibiliti (Di Natale et al., 2020; Radianti et al., 2020). Penggunaan avatar bahasa isyarat dan persekitaran maya turut menunjukkan usaha menyesuaikan teknologi dengan keperluan khusus murid bermasalah pendengaran (Zirzow, 2015).

Sebaliknya, kajian Malaysia yang dikenal pasti dalam SLR ini lebih tertumpu kepada Bahasa Isyarat Malaysia (BIM), kandungan akademik tertentu, pembangunan avatar dan persekitaran *metaverse*. Corak ini menunjukkan bahawa penyelidikan tempatan masih mempunyai ruang untuk berkembang daripada pembangunan teknologi kepada penilaian keberkesanan dan kebolehlaksanaan dalam konteks pendidikan sebenar. Kajian eksperimen, kuasi-eksperimen, longitudinal dan kaedah campuran boleh diperluas untuk menghasilkan bukti yang lebih kukuh. Pada masa yang sama, pembangunan VR perlu mengambil kira BIM, kurikulum, kemahiran guru, kemudahan sekolah dan keperluan murid. Pendekatan *Universal Design for Learning* (UDL) juga boleh dipertimbangkan bagi menyediakan pelbagai bentuk representasi, interaksi dan penglibatan dalam pembelajaran (CAST, 2024).

Arah Kajian Masa Hadapan

Secara keseluruhannya, dapatan menunjukkan bahawa penyelidikan VR untuk murid bermasalah pendengaran telah mencapai perkembangan yang ketara dari segi teknologi, tetapi bukti tentang keberkesanan pedagoginya masih terhad. Peralihan daripada pembangunan teknologi kepada penyelidikan yang lebih berasaskan teori, reka bentuk eksperimen atau kaedah campuran, penilaian jangka panjang dan pelaksanaan dalam bilik darjah sebenar merupakan keperluan utama. Pada masa yang sama, aspek bahasa isyarat, akses visual, komunikasi dan konteks tempatan perlu diintegrasikan dalam reka bentuk VR.

Dalam konteks Malaysia, penyelidikan masa hadapan perlu memberi perhatian kepada pembangunan VR yang selaras dengan BIM, kurikulum dan keperluan sekolah serta menilai keberkesanannya dalam situasi pendidikan sebenar. Secara lebih luas, kejayaan VR tidak seharusnya ditentukan berdasarkan kecanggihan teknologi semata-mata, tetapi berdasarkan keupayaannya menyokong pembelajaran yang berkesan, inklusif dan berterusan. Pendekatan ini penting bagi memastikan perkembangan teknologi VR dapat diterjemahkan kepada manfaat pedagogi yang nyata untuk murid bermasalah pendengaran.

RUMUSAN

Kajian ini merupakan satu tinjauan literatur sistematik yang memberi tumpuan kepada aplikasi Realiti Maya (VR) dalam pedagogi pendidikan murid bermasalah pendengaran. Secara keseluruhan, kajian ini mensintesis perkembangan kajian berkaitan penggunaan VR dalam konteks pendidikan khas dengan menekankan aspek pedagogi yang menyokong pembelajaran inklusif, interaktif dan berasaskan pengalaman. Dapatan kajian menunjukkan bahawa VR berpotensi meningkatkan kebolehcapaian,

penglibatan dan pemahaman konsep dalam kalangan murid bermasalah pendengaran melalui persekitaran pembelajaran yang visual, multimodal dan imersif. Namun begitu, kajian turut mendapati bahawa aplikasi VR masih berada pada tahap awal perkembangan, dengan jurang yang ketara dari segi integrasi pedagogi, keselarasan teori pembelajaran, serta pelaksanaan dalam konteks bilik darjah sebenar. Oleh itu, kajian ini menegaskan keperluan untuk memperkukuh asas pedagogi, memperluaskan kajian empirikal jangka panjang, serta membangunkan model pelaksanaan VR yang lebih sistematik dan berasaskan bukti bagi menyokong pendidikan inklusif murid bermasalah pendengaran secara lebih berkesan.

IMPLIKASI KAJIAN

Dapatan SLR ini menunjukkan bahawa penggunaan VR untuk murid bermasalah pendengaran perlu disokong oleh teori pembelajaran dan reka bentuk pedagogi yang jelas. Kandungan, aktiviti dan penilaian perlu disesuaikan dengan keperluan murid melalui penggunaan visual, teks, bahasa isyarat, avatar dan pendekatan UDL. Pada peringkat pelaksanaan, faktor seperti kesediaan guru, latihan, kemudahan peranti, sokongan teknikal dan konteks bilik darjah perlu diberi perhatian. Dalam konteks Malaysia, pembangunan VR juga perlu mengambil kira Bahasa Isyarat Malaysia (BIM), kurikulum dan keperluan murid tempatan. Dari aspek penyelidikan, kajian eksperimen, kaedah campuran dan longitudinal dengan ukuran hasil yang lebih konsisten diperlukan bagi menilai keberkesanan VR secara lebih meyakinkan. Secara keseluruhannya, implikasi ini menunjukkan bahawa perkembangan VR perlu beralih daripada penekanan terhadap kecanggihan teknologi kepada penggunaan yang lebih berasaskan pedagogi, inklusif dan praktikal dalam pendidikan sebenar.

LIMITASI KAJIAN DAN CADANGAN KAJIAN MASA HADAPAN

Kajian ini mempunyai beberapa batasan, antaranya kesukaran mendapatkan artikel penuh, penggunaan pangkalan data dan kata kunci tertentu serta perbezaan reka bentuk kajian, saiz sampel, instrumen dan ukuran hasil yang menyukarkan perbandingan dapatan. Perubahan teknologi VR yang pesat juga menyebabkan sebahagian teknologi yang dilaporkan dalam kajian terdahulu mungkin telah berkembang atau berubah. Keadaan ini menunjukkan keperluan untuk memperluas sumber literatur dan menjalankan kajian eksperimen, kuasi-eksperimen, longitudinal serta kaedah campuran bagi mendapatkan bukti yang lebih kukuh tentang keberkesanan VR. Penggunaan instrumen dan ukuran hasil yang lebih konsisten juga dapat memudahkan perbandingan antara kajian. Dalam konteks Malaysia, kajian seterusnya boleh diperluas kepada bilik darjah sebenar dengan mengambil kira BIM, kurikulum, kemahiran guru, kemudahan sekolah dan keperluan murid. Penggunaan VR dalam pendidikan vokasional, latihan kemahiran dan persediaan ke alam pekerjaan juga

boleh diteroka, termasuk aspek kos dan kelestariannya. Pendekatan ini dapat memberikan gambaran yang lebih jelas tentang keberkesanan dan kebolehlaksanaan VR dalam menyokong pembelajaran murid bermasalah pendengaran.

PENGHARGAAN

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RUJUKAN

Abdul Majid, A. H., Makhtar, M., Wan Shamsuddin, S. N., Said, C. S., & Umar, I. N. (2018). Keperluan pembelajaran berasaskan realiti maya dalam konstruk pemasangan komponen komputer mata pelajaran TMK SPM pendidikan di Malaysia: Satu kajian rintis. *Asian People Journal, 1*(1), 28-44.

Abdullah, A. S., Idris, S. H., & Abd Hamid, Z. Z. (2021). Adoption of virtual reality in Malaysian higher education: A study on students' perceptions and learning outcomes. *Journal of Higher Education Research, 7*(2), 233-247.

Abdullah, Z., Ayub, S. F., Hamzah, N. Z. S., Saifullah, S. S., & Rahim, N. S. (2024). Persepsi pelajar terhadap persekitaran virtual realiti (VR) melalui GeoVR-Xplorer di Kolej Matrikulasi Kelantan. *Journal of Research, Innovation, and Strategies for Education, 1*(3), 55-71. https://doi.org/10.70148/rise.15

Al Farsi, G., Yusof, A. bin M., Romli, A., Tawafak, R. M., Malik, S. I., Jabbar, J., & Rsuli, M. E. B. (2021). A review of virtual reality applications in an educational domain. *International Journal of Interactive Mobile Technologies (iJIM), 15*(22), 99-110. https://doi.org/10.3991/ijim.v15i22.25003

Al Obeidi, S., & Mohamad Ali, A. Z. (2024). Extended technology acceptance model and deaf students' use of virtual reality in education in the United Arab Emirates. *International Journal of Business and Technology Management, 6*(9), 158-165. https://doi.org/10.55057/ijbtm.2024.6.9.15

Aljedaani, W., Krasniqi, R., Aljedaani, S., Mkaouer, M. W., Ludi, S., & Al-Raddah, K. (2023). If online learning works for you, what about deaf students? Emerging challenges of online learning for deaf and hearing-impaired students during COVID-19: A literature review. *Universal Access in the Information Society, 22*(3). https://doi.org/10.1007/s10209-022-00897-5

Al-Mohimeed, B. A., Al-Harbi, H. O., Al-Dubayan, G. S., & Al-Shargabi, A. A. (2022). Dynamic sign language recognition based on real-time videos. *International Journal of Online and Biomedical Engineering, 18*(1). https://doi.org/10.3991/ijoe.v18i01.27581

Alsadoon, E., & Turkestani, M. H. (2020). Virtual classrooms for hearing-impaired students during the coronavirus COVID-19 pandemic. *Revista Românească pentru Educaţie Multidimensională, 12*(1 Sup2), 1-8. https://doi.org/10.18662/rrem/12.1sup2/240

Antia, S. D., Jones, P. B., Reed, S., & Kreimeyer, K. H. (2009). Academic status and progress of deaf and hard of hearing students in general education classrooms. *Journal of Deaf Studies and Deaf Education, 14*(3), 324-343. https://doi.org/10.1093/deafed/enp005

Antia, S. D., Sabers, D. L., & Stinson, M. S. (2020). Inclusive education for deaf and hard-of-hearing

students: An evidence-based review. *Journal of Deaf Studies and Deaf Education, 25*(3), 245-260.

Bat-Chava, Y., & Deignan, E. (2001). Peer relationships of children with cochlear implants. *Journal of Deaf Studies and Deaf Education, 6*(3), 186-199. https://doi.org/10.1093/deafed/6.3.186

Berrezueta-Guzman, S., Daya, R., & Wagner, S. (2025). Virtual reality in sign language education: Opportunities, challenges, and the road ahead. *Frontiers in Virtual Reality, 6*, Article 1625910. https://doi.org/10.3389/frvir.2025.1625910

Booth, A., Papaioannou, D., & Sutton, A. (2012). *Systematic approaches to a successful literature review*. SAGE Publications.

Booth, A., Sutton, A., & Papaioannou, D. (2016). *Systematic approaches to a successful literature review* (2nd ed.). SAGE.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101. https://doi.org/10.1191/1478088706qp063oa

Brega, A. G., et al. (2014). Use of technology in hearing impairment education interventions. *Disability and Rehabilitation: Assistive Technology, 9*(4), 1-10.

Byrne, B. M. (2016). *Structural equation modeling with AMOS: Basic concepts, applications, and programming* (3rd ed.). Routledge.

Byrne, D. (2022). A worked example of Braun and Clarke's approach to reflexive thematic analysis. *Quality & Quantity, 56*, 1391–1412. https://doi.org/10.1007/s11135-021-01182-y

Cadeñanes Garnica, J. J., & Arrieta, M. A. G. (2014). Augmented reality sign language teaching model for deaf children. In S. Omatu et al. (Eds.), *Distributed computing and artificial intelligence* (pp. 290-297). Springer.

Calderon, R., & Naidu, S. (2020). The influence of family variables on language development of deaf children: A longitudinal study. *Child Development, 91*(1), 93-105. https://doi.org/10.1111/cdev.13160

Carrera-Rivera, A., Ochoa, W., Larrinaga, F., & Lasa, G. (2022). How to conduct a systematic literature review: A quick guide for computer science research. *MethodsX, 9*, Article 101895. https://doi.org/10.1016/j.mex.2022.101895

CAST. (2024). *CAST Universal Design for Learning guidelines version 3.0*. CAST.

Chaves, E. M., Braga, P. B. D., Montenegro, Y. F. L., Rodrigues, V. B., Munguba, M. C., & de Albuquerque, V. H. C. (2021). Toc-Tum mini-games: An educational game accessible for deaf culture based on virtual reality. *Expert Systems, 38*(1), Article e12470. https://doi.org/10.1111/exsy.12470

Chin, W. C., & Osman, K. (2025). Persepsi dan halangan guru terhadap penggunaan realiti maya (VR) dalam pembelajaran sains di sekolah rendah. *Malaysian Journal of Social Sciences and Humanities, 10*(1), Article e003187. https://doi.org/10.47405/mjssh.v10i1.3187

Chong, A. P., Wong, K.-T., & Soon, V. K. L. (2025). Teknologi imersif dalam pendidikan matematik murid ketidakupayaan pendengaran: Naratif daripada realiti terimbuh (AR) hingga ke metaverse. *Journal of Research, Innovation and Strategies for Education, 2*(4), 66-82. https://doi.org/10.70148/rise.v2i4.5

Christou, C. (2010). Virtual reality in education. In A. Tzanavari & N. Tsapatsoulis (Eds.), *Affective, interactive and cognitive methods for e-learning design: Creating an optimal education experience* (pp. 228-243). IGI Global. https://doi.org/10.4018/978-1-60566-940-3.ch012

Cipresso, P., Giglioli, I. A. C., Raya, M. A., & Riva, G. (2018). The past, present, and future of virtual and augmented reality research: A network and cluster analysis of the literature. *Frontiers*

in Psychology, 9, Article 2086. https://doi.org/10.3389/fpsyg.2018.02086

Cooper, N., Horne, T., Hayes, G., & Heldreth, C. (2022). A systematic review and thematic analysis of community-collaborative approaches to computing research. *arXiv*. https://doi.org/10.48550/arXiv.2207.04171

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Sage.

Creswell, J. W., & Creswell, J. D. (2018a). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications.

Creswell, J. W., & Plano Clark, V. L. (2018b). *Designing and conducting mixed methods research* (3rd ed.). Sage Publications.

Dalgarno, B., & Lee, M. J. W. (2010). What are the learning affordances of 3-D virtual environments? *British Journal of Educational Technology, 41*(1), 10-32. https://doi.org/10.1111/j.1467-8535.2009.01038.x

Demir, Ü. (2022). Literature review on the use of virtual reality in special education: Current situation and opportunities. *International Journal of Contemporary Approaches in Education, 1*(1), 19-35. https://doi.org/10.29329/ijcae.2022.499.2

Di Natale, A. F., Repetto, C., Riva, G., & Villani, D. (2020). Immersive virtual reality in K–12 and higher education: A 10-year systematic review of empirical research. *British Journal of Educational Technology, 51*(6), 2006-2033. https://doi.org/10.1111/bjet.13030

Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research, 133*, 285-296. https://doi.org/10.1016/j.jbusres.2021.04.070

Eden, S. (2008). The effect of 3D virtual reality on sequential time perception among deaf and hard-of-hearing children. *European Journal of Special Needs Education, 23*(4), 349-363. https://doi.org/10.1080/08856250802387315

Eden, S. (2014). Virtual intervention to improve storytelling ability among deaf and hard-of-hearing children. *European Journal of Special Needs Education, 29*(3), 370-386.

El Ghoul, O., & Othman, A. (2022). Virtual reality for educating sign language using signing avatar: The future of creative learning for deaf students. In *2022 IEEE Global Engineering Education Conference (EDUCON)* (pp. 1269-1274). IEEE. https://doi.org/10.1109/EDUCON52537.2022.9766692

Elias, H., Syed Mustafa, S. M., Roslan, S., & Mohd Noah, S. (2010). Examining potential relationships between flow and motivational forces in Malaysian secondary school students. *Procedia – Social and Behavioral Sciences, 9*, 2042-2046. https://doi.org/10.1016/j.sbspro.2010.12.443

Feak, C. B., & Swales, J. M. (2009). *Telling a research story: Writing a literature review*. University of Michigan Press. https://doi.org/10.3998/mpub.309338

Fernández-Gavira, J., Espada-Goya, P., Alcaraz-Rodríguez, V., & Moscoso-Sánchez, D. (2021). Design of educational tools based on traditional games for the improvement of social and personal skills of primary school students with hearing impairment. *Sustainability, 13*(22), Article 12644. https://doi.org/10.3390/su132212644

Field, A. (2024). *Discovering statistics using IBM SPSS Statistics* (6th ed.). SAGE Publications.

Fink, A. (2014). *Conducting research literature reviews: From the internet to paper* (4th ed.). SAGE Publications.

Fowler, C. (2015). Virtual reality and learning: Where is the pedagogy? *British Journal of Educational Technology, 46*(2), 412-422. https://doi.org/10.1111/bjet.12135

Freina, L., & Ott, M. (2015). A literature review on immersive virtual reality in education. *eLearning & Software for Education, 1*, 133-141. https://doi.org/10.12753/2066-026X-15-020

Geers, A. E., & Nicholas, J. G. (2020). Language outcomes of early-identified children with cochlear implants at 12 to 16 years of age. *Ear and Hearing, 41*(1), 14-27. https://doi.org/10.1097/AUD.0000000000000740

Ghani, A. A., Khalid, Z. H., & Noor, M. A. (2022). Acceptance and adoption of VR technology in technical and vocational education and training (TVET) in Malaysia. *Journal of Technical Education and Training, 14*(1), 15-30.

Glasser, A., Riley, E., Weeks, K., & Kushalnagar, R. (2019). Mixed reality speaker identification as an accessibility tool for deaf and hard-of-hearing users. In *Proceedings of the ACM Symposium on Virtual Reality Software and Technology*.

González Afonso, M. C., Perdomo López, C. Á., Plasencia Carballo, Z., & Pérez Jorge, D. (2025). Inclusive education beyond formal settings: AR and VR as accessibility strategies for deaf and hard-of-hearing individuals. *Frontiers in Education, 10*, Article 1715885. https://doi.org/10.3389/feduc.2025.1715885

Gunarhadi, D., Atnantomi, W., Fadjri, K. A., & Anggrellangi, A. (2024). Virtual reality as a solution: Meeting the needs of deaf students with digital sign language interpreters. *Edelweiss Applied Science and Technology, 8*(5), 1189-1199.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis* (8th ed.). Cengage Learning.

Hall, M. L., Smith, S. T., & Szymanski, C. (2017). Language deprivation syndrome: A possible neurodevelopmental disorder with sociocultural origins. *Societies, 7*(1), Article 9. https://doi.org/10.3390/soc7010009

Hamilton, D., McKechnie, J., Edgerton, E., & Wilson, C. (2021). Immersive virtual reality as a pedagogical tool in education: A systematic literature review of quantitative learning outcomes and experimental design. *Journal of Computers in Education, 8*, 1-32. https://doi.org/10.1007/s40692-020-00169-2

Hasanah, A., Kusumah, Y. S., & Rahmi, K. (2020). Rounding-augmented reality book and smartphone for deaf students in achieving basic competence. *Journal of Physics: Conference Series, 1521*, Article 032064.

Hauser, P. C., O'Hearn, A., McKee, M., Steider, A., & Thew, D. (2010). Deaf epistemology: Deafhood and deafness. *American Annals of the Deaf, 154*(5), 486-492. https://doi.org/10.1353/aad.0.0138

Hew, K. F., & Brush, T. (2007). Integrating technology into K-12 teaching and learning: Current knowledge gaps and recommendations for future research. *Educational Technology Research and Development, 55*(3), 223-252. https://doi.org/10.1007/s11423-006-9022-5

Hew, K. F., & Brush, T. (2019). Integrating technology into K-12 teaching and learning: Current knowledge gaps. *Educational Technology Research and Development, 67*(6), 1-24.

Ingber, S., & Eden, S. (2011a). Educational interventions for deaf learners. *Journal of Deaf Studies and Deaf Education, 16*(3), 1-12.

Ingber, S., & Eden, S. (2011b). Enhancing sequential time perception and storytelling ability among deaf and hard-of-hearing children. *American Annals of the Deaf, 156*(4), 391-401.

Ito, R., & Ichimiya, M. (2024). Use of virtual reality in education for the deaf and hard of hearing: Aiming to visualize teaching and motivate learning. *Konpyutari Riyou Kyouiku, 57*, 22-28. https://doi.org/10.14949/konpyutariyoukyouiku.57.22

Jensen, L., & Konradsen, F. (2018). A review of the use of virtual reality head-mounted displays in education and training. *Education and Information Technologies, 23*, 1515-1529. https://doi.org/10.1007/s10639-017-9676-0

Jonassen, D. H. (1991). Objectivism versus constructivism: Do we need a new philosophical paradigm? *Educational Technology Research and Development, 39*(3), 5-14. https://doi.org/10.1007/BF02296434

Kaplan-Rakowski, R., & Thrasher, T. (2025). The impact of high-immersion virtual reality and interactivity on vocabulary learning. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.4850163

Kepp, N. E., Arrieta, I., Schiøth, C., & Percy-Smith, L. (2022). VR pitch ranking in children with cochlear implants, hearing aids, or normal hearing. *International Journal of Pediatric Otorhinolaryngology, 161*, Article 111241. https://doi.org/10.1016/j.ijporl.2022.111241

Kline, R. B. (2016). *Principles and practice of structural equation modeling* (4th ed.). Guilford Press.

Knoors, H., & Marschark, M. (2014). *Teaching deaf learners: Psychological and developmental foundations*. Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199792023.001.0001

Kožuh, I., et al. (2015). Virtual environments for learning: Usability and interaction design. *Computers in Human Behavior, 51*, 1-10.

Kwak, C., Han, W., & Bahng, J. (2022). Systematic review and meta-analysis of VR in hearing disorders. *Journal of Audiology & Otology, 26*, 169-181. https://doi.org/10.7874/jao.2022.00205

Lin, X. P., Li, B. B., Yao, Z. N., Yang, Z., & Zhang, M. (2024). The impact of virtual reality on student engagement in the classroom: A critical review of the literature. *Frontiers in Psychology, 15*, Article 1360574. https://doi.org/10.3389/fpsyg.2024.1360574

Liu, X. Q., Yan, N., Wang, L., Wu, X. L., & Ng, M. L. (2013). An interactive speech training system with virtual reality articulation for Mandarin-speaking hearing-impaired children. In *IEEE International Conference on Information and Automation (ICIA)* (pp. 1-4). IEEE.

Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). *Intelligence unleashed: An argument for AI in education*. Pearson.

Luckner, J. L., & Bowen, S. K. (2020). Teachers of the deaf and hard of hearing: Essential skills and strategies. *American Annals of the Deaf, 165*(1), 73-85.

Luo, X., Han, M., Liu, T., Chen, W., & Bai, F. (2012). Assistive learning for hearing-impaired college students using mixed reality: Pilot study. In *IEEE International Conference on Virtual Reality and Visualization*.

Makransky, G., & Petersen, G. B. (2021). The cognitive affective model of immersive learning (CAMIL). *Educational Psychology Review, 33*, 937-958. https://doi.org/10.1007/s10648-020-09586-2

Marschark, M., & Knoors, H. (2012). Educating deaf children: Language, cognition, and learning. *Deafness & Education International, 14*(3), 136-160. https://doi.org/10.1179/1557069X12Y.0000000010

Marschark, M., Shaver, D. M., Nagle, K. M., & Newman, L. A. (2015). Predicting the academic achievement of deaf and hard-of-hearing students from individual, household, communication, and educational factors. *Exceptional Children, 81*(3), 350-369. https://doi.org/10.1177/0014402914563700

Marschark, M., Spencer, P. E., Adams, J., & Sapere, P. (2011). Teaching to the strengths and needs of deaf and hard-of-hearing children. *European*

Journal of Special Needs Education, 26(1), 17-23. https://doi.org/10.1080/08856257.2011.543542

Mayer, C., & Trezek, B. J. (2018). Literacy outcomes in deaf students with cochlear implants: Current state of the knowledge. *Journal of Deaf Studies and Deaf Education, 23*(1), 1-16. https://doi.org/10.1093/deafed/enx043

Mayer, R. E. (2009). *Multimedia learning* (2nd ed.). Cambridge University Press.

Mayer, R. E., & Moreno, R. (2003). Nine ways to reduce cognitive load in multimedia learning. *Educational Psychologist, 38*(1), 43-52. https://doi.org/10.1207/S15326985EP3801_6

Melo, R. S., Lemos, A., Delgado, A., Raposo, M. C. F., Ferraz, K. M., & Belian, R. B. (2023). VR-based games to improve balance and gait of children/adolescents with sensorineural hearing loss: Systematic review and meta-analysis. *Sensors, 23*, Article 6601. https://doi.org/10.3390/s23146601

Merchant, Z., et al. (2014). Effectiveness of virtual reality-based instruction. *Computers & Education, 70*, 29-40. https://doi.org/10.1016/j.compedu.2013.07.033

Meyer, A., Rose, D. H., & Gordon, D. (2014). *Universal design for learning: Theory and practice*. CAST.

Mirzaei, M. R., Ghorshi, S., & Mortazavi, M. (2012). Combining AR and speech technologies to help deaf and hard-of-hearing people. In *IEEE Symposium on Virtual and Augmented Reality*.

Mirzaei, M., Kan, P., & Kaufmann, H. (2020). EarVR: Using ear haptics in virtual reality for deaf and hard-of-hearing people. *IEEE Transactions on Visualization and Computer Graphics, 26*(5), 2084-2093. https://doi.org/10.1109/TVCG.2020.2973441

Moher, D., et al. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *PLoS Medicine, 6*(7), Article e1000097. https://doi.org/10.1371/journal.pmed.1000097

Nebytova, L. A., Katrenko, M. V., Savin, D. I., & Zhuravleva, Y. I. (2021). Augmented reality in the training process of children with hearing disorders. In *Distance learning technologies (DLT 2019)* (pp. 330-339). CEUR-WS.

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., McGuinness, L. A., et al. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ, 372*, Article n71. https://doi.org/10.1136/bmj.n71

Parmaxi, A. (2020). Virtual reality in language learning: A systematic review and implications for research and practice. *Interactive Learning Environments, 31*(1), 172-184. https://doi.org/10.1080/10494820.2020.1765392

Parong, J., & Mayer, R. E. (2018). Learning science in immersive virtual reality. *Journal of Educational Psychology, 110*(6), 785-797. https://doi.org/10.1037/edu0000241

Passig, D., & Eden, S. (2000a). Enhancing the induction skill of deaf and hard-of-hearing children with virtual reality technology. *Journal of Deaf Studies and Deaf Education, 5*(3), 277-285. https://doi.org/10.1093/deafed/5.3.277

Passig, D., & Eden, S. (2000b). Enhancing induction skills of deaf and hard-of-hearing children with virtual reality technology. *Journal of Deaf Studies and Deaf Education, 5*(3), 277-285.

Passig, D., & Eden, S. (2001). Virtual reality as a tool for improving spatial rotation among deaf and hard-of-hearing children. *Cyberpsychology & Behavior, 4*(6), 681-686.

Passig, D., & Eden, S. (2003). Cognitive intervention through virtual environments among deaf and hard-of-hearing children. *European Journal of Special Needs Education, 18*(2), 1-10.

Passig, D., & Eden, S. (2010). Enhancing time connectives with 3D immersive virtual reality (IVR). *Journal of Educational Computing Research, 42*(3), 307-328. https://doi.org/10.2190/EC.42.3.d

Pati, D., & Lorusso, L. N. (2018). How to write a systematic review of the literature. *Healthcare Engineering & Management Review, 11*(1), 15-30. https://doi.org/10.1177/1937586717747384

Petticrew, M., & Roberts, H. (2006). *Systematic reviews in the social sciences: A practical guide*. Blackwell Publishing.

Piaget, J. (1972). Intellectual evolution from adolescence to adulthood. *Human Development, 15*(1), 1-12. https://doi.org/10.1159/000271225

Poobrasert, O., & Cercone, N. (2008). Technology-enhanced learning for students with deafness in the digital age. In K. Kinshuk, D. G. Sampson, J. M. Spector, P. Isaías, & D. Ifenthaler (Eds.), *Proceedings of the IADIS International Conference on Cognition and Exploratory Learning in Digital Age (CELDA 2008)* (pp. 357-360). IADIS Press.

Porcar-Gozalbo, N., López-Zamora, M., Valles-González, B., & Cano-Villagrasa, A. (2024). Impact of hearing loss type on linguistic development in children: A cross-sectional study. *Audiology Research, 14*(6), 1014-1027. https://doi.org/10.3390/audiolres14060084

Qi, S., & Mitchell, R. E. (2012). Large-scale academic achievement testing of deaf and hard-of-hearing students: Past, present, and future. *Journal of Deaf Studies and Deaf Education, 17*(1), 1-18. https://doi.org/10.1093/deafed/enr028

Radianti, J., Majchrzak, T. A., Fromm, J., & Wohlgenannt, I. (2020). A systematic review of immersive virtual reality applications for higher education: Design elements, lessons learned, and research agenda. *Computers & Education, 147*, Article 103778. https://doi.org/10.1016/j.compedu.2019.103778

Rahim, N. R., & Abdul Rahim, A. A. (2022). A virtual reality approach to support Malaysian sign language interactive learning for deaf-mute children. *Journal of Pharmaceutical Negative Results, 13*(Special Issue 7), 4962-4974. https://doi.org/10.47750/pnr.2022.13.S07.614

Reed, S., Antia, S. D., & Kreimeyer, K. H. (2008). Academic status of deaf and hard of hearing students in public schools. *Journal of Deaf Studies and Deaf Education, 13*(4), 485-502. https://doi.org/10.1093/deafed/enn006

Rho, M. J., et al. (2020). AI-based learning systems for special education. *IEEE Access, 8*, 1-12.

Safar, F., & Abdul Raman, N. A. (2021). Pendidikan interaktif: Penerokaan virtual reality (VR) dalam visualisasi model seni bina. *ANP Journal of Social Science and Humanities, 2*(2), 26-38. https://doi.org/10.53797/anpjssh.v2i2.4.2021

Serafin, S., et al. (2023). Mixed reality in education: A systematic review. *Education and Information Technologies, 28*, 1-20.

Slater, M., & Sanchez-Vives, M. V. (2016). Enhancing presence in immersive virtual environments. *Frontiers in Robotics and AI, 3*, Article 74. https://doi.org/10.3389/frobt.2016.00074

Sudana, A. K. O., Aristamy, I. G. A. A. M., & Wirdiani, N. K. A. (2016). Augmented reality application of sign language for deaf people in Android based smartphone. *International Journal of Software Engineering and Its Applications, 10*(8), 139-150.

Sweller, J. (2011). Cognitive load theory. In J. P. Mestre & B. H. Ross (Eds.), *The psychology of learning and motivation: Cognition in education* (Vol. 55, pp. 37-76). Academic Press. https://doi.org/10.1016/B978-0-12-387691-1.00002-8

Tabachnick, B. G., & Fidell, L. S. (2019). *Using multivariate statistics* (7th ed.). Pearson.

Taylor, K., & Yuknis, C. (2023). Universal Design for Learning supports distance learning for deaf students. *American Annals of the Deaf, 168*(3), 41-54. https://doi.org/10.1353/aad.2023.a917249

Teófilo, J., et al. (2018). VR usability in educational contexts. *Interactive Learning Environments, 26*(5), 1-15.

Theunissen, S. C. P. M., Rieffe, C., Netten, A. P., Briaire, J. J., Soede, W., Kouwenberg, M., et al. (2014). Self-esteem in hearing-impaired children: The influence of communication, education, and audiological characteristics. *PLoS ONE, 9*(4), Article e94521. https://doi.org/10.1371/journal.pone.0094521

Tomblin, J. B., et al. (2015). Language outcomes in young children with hearing loss. *Ear and Hearing, 36*, 76S-91S. https://doi.org/10.1097/AUD.0000000000000219

Tukpah, J., Soevik, N., Bansal, S., Singh, T., & Yildirim, C. (2023). VirtuSign: AI-powered, gamified VR application for ASL alphabet. In *Proceedings of the 2023 International Conference on Mobile and Ubiquitous Multimedia (MUM)* (pp. 538-540). ACM. https://doi.org/10.1145/3626705.3631800

Ubur, S. D. (2024). Enhancing accessibility and emotional expression in educational extended reality for deaf and hard of hearing: User-centric investigation. *IEEE VRW 2024*.

UNESCO. (2020). *Education in a post-COVID world: Nine ideas for public action*. United Nations Educational, Scientific and Cultural Organization.

UNESCO. (2021). *Reimagining our futures together: A new social contract for education*. UNESCO Publishing.

Vogel, J., Bowers, C., Meehan, C., Hoeft, R., & Bradley, K. (2004). VR for life skills education: Program evaluation. *Deafness & Education International, 6*(1), 39-–50. https://doi.org/10.1179/146431504790560636

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.

WHO. (2021). *World report on hearing*. World Health Organization. https://www.who.int/publications/i/item/world-report-on-hearing

WHO. (2023). *Deafness and hearing loss: Key facts*. World Health Organization. https://www.who.int/news-room/fact-sheets/detail/deafness-and-hearing-loss

Wong, M. T., & Rashid, S. M. M. (2022). Challenges of special education teachers in implementation individual education plan (IEP) for students with learning disabilities (LD). *International Journal of Academic Research in Business and Social Sciences, 12*(11), 2146-2160. https://doi.org/10.6007/IJARBSS/v12-i11/15159

Xiao, Y., & Watson, M. (2019). Guidance on conducting a systematic literature review. *Journal of Planning Education and Research, 39*(1), 93-112. https://doi.org/10.1177/0739456X17723971

Yang, F. C., Mousas, C., & Adamo, N. (2022). Holographic sign language avatar interpreter: A user interaction study in a mixed reality classroom. *Computers & Graphics: Virtual Worlds, 33*(3-4). https://doi.org/10.1002/cav.2082

Yusoff, M. H., Ahmad, R., & Zulkifli, F. Z. (2021). Exploring the use of virtual reality for teaching history in Malaysian secondary schools. *International Journal of Education and Development using ICT, 17*(4), 99-112.

Zirzow, N. K. (2015). Signing avatars: Using virtual reality to support students with hearing loss. *Journal of Special Education Technology, 30*(4), 239-244. https://doi.org/10.1177/875687051503400307

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Review Article

Nationalist Narratives in Sports Event Reporting: A Systematic Literature Review

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ABSTRACT

Sporting events have increasingly become sites through which media construct and circulate national meanings. This systematic literature review synthesises 14 peer-reviewed journal articles published between January 2021 and April 2025 and identified through Web of Science and ScienceDirect. It examines how nationalism, national identity, and related forms of national representation are defined and represented in sports media reporting and closely related platform-mediated sports communication. The study finds that media texts link sporting achievements, athletes, and international events with national meaning through heroic representation, binary opposition, and emotional mobilisation. The analysis also shows that race, gender, immigration, citizenship, disability status, and geopolitical context collectively shape the boundaries of national belonging in sports media reporting. The evidence is primarily qualitative and case-based, encompassing critical discourse analysis, textual analysis, qualitative content analysis, and corpus-assisted methods. The studies frequently focus on international competitions, while audience reception, digital platform communication, systematic cross-cultural comparison, and geographical diversity remain underdeveloped. Future research should combine media-text analysis with audience-centred methods and develop comparative, cross-platform designs that remain sensitive to contextual differences.

Keywords: Media discourse, national identity, nationalism, sports journalism, sports media

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INTRODUCTION

In the increasingly intertwined communication environment of globalisation and nation-states, sports events, as one of the most influential transnational media activities in the world, are gradually

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becoming an important stage for building and spreading nationalism (Weber, 2021). Sports events, especially large-scale international events such as the Olympic Games and the World Cup, have long had multiple functions, including shaping national identity, collective honour and political symbolism (Roche, 2002). Through a strong communication mechanism, sport not only becomes a platform to show national strength, but also an important field to activate and reproduce modern nationalism in daily life. By giving specific meanings to victory or defeat, building the national image of athletes, and repeatedly using national symbols, the media has effectively stimulated the public's emotional resonance (Mutz & Gerke, 2024). In this process, sport has become a form of emotional expression to build national identity.

In recent years, the global media environment has undergone profound changes. Digitalisation and platformisation have reshaped the logic of news production and dissemination, while social media has broken the monopoly of traditional mainstream media on public narratives (Burgess & Hurcombe, 2019). Ordinary users, fans, and even athletes themselves can now directly participate in the construction of nationalist narratives. This transformation has led to the increasing diversity of the expression of sport nationalism and the increasingly blurred boundaries. In sports reports, nationalism is no longer completely defined only by state-led publicity, but can also be shaped by fan-led cultural production. From emotional mobilisation to the expression of identity politics, nationalism in the context of sports is increasingly manifested as a practice involving multiple centres and multi-participants (Hartmann, 2023).

Against this changing communication landscape, this article reexamines nationalism and national identity in sports event reporting through a systematic review of recent scholarship published during the review period. Although previous studies have examined sports, nationalism, media framing, and political communication from different perspectives, the literature remains dispersed across theoretical traditions and research contexts. This review brings these strands together to develop an integrated understanding of how nationalism is conceptualised, how media construct national meaning, and how research in this field has developed. Specifically, this study addresses the following research questions:

RQ1 : How is nationalism defined and examined within the context of sports event reporting?

RQ2 : What narrative strategies do the media employ to convey nationalist themes in sports coverage?

RQ3 : What are the key features of existing research in terms of theoretical perspectives, research subjects, and methodological approaches?

This study contributes to relevant academic fields by systematically reviewing recent research on nationalist narratives in sports event reporting. It examines not

only sport nationalism but also related perspectives, including conceptualisations of nationalism, media narrative strategies, theoretical approaches, and methodological characteristics. By identifying recurring patterns and research gaps, the review clarifies the current state of the field and provides a basis for future research. In the context of rising global political tensions and the continuing internationalisation of sport, re-examining nationalist narratives in sports events has both academic and practical value. It also contributes to a deeper understanding of the social functions and ideological mechanisms of nationalist media discourse.

LITERATURE REVIEW

The relationship between sports reporting and nationalist narratives has long been an important topic in the field of political communication. In conventional theoretical accounts, nationalism is understood as an ideological construction that may be shaped by the state, with the media serving as an important channel through which national identity is circulated.

Billig (1995) proposed the concept of banal nationalism, emphasising that national identity appears not only in major crises or wars, but also appears in daily news reports through "invisible symbols" such as flags, country names, and geographical labels. This concept was then widely used in sports reporting research, revealing how news reporting unconsciously revitalised the concept of nationality by mentioning the group to which athletes belong and their sports achievements (Sasao, 2024). Although Banal nationalism explains the daily reappearance of national identity, it pays less attention to how the media takes the initiative to build national meaning in highly symbolic sports events. This limitation prompts scholars to combine nationalist research with Framing theory.

To further examine how media constructs meaning, scholars often adopt Framing theory as an analytical framework. Goffman (1974) laid the cognitive foundation for the concept of frames, while Entman (1993) systematised it as a way of communication, pointing out that the media constructs a specific meaning structure through emphasis, exclusion, and interpretation. In the study of sports communication, scholars use this method to analyse how the media embed nationalist information in reports through strategies such as heroism, altruism of opponents, and collective sacrifice.

Markus et al. (2006) conducted a cross-cultural analysis of American and Japanese media coverage of the 2000 and 2002 Olympics and found significant cultural differences in how athletic performance was explained. American media emphasised individual attributes and personal uniqueness, whereas Japanese media foregrounded the athlete's coach, team, and emotional experience. These findings suggest that identical sporting events may be interpreted through culturally distinct narrative frameworks.

Taken together, banal nationalism explains the routine reproduction of national identity, whereas Framing theory explains how these symbols are organised and interpreted in media narratives. Rather than

representing competing perspectives, the two theories address different dimensions of nationalist communication. Together, they complement one another in explaining how sports media simultaneously reproduce national identity and actively shape nationalist meanings.

With the rapid development of social media and platform-based communication, studies of nationalism in sports reporting have shown new directions of exploration. User-generated content, interactive communication, and "fan politics" have blurred the boundaries between the state and the individual, making nationalist expression more decentralised. For example, Abe (2024) examined the nationalist comments by Indonesian users on Twitter during the 2023 Southeast Asian Games and found that these comments were often articulated through humorous and satirical language and constituted a form of unofficial banal nationalism.

Similarly, Swart and Hussain (2023) examined the global broadcasting of the 2022 Qatar World Cup from a postcolonial perspective. Their analysis showed that media representations of cultural others as "non-modern" could reproduce Western-centric cultural hegemony through ritualised reporting and visual encoding. These developments suggest that contemporary sports nationalism is increasingly shaped through interactions among media organisations, digital platforms, athletes, and audiences. They also extend accounts of banal nationalism by highlighting the active negotiation of nationalist narratives in digital environments.

At the methodological level, textual analysis and critical discourse analysis remain the most commonly used research methods. These methods are mainly used to examine how ideology and national emotions are integrated into sports news texts. For example, Han et al. (2023) compared British and American media reports on China's image during the Beijing Winter Olympics. Their analysis found that there is a contrast between authoritarianism and democratic values on both sides. At the same time, they also identified differences in emotional expression: British reports are relatively restrained and analytical, while American reports use emotional language more frequently. This case should be interpreted in relation to its specific media and geopolitical context.

However, these studies mainly focus on the media's texts themselves, and little attention is paid to how the audience interprets, negotiates, or reconstructs nationalist discourse. Therefore, existing research provides only a partial understanding of how the audience recognises or questions about nationalist narratives, and how nationalism circulates in the contemporary media environment.

There is an obvious imbalance in geographical coverage and event selection in existing studies. According to the literature review, most current research is concentrated on media powers such as the United Kingdom and the United States. These studies primarily examine media coverage of major international sporting events, including the Olympic Games and the World Cup. Coverage of the Nathan Chen

and Yuzuru Hanyu match, the European Championship, or analyses of public opinion across several Olympic Games illustrates the continuing prominence of major events and mainstream national media in studies of nationalist narratives (Ho & Lim, 2023; Jia et al., 2022; Mauro, 2024).

By contrast, research on "global southern" countries is still relatively scarce. Most studies focus on the narrative mode of mainstream media, and little attention was paid to the unofficial expressions of nationalism expressed by ordinary users on social media. Therefore, current understandings of nationalist narratives remain strongly shaped by Western media systems and large-scale sports events, limiting the universality of existing research results in different cultural and media contexts.

A few scholars have begun to solve these limitations. For example, Mihelj and Jiménez-Martínez (2021) studied digital nationalism and pointed out how algorithmic recommendation systems and platform logics may amplify collective emotions and make nationalist discourse more emotionally impactful on the Internet. This perspective expands the research of predecessors, focusing on the technical and emotional mechanism of nationalism-related narratives in digital environments.

In general, existing studies provide important insights into nationalism in sports events, especially in terms of theoretical frameworks, narrative strategies, and communication mechanisms. However, the relevant literature is still scattered in different theoretical traditions, methodologies, and research backgrounds, resulting in a lack of a comprehensive understanding of the nationalist narratives in sports reporting. Based on these research results, this review systematically examines the conceptualisation of nationalism, the construction of nationalist narratives in media reporting, and the development of theory, themes, and methodology in this field.

METHODS

This study adopts the systematic literature review method to comprehensively examine the academic research on nationalism, national identity, and related ethnic significance in sports media reports from January 2021 to April 2025. The purpose is to clarify the theoretical methods, research focus, and existing research gaps in this field. The systematic literature review emphasises the repeatability and transparency of the retrieval process, which is suitable for integrating scattered research results into a coherent description of the field (Abu-Salih & Alotaibi, 2024).

Search Strategy and Data Sources

The Web of Science and ScienceDirect were selected as complementary sources for this review. The Web of Science provides multidisciplinary citation indexing across communication, media, sport, and social science journals, whereas ScienceDirect provides access to journals in media, culture, communication, and related social science fields. The selection was intended to provide a structured and manageable search of peer-reviewed literature relevant to nationalism in sports-media reporting.

This database selection constitutes a pragmatic search boundary rather than a claim of exhaustive coverage. Scopus, SPORTDiscus, Communication & Mass Media Complete, and regional databases were not searched because of institutional-access and feasibility constraints. This decision reflects the practical scope of the review rather than a judgment that these databases are irrelevant to the topic. Consequently, relevant studies indexed exclusively in those databases may not have been retrieved. This limitation is considered when interpreting the scope and transferability of the synthesis.

The literature search was conducted on 30 April 2025 and was limited to studies published from 1 January 2021 to 30 April 2025. Web of Science and ScienceDirect were searched in the title, abstract, and keyword fields using Boolean operators. The search strategy comprised two concept sets: terms relating to sport or sports media communication and terms relating to nationalism and national meaning. The search string was: ("sports media" OR "sports journalism" OR "sports reporting" OR "media coverage of sports events" OR "international sports events" OR sport) AND (nationalism OR nationalist OR "national identity" OR patriotism OR "nationalist narrative" OR "nationalist discourse" OR "sports nationalism" OR "sport nationalism" OR "sporting nationalism" OR "banal nationalism" OR "cultural nationalism" OR "digital nationalism"). No additional mandatory framing or narrative set was imposed at the retrieval stage. Instead, the relevance of retrieved records to sports media reporting was determined during title and abstract screening.

The same conceptual strategy was implemented separately through the field-search functions available in each database. In the Web of Science, the search was conducted in the Topic field using TS = syntax. In ScienceDirect, the query was entered through the title, abstract, and keyword search interface without a Web of Science field prefix. Because ScienceDirect applies year-level date filtering, records published in 2025 were screened individually to retain only articles published on or before 30 April 2025. Full database-specific search details are reported in Table 1.

The initial search across the two databases identified 4,397 records (Web of Science, n = 453; ScienceDirect, n = 3,944). After seven duplicate records were removed, 4,390 records underwent title and abstract screening. At this stage, 4,290 records were excluded because they did not meet the publication, date, language, substantive-focus, or media-relevance criteria. The remaining 100 records underwent preliminary eligibility screening based on bibliographic information and abstracts. Seventy-one records were excluded because they did not meet the prespecified eligibility criteria, and a further seven records were excluded because they lacked a direct analytical focus on mediated national meaning in sport. The remaining 22 reports were sought and retrieved in full text. Following full-text assessment, eight reports

Table 1
Database-specific search strategy and search details

Database	Search Date	Search Field and Database-Specific Syntax	Search String	Filters and Date Handling	Records Identified
Web of Science	30 April 2025	Topic field: title, abstract, author keywords, and Keywords Plus.	TS = ("sports media" OR "sports journalism" OR "sports reporting" OR "media coverage of sports events" OR "international sports events" OR sport) AND (nationalism OR nationalist OR "national identity" OR patriotism OR "nationalist narrative" OR "nationalist discourse" OR "sports nationalism" OR "sport nationalism" OR "sporting nationalism" OR "banal nationalism" OR "cultural nationalism" OR "digital nationalism")	Publication dates: 1 January 2021 to 30 April 2025. English-language, peer-reviewed journal-article status, and full-text availability were confirmed during screening.	453
ScienceDirect	30 April 2025	Title, abstract, and keyword search interface. The conceptual query was entered without the Web of Science TS field prefix.	("sports media" OR "sports journalism" OR "sports reporting" OR "media coverage of sports events" OR "international sports events" OR sport) AND (nationalism OR nationalist OR "national identity" OR patriotism OR "nationalist narrative" OR "nationalist discourse" OR "sports nationalism" OR "sport nationalism" OR "sporting nationalism" OR "banal nationalism" OR "cultural nationalism" OR "digital nationalism")	The platform's 2021-2025 year filter was applied. Records dated May–December 2025 were excluded manually, so that only articles published on or before 30 April 2025 were retained. English-language, peer-reviewed journal-article status, and full-text availability were confirmed during screening.	3,944

Note. TS denotes the Web of Science Topic field. The same conceptual search strategy was implemented through the field-search functions available in each database. The ScienceDirect date restriction was refined manually because its interface applies to a year-level filter
Source: Authors' own work

were excluded: four focused on generic fan or public discussion rather than sports-media reporting; one examined event or ceremony texts rather than media texts; one was not a peer-reviewed journal article; and two were published outside the review period. Fourteen peer-reviewed journal articles met all eligibility criteria and were included in the systematic review.

Following full-text assessment, studies were retained when they directly examined sports journalism, media coverage, mediated event texts, or journalist-linked and news-linked platform communication. Nationalism, national identity, patriotism, or national representation also had to constitute a substantive analytical focus. Studies centred on sport participation, public health, governance, or generic fan or public discussion without a direct analytical focus on mediated national meaning were excluded. The final corpus comprised 14 peer-reviewed journal articles. The study selection process is presented in Figure 1.

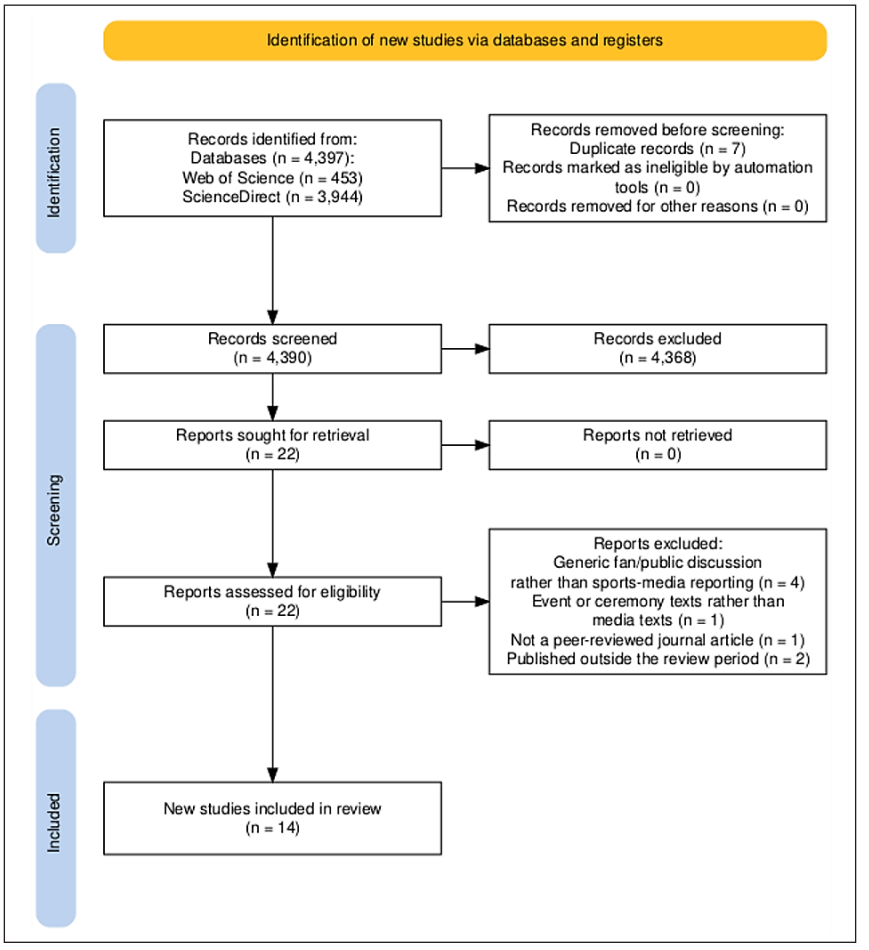

Figure 1. PRISMA literature screening flowchart
Source: Authors' own work

Inclusion Criteria

Articles were included if they: (a) were published in English in a peer-reviewed journal between 1 January 2021 and 30 April 2025; (b) examined nationalism, national identity, patriotism, national representation, or a closely related national meaning construct within sport; (c) analysed an identifiable corpus of sports journalism, media coverage, mediated event text, or journalist-linked and news-linked platform communication; and (d) reported a sufficiently clear empirical, analytical, conceptual, or review approach to support the interpretation of findings.

Exclusion Criteria

Studies were excluded if they: (a) were editorials, conference papers, book chapters, book reviews, newspaper commentaries, opinion pieces, or publications without a clearly described analytical approach; (b) were published outside the review period; (c) were not in English or could not be assessed from an accessible formal record; (d) treated sport without a substantive focus on nationalism or national identity; (e) referred to national identity only in passing; and (f) examined user-generated fan or public discussion, institutional conditions, participation barriers, or event performance without a direct analytical link to mediated national meaning in sports communication.

Table 2 summarises the eligibility relevance of the 14 included studies, identifying the national-meaning construct, media material, and analytical role of each study in the synthesis.

Methodological Quality Assessment

The included studies used different forms of qualitative and interpretive analysis, including critical discourse analysis, textual analysis, qualitative content analysis, and corpus-assisted analysis. Despite these procedural differences, all studies examined naturally occurring media texts and drew interpretive conclusions about mediated national meaning. The Joanna Briggs Institute (JBI) Critical Appraisal Checklist for Qualitative Research was therefore used to assess cross-cutting features relevant to all studies, including congruity between the research question, theoretical perspective, data source, analytical procedure, and interpretation of findings (Lockwood et al., 2020).

The checklist was not used to impose a single methodological standard on the included designs or to generate a numerical quality score. Instead, it was used to assess the transparency and coherence of each study's reported analytical process. Items concerning researcher positioning and reflexivity were retained because they are relevant to interpretive media research, while items concerning participant representation and ethical approval were recorded as not applicable when a study analysed publicly available media material rather than human participants. The appraisal informed the interpretation of the synthesis and was not used as a criterion for excluding studies. Item-level results are reported in Table 3.

Table 2
Eligibility relevance of the 14 included studies

Study	National-Meaning Construct Examined	Sports Media Material	Eligibility Relevance / Role in Synthesis
Kim (2024)	Sports nationalism	Korean sports-news coverage of FIFA World Cups	Direct media-text analysis of the changing discourse of Korean sports nationalism.
Chen and Chiang (2023)	Sport nationalism; Taiwanese identity	News-linked Facebook communication during Tokyo 2020	Direct analysis of mediated Taiwanese identity and sport nationalism.
Humayun (2023)	Mediated national identity	Pakistani and Indian sports journalists' Twitter posts	Direct analysis of journalists' construction of national identity during cricket rivalry.
McCree (2022)	Sport nationalism; gendered national recognition	Local newspaper coverage of the 1979 World Netball Tournament	Direct analysis of press representations linking women's sport to national recognition.
Mauro (2025)	Race and national identity	English and Italian media coverage of UEFA Euro 2020	Direct comparative analysis of mediated national belonging and racialisation.
Zhang and Shi (2024)	National and ethnic identity	Chinese and US news coverage of Eileen Gu	Direct comparative analysis of media constructions of national identity.
Ziaee et al. (2021)	Iranian national identity	Iranian national and sport-media coverage of football tournaments	Direct content analysis of media construction of national identity.
Kobayashi et al. (2023)	Cosmopolitan nationalism	Japanese media representations of the 2019 Rugby World Cup	Direct analysis of media discourse connecting mega-events and national identity.
Choi (2023)	Nationalism; multicultural national belonging	Korean and Canadian news coverage of naturalised ice-hockey players	Direct analysis of news representations of citizenship, race, and national belonging.
Kramareva and Grix (2023)	Russian national identity; geopolitical othering	UK and US media representations of Olympic ceremonies	Direct comparative analysis of mediated national identity and international othering.
Yang and Lin (2023)	National identity; national-hero discourse	CCTV sports-channel coverage of Paralympic champions	Direct textual analysis of televised national representation narratives.
Park and Shin (2023)	Olympic nationalism; gender and whiteness	South Korean media representations of Coach Sarah Murray	Direct critical analysis of mediated Olympic nationalism and national hierarchy.
Zhang and Caple (2021)	Nationalism; national responsibility	Four Chinese and international English-language news outlets	Direct comparative analysis of media discourse on Li Na and Chinese national responsibility.
Latififard et al. (2024)	National identity; refugee/compatriot categorisation	Iranian state-owned media and public social-media posts	Direct content analysis of mediated national categorisation during the Tokyo Olympics.

Source: Authors' own work

Table 3
Methodological quality appraisal of the included studies using the JBI Critical appraisal checklist for qualitative research

Study	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Appraisal note
Kim (2024)	Y	Y	Y	Y	Y	N	N	N/A	N/A	Y	CDA, corpus and interpretive procedures are reported; author positionality and reflexivity are not discussed.
Chen and Chiang (2023)	Y	Y	Y	Y	Y	N	N	N/A	N/A	Y	CDA is aligned with the research aim and online news-linked material; reflexive positioning is not reported.
Humayun (2023)	U	Y	Y	Y	Y	N	N	N/A	N/A	Y	The tweet corpus and open/axial coding are clearly described; the underlying qualitative perspective is not explicitly located.
McCree (2022)	U	Y	Y	Y	Y	N	N	N/A	N/A	Y	The newspaper corpus and qualitative content analysis are reported; philosophical positioning and reflexivity are not explicit.
Mauro (2025)	Y	Y	Y	Y	Y	N	N	N/A	N/A	Y	CDA and theories of race/national identity are coherently linked to the comparative media corpus; reflexivity is not reported.
Zhang and Shi (2024)	Y	Y	Y	Y	Y	N	N	N/A	N/A	Y	Frame analysis and CDA are applied to a specified Chinese-US news corpus; researcher positioning is not reported.
Ziaee et al. (2021)	U	Y	Y	Y	Y	N	N	N/A	N/A	Y	The sampling window and coding scheme are reported; a formal qualitative philosophical position is not stated.
Kobayashi et al. (2023)	Y	Y	Y	Y	Y	N	N	N/A	N/A	Y	CDA is clearly aligned with cosmopolitan nationalism and the media corpus; reflexivity is not reported.
Choi (2023)	Y	Y	Y	Y	Y	N	N	N/A	N/A	Y	Critical discourse studies are coherently connected to the cross-national news corpus; reflexivity is not reported.
Kramareva and Grix (2023)	U	Y	Y	Y	Y	N	N	N/A	N/A	Y	The comparative documentary/media sample and analytical procedure are reported; philosophical positioning is not explicit.
Yang and Lin (2023)	U	Y	Y	Y	Y	N	N	N/A	N/A	Y	The televised corpus and textual analysis are specified; qualitative philosophical positioning and reflexivity are not explicit.

Table 3 (*continued*)

Study	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Appraisal note
Park and Shin (2023)	Y	Y	Y	Y	Y	N	N	N/A	N/A	Y	Intersectional CDA is linked to the media material and interpretation; reflexive researcher positioning is not reported.
Zhang and Caple (2021)	Y	Y	Y	Y	Y	N	N	N/A	N/A	Y	The comparative corpus, corpus assisted procedures and interpretation are transparent; reflexivity is not reported.
Latififard et al. (2024)	U	Y	Y	Y	Y	N	N	N/A	N/A	Y	Inductive content analysis, sources and intercoder procedure are reported; qualitative philosophical positioning and reflexivity are not explicit.

Note. The JBI checklist was applied to assess the transparency and coherence of reported qualitative and interpretive media-text research. It was not used to generate a numerical quality score or to exclude studies. Y = yes; N = no; U = unclear; N/A = not applicable. An N rating indicates that the relevant feature was not adequately reported in the published article; it does not necessarily indicate that the practice was absent from the original research process. Items 8 and 9 were marked N/A when a study analysed published news, broadcast, or publicly accessible platform material rather than participant accounts or other human-subject data)
*Appraisal item definitions. Q1: Congruity between stated philosophical perspective and methodology. Q2: Congruity between methodology and research question/objectives. Q3: Congruity between methodology and data collection. Q4: Congruity between methodology and data representation/analysis. Q5: Congruity between methodology and interpretation. Q6: Researcher culturally or theoretically located. Q7: Influence of researcher on research, and vice versa, addressed. Q8: Participant voices adequately represented. Q9: Ethical approval/evidence of ethical conduct. Q10: Conclusions flow from analysis or interpretation of data
Source: Authors' own work

The appraisal indicated that the included studies generally reported coherent links between their research questions, media materials, analytical procedures, and interpretations. However, the philosophical position was unclear in six studies, and researcher positioning and reflexivity were not adequately reported in the included articles. These reporting limitations do not invalidate the studies, but they limit the extent to which the interpretive process can be independently assessed. Accordingly, the synthesis identifies recurring analytical patterns across the reviewed corpus rather than estimating the prevalence or strength of particular forms of nationalism across sports-media systems.

Screening and Coding Reliability

Title and abstract screening, full-text eligibility assessment, data extraction, coding, and methodological quality appraisal were initially conducted by the first reviewer. To strengthen the reliability of the final review decisions, a second researcher independently reviewed the eligibility decisions for all 22 reports assessed in full text, including the 14 included studies and the eight reports excluded after full-text assessment. The second researcher also checked the coding and JBI appraisal of the 14 included studies against the coding manual and appraisal criteria. Discrepancies were discussed and resolved by consensus. Throughout the review, prespecified eligibility criteria, a structured coding manual, and a screening-decision log were used to support consistency and transparency. Although the initial title and abstract screening was conducted by one reviewer, independent verification at the full-text, coding, and appraisal stages reduced the risk of selection and interpretive bias. It did not eliminate that risk completely.

Coding and Analytical Approach

The final corpus was synthesised using structured thematic coding. The coding framework was applied to the 14 studies. The aim was interpretive comparison across studies rather than statistical pooling.

The coding manual specified six dimensions: (1) event or subject; (2) media material; (3) analytical approach; (4) country or region; (5) theoretical perspective; and (6) national-meaning construct and representational strategy. For each dimension, the manual provided operational definitions and classification rules.

Following the initial coding, all coding decisions were reviewed against the original publication record and the corresponding study summary. The researcher compared coding decisions across cases to ensure that terms such as sports nationalism, nationalist discourse, national identity, cultural nationalism, and cosmopolitan nationalism were applied consistently and were not treated as interchangeable.

For example, Kim (2024) traces changing constructions of sports nationalism in Korean World Cup reporting, linking

national achievement to sacrifice and meritocratic aspiration. Mauro (2025) examines how English and Italian media articulate race and national identity during Euro 2020, with particular attention to racialised belonging. These studies show how sports media discourse connects national meaning to distinct historical, cultural, and political conditions.

All coding results are recorded in a structured coding table. Table 4 summarises the media material, analytical approach, and substantive contribution of the 14 included studies.

RESULTS

This study systematically reviews and thematically analyses 14 peer-reviewed journal articles, organising the findings around the three research questions that guide this review. The analysis identifies how nationalism is defined and examined in sports reporting (RQ1), what narrative strategies media employ to convey nationalist themes (RQ2), and what characterises existing research in terms of theoretical perspectives, research subjects, and methodological approaches (RQ3). The following sections present the synthesised findings across the reviewed studies.

RQ1: Defining and Examining Nationalism in Sports Event Reporting

The 14 studies use related but analytically distinct concepts to examine mediated national meaning in sport. Some focus on sport nationalism and the symbolic connection between sporting achievement and the nation. Others examine national identity, national belonging, or national representation in relation to race, immigration, citizenship, gender, or disability. A smaller group considers national meaning in transnational media contexts, including cosmopolitan nationalism and representations of other nations. These concepts overlap because they all concern the relationship between sport, media representation, and the nation, but they address different dimensions of that relationship. Table 5 summarises these distinctions.

Several studies show that athletes and sport teams represent not only sporting achievements, but also national strength, values, and history. For example, Kim (2024), Yang and Lin (2023) and Ziaee et al. (2021) associate sports achievements with sacrifice, perseverance, national reputation and collective memory. In this way, athletic performance becomes part of a broader national story.

National identity is also examined through the boundaries of belonging. Studies by Mauro (2025), Choi (2023) and Park and Shin (2023) show that race, immigration, whiteness, gender and citizenship affect who can be accepted as national representatives. McCree (2022) also shows that media coverage of women's sport is influenced by gender and may affect the construction of sport nationalism.

Table 4
Summary of the journal articles reviewed

Author (Year)	Event/ Subject	Media Material and Method	Country/ Region	Theoretical Perspective	Representational Strategy	National-Meaning Construct	Key Finding
Kim (2024)	Korean national football team; FIFA World Cups	News articles; critical discourse analysis	South Korea	Sports nationalism; CDA	National traits, sacrifice, meritocratic achievement	Sports nationalism	Korean reporting links football to changing national identity and neoliberal merit.
Chen and Chiang (2023)	Tokyo 2020 Olympics	News-linked Facebook communication; discourse analysis	Taiwan	Performativity; sport nationalism	Athletes as proxy representatives; democratic distinction	Sport nationalism	Platform communication performs Taiwanese identity amid geopolitical tension.
Humayun (2023)	2017 ICC Champions Trophy final	641 sports-journalist tweets; textual analysis	Pakistan and India	Elias's habitus thesis	In-group/out-group comparison; journalistic style	National identity	Journalists' tweets construct contrasting national identities during cricket rivalry.
McCree (2022)	1979 World Netball Tournament	Local newspaper reports; qualitative content analysis	Trinidad and Tobago	Gendered sport nationalism	Gendered valuation and national representation	Sport nationalism	Press coverage connects women's netball with gendered forms of national recognition.
Mauro (2025)	UEFA Euro 2020	English and Italian media; critical discourse analysis	England and Italy	Race and racialisation	Inclusion, exclusion, and racialised belonging	National identity	Race remains central to mediated constructions of national belonging.
Zhang and Shi (2024)	Eileen Gu; Beijing 2022	Chinese and US media; frame analysis and CDA	China and United States	Framing; CDA	Competing national and ethnic roles	National identity	Media in both countries negotiates Gu's national identity through competing frames.

Table 4 (*continued*)

Author (Year)	Event/ Subject	Media Material and Method	Country/ Region	Theoretical Perspective	Representational Strategy	National-Meaning Construct	Key Finding
Latififard et al. (2024)	Kimia Alizadeh; Tokyo 2020 Olympic Games	Iranian state-owned media and public social-media posts; inductive content analysis	Iran	Media framing; national identity	Compatriot/ refugee categorisation; patriotic and gendered representation	National identity	Iranian media and public posts construct Alizadeh through competing national belonging and refugee frames.
Ziaee et al. (2021)	2018 FIFA World Cup; 2019 AFC Asian Cup	Iranian national and sport media; content analysis	Iran	National identity	Unity, determination, oppression, emotionality	National identity	Iranian football coverage reproduces national identity through political and historical references.
Kobayashi et al. (2023)	2019 Rugby World Cup	Japanese newspaper and public materials; CDA	Japan	Cosmopolitan nationalism	Conditional inclusion and "One Team" discourse	Cosmopolitan nationalism	Cosmopolitan imagery is incorporated into a renewed Japanese national narrative.
Choi (2023)	PyeongChang 2018 ice hockey	Canadian and Korean news coverage; critical discourse studies	South Korea and Canada	Transnationalism; critical multiculturalism	Migration, whiteness, and citizenship	Multicultural nationalism	News coverage uses naturalised athletes to negotiate national belonging and hierarchy.
Kramareva and Grix (2023)	1980 Moscow and 2014 Sochi ceremonies	UK and US media; documentary analysis	Russia, United Kingdom, United States	Soft power; strategic narratives	Othering and reciprocal national narratives	National identity	Western coverage helps reproduce reciprocal Russian–Western identities.
Yang and Lin (2023)	Paralympic champions on CCTV	Television coverage; textual analysis	China	Social model of disability; critical perspectives	National hero and self-reliance narratives	National identity	CCTV incorporates Paralympic champions into narratives of national reputation and citizenship.

Table 4 (*continued*)

Author (Year)	Event/ Subject	Media Material and Method	Country/ Region	Theoretical Perspective	Representational Strategy	National-Meaning Construct	Key Finding
Park and Shin (2023)	Sarah Murray; PyeongChang 2018	South Korean media; critical discourse analysis	South Korea	Olympic nationalism; gender; whiteness	Familial ties, hierarchy, and credibility	Olympic nationalism	Media representation reproduces national hierarchy, gendered authority, and whiteness.
Zhang and Caple (2021)	Li Na news coverage	Four English-language news outlets; corpus assisted discourse analysis	China, United Kingdom, Australia, United States	Discursive news values	Individualism/ collectivism and national responsibility	Nationalism	Chinese and international outlets position Li Na differently within competing sports systems.

Source: Authors' own work

Table 5
Conceptual distinctions in the reviewed literature

Construct	Main Analytical Focus	Relationship to Other Constructs	Illustrative Studies
Sport nationalism	The connection between athletes, sporting success, and events with national pride, reputation, values, or collective memory.	A form of nationalism expressed through sport and media representation.	Kim (2024); Yang and Lin (2023); McCree (2022); Ziaee et al. (2021).
National identity	Shared ideas about who "we" are as a national community.	Broader than sport's nationalism; sport becomes one setting in which national identity is articulated.	Zhang and Shi (2024); Chen and Chiang (2023); Ziaee et al. (2021).
National belonging and representation	The conditions under which people are accepted, questioned, or excluded as national representatives.	Focuses on boundaries of membership and often intersects with race, gender, citizenship, migration, and refugee status.	Mauro (2025); Latififard et al. (2024); Choi (2023); Park and Shin (2023).
Nationalist narratives and discourse	Media language, images, and storylines through which national meaning is communicated.	A communicative form that may express sport's nationalism, national identity, or contested belonging.	Humayun (2023); Kramareva and Grix (2023); Zhang and Caple (2021).
Cosmopolitan nationalism	National identification articulated alongside openness to transnational or multicultural identities.	Differs from exclusionary forms of national belonging, although inclusion may remain conditional.	Kobayashi et al. (2023).
Banal nationalism	Routine and often unremarked national cues in media communication.	Distinct from overt nationalist claims; retained as an analytical distinction rather than a dominant framework in the final corpus.	Not a principal framework in most included studies.

Source: Authors' own work

Some studies examine nationalism in transnational contexts. Zhang and Shi (2024), Kobayashi et al. (2023), and Kramareva and Grix (2023) show that national identity can be shaped through international comparison, cosmopolitan ideas, soft power competition, and the representation of other nations. These studies suggest that national meaning is not fixed. Instead, it changes through media representation and interaction across national borders.

RQ2: Narrative Strategies in Sports Coverage

Across the 14 reviewed studies, three recurring ways of linking sport to national meaning became apparent: heroic representation, binary opposition, and emotional mobilisation. These categories were developed by combining a predefined focus on representational strategy with an inductive comparison of the findings reported in each study. The categories were not mutually exclusive, and some studies supported more than one strategy.

Heroic representation was identified in seven studies: Kim (2024), Latififard et al. (2024), Yang and Lin (2023), Chen and Chiang (2023), McCree (2022), Zhang and Caple (2021), and Ziaee et al. (2021). This strategy portrays athletes or teams as symbols of national strength, moral value, sacrifice, achievement, or collective aspiration. Kim (2024) shows how Korean media linked football success with sacrifice and personal achievement. Ziaee et al. (2021) identify heroic comparisons, courage, unity, and determination in Iranian football reporting. Yang and Lin (2023) show how CCTV represented Paralympic champions as national heroes. In these studies, sporting achievement is linked to national identity, collective history, and national reputation.

Binary opposition was identified in seven studies: Mauro (2025), Zhang and Shi (2024), Latififard et al. (2024), Humayun (2023), Chen and Chiang (2023), Kramareva and Grix (2023), and Zhang and Caple (2021). This strategy constructs national identity through contrast with an external national, cultural, or geopolitical other. Examples include journalists' posts about India and Pakistan during cricket, Taiwanese online communication that distinguished Taiwan from China, Chinese and US coverage of Eileen Gu, Iranian media categorisation of Kimia Alizadeh, UK and US representations of Russian Olympic ceremonies, and English and Italian coverage of Euro 2020. These studies show how media texts may construct an "us" and "them" relationship through geopolitical comparison, race, citizenship, or contrasting sporting systems. However, this pattern should be understood in relation to the specific contexts examined and not as a universal feature of sports-media coverage.

Emotional mobilisation was identified in eight studies: Kim (2024), Zhang and Shi (2024), Latififard et al. (2024), Yang and Lin (2023), Chen and Chiang (2023), Humayun (2023), McCree (2022), and Ziaee et al. (2021). It refers to the use of pride, unity, loss, recognition, or other affective appeals to connect sport with national meaning.

Chen and Chiang (2023) show how Olympic success generated collective joy and online mobilisation in Taiwan. Humayun (2023) identifies pride and jubilation in sports journalists' posts during the India-Pakistan cricket final. Latififard et al. (2024) show how media and public communication constructed affective responses to Kimia Alizadeh's Olympic match. Such appeals may also intersect with gender, race, refugee status, and contested forms of national belonging.

The three strategies were not expressed in the same way across all studies. They depend on sports events, media content types, and national background. Most of the published studies focus on a single case or a small number of media texts. Therefore, these research results are more suitable for comparing specific contexts than making generalisations about the universality of sports media.

RQ3: Theoretical Perspectives, Research Subjects, and Methodological Approaches

Critical discourse analysis, textual analysis, and qualitative content analysis are the main methods used in the reviewed studies. The studies draw on different perspectives, including sport nationalism, national identity, transnationalism, critical multiculturalism, race and racialisation, discursive news values, the social model of disability, and soft power. Although these approaches examine different issues, they are complementary. Studies of media language and narratives examine how national meaning is constructed, while studies of identity, belonging, race, gender, and citizenship examine who is included or excluded from that meaning. Transnational approaches examine how national meaning is shaped through international comparison. This diversity allows the field to address different aspects of nationalism in sports media, but it also makes direct comparisons between studies more difficult.

The studies cover East Asia, South Asia, the Middle East, the Caribbean, Europe, and North America. The Olympic Games, the World Cup and other international competitions are common research backgrounds. Some studies have also examined historical news reports, domestic television, and news about individual athletes. This shows that major sports events remain an important research focus, and researchers are also investigating a wider range of media and national contexts.

Most studies clearly describe their media data, analytical methods, and main findings. However, researchers rarely explain their own position or discuss reflexivity. Some studies have not clearly stated their qualitative research perspectives. Therefore, the existing evidence helps to understand how sports media presents the meaning at the national level, but cannot explain how the audience receives the information, what impact the information will have, and the prevalence of these models among different countries.

DISCUSSION

Taken together, the reviewed studies suggest that nationalism in sports reporting is neither uniform nor limited to overt patriotic celebration. Its form varies according to the event, media outlet, and social and political context of reporting. Sport nationalism may provide shared emotional experiences and symbolic resources for collective identification, particularly through representations of heroic athletes and national achievement (Kim, 2024; Yang & Lin, 2023; Ziaee et al., 2021). At the same time, media representations of nationalism may be exclusive or hierarchical. Race, gender, immigration, citizenship, and refugee status can shape who is recognised as a legitimate member or representative of the national community (Choi, 2023; Latififard et al., 2024; Mauro, 2025; Park & Shin, 2023).

The studies also suggest that media institutions and reporting practices can shape how national meaning is presented. These differences should be understood in their specific historical, political, and cultural contexts, rather than as fixed characteristics of particular media systems.

The studies use different theoretical approaches because they examine different aspects of nationalism in sports media. Discourse-based approaches show how national meaning is constructed through media language and narratives. Studies of identity, race, gender, citizenship, and migration show how these meanings may include or exclude particular groups. Transnational perspectives further indicate that national meaning may be shaped through comparison with other countries. These approaches are complementary, but few studies connect media representation with journalistic practice, platform circulation, and audience response.

Against this contextual variation, the three narrative strategies identified in the review should be understood as analytical patterns within a small and heterogeneous corpus, rather than as stable features of sports-media reporting across settings. The available evidence does not establish that heroic representation, binary opposition, or emotional mobilisation are equally prevalent across national contexts, sports, or media systems. This caution is particularly important because several studies provide limited information about researcher positioning and because the corpus consists primarily of case-based analyses of specific events and media texts.

The review identifies three priorities for future research. First, few studies examine audience responses; therefore, there is limited understanding of how audiences interpret, accept, question, or share mediated national meanings. Second, comparative research across countries and media environments remains limited. Third, further research is needed on how news content, user participation, and algorithmic visibility interact on digital platforms.

Future studies could combine textual analysis with audience-centred methods, including interviews, focus groups, questionnaires, and experiments.

Comparative research across platforms and national contexts could also provide a fuller understanding of how media institutions, platform features, and sporting events shape the representation and reception of nationalism-related narratives.

CONCLUSION

The 14 articles reviewed show that sports media reporting can give national significance to athletes, competitive performance, and competitions. Heroic narratives, international comparisons, emotional language, and debates about belonging are common means of achieving this goal. Issues such as race, gender, immigration, citizenship, disability, and geopolitics are not marginal factors in these processes. In many studies, these issues affect who is considered a national representative and how the nation is represented.

IMPLICATION OF THE STUDY

Several characteristics of this review limit the scope of its conclusions. The scope of retrieval is limited to the Web of Science and ScienceDirect. Relevant literature indexed only in other databases may therefore not have been retrieved. This database boundary may particularly limit the retrieval of studies indexed exclusively in specialist sport, communication, or regional sources. In addition, the English-language requirements and the publication time limit from January 2021 to April 2025 also exclude studies published in other languages or at different times, including studies that may provide different historical or geographical perspectives.

A total of 14 articles were finally included. There are significant differences in these studies in terms of location, sports events, media materials, time periods, and research methods. Therefore, the comparison is explanatory rather than statistical. Initial title and abstract screening were undertaken by one reviewer. Therefore, some risk of selection bias remains despite the independent verification of full-text eligibility, coding, and appraisal decisions. The two-concept search strategy broadened the retrieval process, but relevant studies may still have used terms that were not included in the search.

The Joanna Briggs Institute (JBI) based appraisal strengthens transparency about the included evidence but does not remove the limitations associated with reporting differences and interpretive, case-based research. These constraints mean that the review offers a structured and context sensitive synthesis rather than definitive claims about global sports media systems.

LIMITATION AND RECOMMENDATION FOR FUTURE RESEARCH

The reviewed studies suggest that sports-media reporting can connect athletes and sporting events with national values, while also shaping the boundaries of national belonging. This conclusion is based on case-specific analyses of media texts. The reviewed evidence does not establish how audiences respond to these representations or

whether particular professional interventions can change them.

On the basis of these findings, journalists and media practitioners could consider how opponents, migrants, women athletes, racialised athletes, and athletes with disabilities are represented in sports reporting. Sport-management institutions and policymakers could also encourage communication around major events that does not treat athletes or competitive success as simple proof of national superiority. These are cautious normative considerations arising from the synthesis, rather than recommendations directly tested by the studies included in this review.

Future research could combine media content analysis with interviews, surveys, focus groups, experiments, or digital-trace data to examine how audiences interpret and respond to mediated national meaning. Comparative research across countries, platforms, and event types could also help distinguish patterns linked to particular cases from those that may be found across different settings.

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REFERENCES

Abe, T. (2025). Cambodia's soft power strategy: Hosting the 2023 Southeast Asian Games. *International Journal of Sport Policy and Politics, 17*(2), 237-252. https://doi.org/10.1080/19406940.2024.2424578

Abu-Salih, B., & Alotaibi, S. (2024). A systematic literature review of knowledge graph construction and application in education. *Heliyon, 10*(3), Article e25383. https://doi.org/10.1016/j.heliyon.2024.e25383

Billig, M. (1995). *Banal nationalism*. SAGE Publications. https://doi.org/10.4135/9781446221648

Burgess, J., & Hurcombe, E. (2019). Digital journalism as symptom, response, and agent of change in the platformed media environment. *Digital Journalism, 7*(3), 359-367. https://doi.org/10.1080/21670811.2018.1556313

Chen, T. H., & Chiang, Y. (2023). The Tokyo 2020 Olympic Games and the performativity of sport nationalism: Taiwanese identity and online mobilization. *National Identities, 25*(4), 407-421. https://doi.org/10.1080/14608944.2023.2220283

Choi, Y. (2023). The Olympics, nationalism, and multiculturalism: News coverage of naturalized players in the Korean men's national ice hockey team. *International Review for the Sociology of Sport, 58*(4), 666-684. https://doi.org/10.1177/10126902221147466

Entman, R. M. (1993). Framing: Toward clarification of a fractured paradigm. *Journal of Communication, 43*(4), 51-58. https://doi.org/10.1111/j.1460-2466.1993.tb01304.x

Goffman, E. (1974). Frame analysis: An essay on the organization of experience. *Harvard university press.*

Han, Y., Huang, J., & Li, B. (2023). Comparison and analysis of mainstream media in Chinese and foreign news coverage: The 2022 Beijing Winter Olympics as an example. *International Journal of Social Science and Education Research, 6*(8), 328-338. https://doi.org/10.6918/IJOSSER.202308_6(8).0045

Hartmann, D. (2023). Ethnonationalist engagements, historic norms, and the politics of sport in American culture. *Journal of Sport History, 50*(2), 165-186. https://doi.org/10.5406/21558450.50.2.03

Ho, M. H., & Lim, W. (2023). Asian sporting masculinities in figure skating: Media representations of Nathan Chen and Yuzuru Hanyu as rivals. *Media, Culture & Society, 45*(3), 561-577. https://doi.org/10.1177/01634437221140522

Humayun, M. F. (2023). Construction of mediated national identity through sports journalists Twitter feed. *Communication & Sport, 11*(2), 385-401. https://doi.org/10.1177/21674795211045990

Jia, K., Zhu, Y., Zhang, Y., Liu, F., & Qi, J. (2022). International public opinion analysis of four Olympic Games: From 2008 to 2022. *Journal of Safety Science and Resilience, 3*(3), 252-262. https://doi.org/10.1016/j.jnlssr.2022.03.002

Kim, W. (2024). How has the media's construction of a discourse of nationalist evolved? Critical discourse analysis of Korean sports nationalist through the FIFA World Cup. *International Review for the Sociology of Sport, 59*(3), 421-437. https://doi.org/10.1177/10126902231208849

Kobayashi, K., Horne, J., & Lee, J. W. (2023). Sports mega-events and cosmopolitan nationalism: A critical discourse analysis of media representations of Japan through the 2019 Rugby World Cup. *International Review for the Sociology of Sport, 58*(8), 1305-1325. https://doi.org/10.1177/10126902231167097

Kramareva, N., & Grix, J. (2023). Understanding Russia's identity through Olympic ceremonies. *European Journal for Sport and Society, 20*(1), 79-100. https://doi.org/10.1080/16138171.2022.2031518

Latififard, M., Billings, A. C., Sadri, S. R., & Yadegari, A. (2024). "Compatriot" or "stateless": Iranian state-owned media and social media depictions of Iranian refugee Kimia Alizadeh's match at the Tokyo Olympic Games. *Sociology of Sport Journal, 41*(2), 180-192. https://doi.org/10.1123/ssj.2023-0019

Liu, Z., Ye, C., Chen, R., & Zhao, S. X. (2021). Where are the frontiers of sustainability research? An overview based on Web of Science database in 2013-2019. *Habitat International, 116*, Article 102419. https://doi.org/10.1016/j.habitatint.2021.102419

Lockwood, C., Porritt, K., Munn, Z., Rittenmeyer, L., Salmond, S., Bjerrum, M., Loveday, H., Carrier, J., & Stannard, D. (2024). Systematic reviews of qualitative evidence. In E. Aromataris, C. Lockwood, K. Porritt, B. Pilla, & Z. Jordan (Eds.), *JBI manual for evidence synthesis*. JBI. https://doi.org/10.46658/JBIMES-24-02

Markus, H. R., Uchida, Y., Omoregie, H., Townsend, S. S. M., & Kitayama, S. (2006). Going for the gold: Models of agency in Japanese and American contexts. *Psychological Science, 17*(2), 103-112. https://doi.org/10.1111/j.1467-9280.2006.01672.x

Mauro, M. (2025). Contrasting media representations of race and national identity: The case of England and Italy at the Union of European Football Associations Euro 2020. *European Journal of Cultural Studies, 28*(2), 472-492. https://doi.org/10.1177/13675494241245632

McCree, R. (2022). Netball nationalism in Trinidad and Tobago: Content analysis of press coverage related to the 1979 World Netball Tournament. *The International Journal of the History of Sport, 39*(13-14), 1484-1505. https://doi.org/10.1080/09523367.2021.1996353

Mihelj, S., & Jiménez-Martínez, C. (2021). Digital nationalism: Understanding the role of digital media in the rise of 'new' nationalism. *Nations and Nationalism, 27*(2), 331-346. https://doi.org/10.1111/nana.12685

Mutz, M., & Gerke, M. (2024). National pride effects of major sporting events. In H. Solberg, R. K. Storm, & K. Swart (Eds.), *Research handbook on major sporting events* (pp. 485-497). Edward Elgar Publishing. https://doi.org/10.4337/9781800885653.00047

Park, D., & Shin, N. (2023). Branded media representations of Coach Sarah Murray: The intersection of Olympic nationalism, gender, and Whiteness in ice hockey. *Journal of Sport and Social Issues, 47*(1), 36-55. https://doi.org/10.1177/01937235221134606

Roche, M. (2002). The Olympics and 'global citizenship'. *Citizenship Studies, 6*(2), 165-181. https://doi.org/10.1080/13621020220142950

Sasao, S. (2024). 'Discourse of nationalism' in sports media: Focusing on newspaper coverage of World Baseball Classic 2023. *International Journal of Sport and Health Science, 22*, 108-122. https://doi.org/10.5432/ijshs.202406

Swart, K., & Hussain, U. (2023). FIFA 2022 World Cup in Qatar: Under the gaze of Western media. In *Sports mega-events in Asia* (pp. 199-222). Springer Nature Singapore. https://doi.org/10.1007/978-981-99-0011-4_9

Weber, R. (2021). Banal Europeanism? Europeanisation of football and the enhabitation of a Europeanised football fandom. *Sport in Society, 24*(11), 1893-1909. https://doi.org/10.1080/17430437.2021.1893697

Yang, L., & Lin, Z. (2023). The national hero, the supercrip, and the self-reliant figure: Paralympic champions on China Central Television's sports channel. *Sport in Society, 26*(9), 1477-1491. https://doi.org/10.1080/17430437.2022.2147064

Zhang, L., & Caple, H. (2021). The newsworthiness of Li Na—A critical comparative analysis of Chinese and international news media. *Language & Communication, 77*, 70-80. https://doi.org/10.1016/j.langcom.2021.01.002

Zhang, L., & Shi, L. (2024). The "Descendant of Dragon" or an "American Dreamer"? The flow of identity in the media discourse of Eileen Gu between China and the US. *Communication & Sport, 12*(1), 63-80. https://doi.org/10.1177/21674795231193400

Ziaee, A., Adib-Moghaddam, A., Elling, A., van Sterkenburg, J., & van Hilvoorde, I. (2021). Football and the media construction of Iranian national identity during the FIFA World Cup 2018 and AFC Asian Cup 2019. *Soccer & Society, 22*(6), 613-625. https://doi.org/10.1080/14660970.2021.1952691

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Integrating Meaningful, Mindful, and Joyful Learning to Enhance Academic Achievement and Cognitive Flexibility Among Indonesian Elementary Students Through a Mixed-Methods Design

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ABSTRACT

With deep learning now a focus across the globe, students are no longer required only to perform well academically; they are also expected to 'demonstrate higher-order thinking skills', such as those described by the concept of cognitive flexibility. However, teaching in Indonesian elementary schools remains centered on rote memorisation, which offers students few opportunities for flexible and adaptive thinking. Although the meaningful, mindful, and joyful aspects of learning have to some extent been studied independently in the literature, few studies have integrated them. Aims and objectives: This study evaluated the impact of Meaningful, Mindful, and Joyful (MMJ) Learning on elementary students' academic achievement and cognitive flexibility using an explanatory sequential mixed-methods design. One hundred fifth-grade students participated in the study. Quantitative data were collected through a pretest, two formative assessments, and a posttest in five subjects, and qualitative data through interviews and classroom observations. The results showed that the experimental group achieved significantly higher posttest scores than the control group (mean difference = 12.28 points), with a large effect size (Cohen's d = 0.87). Analysis of achievement indicated that 84% of the students in the experimental group earned high-level grades. Findings: Participants proceeded through five stages of the MMJ learning cycle: meaningful experience, joyful engagement, mindful reflection, strategic exploration, and collaborative consolidation.

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The MMJ model improved academic performance and cognitive flexibility, providing a teachable structure for developing deep learning in primary education.

Keywords: Cognitive flexibility, joyful learning, meaningful, mindful

INTRODUCTION

Cognitive flexibility is a key 21st-century skill that equips students to respond to difficult and uncertain situations. It is defined as the capacity to adapt strategies to changing demands; to pay attention to one's own thinking process, and to evaluate and control cognitive processes. This is a key skill in problem-solving, as it enables students to change tack, consider multiple perspectives, and take context into account (Bougherra et al., 2023; Lai et al., 2023; Wang et al., 2024). Cognitive flexibility is also a core component of executive functions, which develop rapidly during childhood (Legare et al., 2018) and are closely linked to children's success in school (Diamond, 2013). In elementary school, where students build foundational knowledge and thinking habits on which later learning depends, the ability to shift between strategies and approach a problem from multiple angles is particularly important. It has been associated, for example, with Indonesian elementary students' understanding and application of mathematical concepts (Rahayuningsih et al., 2025). Academic achievement, in turn, reflects how well students master core curricular content and provides the foundation for their later schooling. Because learning is meant to go beyond mere procedural recall, cognitive flexibility and academic achievement are best developed together rather than treated as separate goals.

Various studies have reported that elementary school students show limited cognitive flexibility. Many factors contribute to this, one of them being the continued use of traditional teaching methods (procedural memorisation and linear problem solving). Such procedures restrict students' exploration and hinder the generation of more diverse and creative thinking strategies (Agbele et al., 2020; Kuluşaklı, 2025; Liu, 2023). Consequently, students tend to rely on conventional methods and show reluctance to experiment with more efficient or innovative alternatives (Campanati et al., 2022; Rivkin & Gim, 2013). Cognitive flexibility plays a vital role in learning elementary mathematics, including solving open-ended questions and contextual problems (e.g., word problems, comparing fractions, estimating sizes, and interpreting data). It is also relevant to other subjects, such as Science, Indonesian Language, Civic Education, and Arts & Culture, which often require cross-disciplinary application of knowledge. For example, problem solving in Science may involve measurement skills, and story-based questions in Indonesian Language may carry mathematical ideas.

Open and Reflective Learning Environment. To promote cognitive flexibility, students must learn in active, reflective environments that encourage collaboration, inquiry, and evaluation of strategies. Previous studies have found that problem-based learning, inquiry learning, technology-integrated instruction, and project-based education can promote adaptive thinking skills (Maharani et al., 2023; Oishi et al., 2018; Sandika & Fitrihidajati, 2018). Building on this groundwork, Meaningful, Mindful, and Joyful (MMJ) learning has emerged as a promising approach. MMJ combines meaningful learning (relating content to prior experience), mindful learning (raising reflective awareness), and joyful learning (engaging students emotionally through play). It facilitates cognitive and emotional engagement and builds strategic awareness, contributing to a psychologically safe classroom that encourages experimentation (Atrup et al., 2023; Kaur & Rosli, 2021; Lin et al., 2020).

However, despite these theoretical benefits, limited empirical evidence is available on the simultaneous effects of MMJ on academic achievement and cognitive flexibility. It is unclear whether students taught through MMJ differ substantially from those taught through traditional lecture-based instruction, how large the effect of MMJ is across elementary school subjects and across High, Middle, and Low Range Marks (i.e., the distribution of student achievement), and whether grouping strategies or collaboration preferences affect its effectiveness. Additionally, we know very little about how MMJ influences cognitive flexibility by combining cognitive, affective, and social factors.

Hence, the present study attempts to fill these gaps by exploring the impact of MMJ-based teaching in elementary education. Its goals are to investigate achievement differences between MMJ and lecture-based instruction at posttest, to measure the effect size of MMJ on student outcomes, to analyse the distribution of achievement and the role of group dynamics, and to explore how the process-oriented nature of MMJ learning fosters cognitive flexibility through the interplay of cognitive, affective, and social dimensions.

LITERATURE REVIEW

Cognitive Flexibility in the Context of Elementary Education

Cognitive flexibility represents an individual's tendency to shift frames of reference or adopt new rules to solve problems, understand novel information, and reorient oneself to environmental changes. In primary education, it is one of the most essential components in training higher-order cognitive skills such as creativity, problem solving, and decision making.

This study uses three indicators of cognitive flexibility at the primary level, developed by Rahayuningsih et al. (2025): (1) cognitive novelty, the ability to generate new strategies when facing a problem; (2) cognitive variety, the ability to use various approaches to solve a problem; and (3) cognitive framing, the ability to reflect

upon a problem and reframe it in a deeper, more contextual way.

Previous research indicates that cognitive flexibility does not emerge naturally. It needs to be developed through cognitive experiences that are situated, interactive, and stimulating. Learning contexts in which students can consider ideas, reflect on their own thinking, and be emotionally engaged are more likely to support the development of deep and sustained cognitive flexibility.

Purposefully designed learning experiences are important for developing cognitive flexibility. Pedagogical approaches featuring games, simulations, or project-based learning have been shown to have a strong influence on the early development of executive functions and critical thinking (Garzón et al., 2020). These interactive, challenging, personally relevant activities establish a context for learning that prompts students to think flexibly (Legare et al., 2018). Interventions that aim to promote cognitive flexibility should therefore encourage exploration, support emotional engagement, and link learning content to students' life experiences. When students engage in multiple ways of thinking, when the learning connects to their own world, and when they can make meaning for themselves from that process, they will be better equipped to approach later challenges flexibly.

Research also emphasises the need for flexible, responsive learning settings that accommodate students' needs. Instructional techniques that create opportunities for reflection, personal relevance, and active engagement are more likely to support the development of enduring cognitive flexibility (Legare et al., 2018). Additionally, adaptive learning technologies have been found to improve cognitive flexibility among students with special needs (Alqudah & Khasawneh, 2024).

Hence, promoting cognitive flexibility in elementary students requires specific types of instruction and experience that encourage cognitive novelty, variety, and framing. These can be achieved through engaging, reflective, contextually based learning and activities connected to students' life experiences, enabling them to think critically, adaptively, and creatively when they encounter complex and uncertain learning conditions.

The MMJ (Meaningful, Mindful, Joyful) Learning Approach

Meaningful, mindful, and joyful learning together form a well-rounded pedagogy in which students experience learning with full involvement, both cognitively and affectively. This view encourages understanding, reflection, and emotion in the classroom, so that learning is not only cognitive but also meaningful and emotionally fulfilling.

Meaningful Learning

Meaningful learning happens when students can relate new information to what they already know, which enables the formation of deep conceptual understanding and personal meaning in relation to the subject matter.

When knowledge is connected to previous experiences or schema, learners move beyond rote learning and begin to construct meaning, which makes the knowledge applicable and meaningful (Farida & Rasyid, 2019; Genc, 2015). This is consistent with Ausubel (1963), who argued that learning can be meaningful only to the extent that it relates in an organised and systematic way to what the student already knows.

In classroom practice, as articulated in the MMJ (Meaningful, Mindful, Joyful) model, meaningful learning principles are implemented by connecting academic concepts directly to students' real-world experiences. For instance, when teaching food webs and economic activity, students might be asked to take an inventory of their local environment, study living populations or crops, and present the results in tables or graphs. These activities not only strengthen interdisciplinary understanding (Science and Mathematics) but also build intellectual bridges between school-based content and students' real-life interests.

Project-based learning is a tangible example of a meaningful learning experience that allows students to engage deeply with concepts in social, emotional, and personal contexts. Environmental conservation projects or local economic management projects, for example, involve problem solving and collaboration and thereby create opportunities to construct meaning through active involvement (Nawawi et al., 2021; Nuha et al., 2020). These assignments promote creative and critical thinking, encourage personal expression, enhance motivation for student work, and foster student reflection on the learning process.

Such learning is more than cognitive, involving affective and metacognitive dimensions. Activities such as reporting on their work, talking about their thinking, and presenting their outputs introduce students to why and how they learn, a key element of strategic awareness. When learners are able to explain their reasoning and defend their chosen methods, the learning becomes deeply internalised and situated (Mărcuș et al., 2022; Piscayanti, 2021).

Therefore, project-based activities and real-world connections that give learning meaning can contribute to the development of students' cognitive flexibility, helping them apply these 21st-century skills after first understanding, reflecting on, and personally relating to what they are taught.

Mindful Learning

Mindful learning focuses on increasing students' awareness of the learning process itself, and of how they think, feel, and respond to demands. This metacognitive involvement helps learners think consciously about their thinking processes and decisions. Such activities foster intentionality in learning and flexibility in problem solving (Barhoumi & Rossi, 2020; Gabrys et al., 2018).

In the present study, mindful learning was mediated by activities that involved active self-monitoring of students' thinking. This could involve students writing daily reflective diaries, talking about the strategies they were using, and commenting on

changes in their understanding as they engaged in the learning challenge. Students were also prompted to compare different solution strategies, identify mistakes, and critically evaluate the effectiveness of their choices in solving problems (Bakosh et al., 2016). Such activities help students understand not only what they are doing but also how and why they understand it as they do.

This reflective process is consistent with the notion of present awareness and mindful attention in learning. Students explicitly attend their own cognitive activity, feelings, difficulties, and strategies while they learn. Such metacognitive awareness provides an important basis for acquiring cognitive flexibility, that is, knowing when to shift strategies and how best to do so.

Mindful learning is known to contribute to cognitive flexibility by cultivating reflective behaviour, resilient problem solving, and open-mindedness toward uncertainty in the learning experience (Diamond, 2013; Gabrys et al., 2018). For this reason, mindful learning in the present study is a pedagogical practice for developing strategic awareness and adaptive thinking among elementary school children, rather than simply a method of assessing understanding.

Joyful Learning

Joyful learning is not only the creation of an emotionally positive learning environment but also the nurturing of deep affective engagement, on which intrinsic motivation and students' self-confidence are based. Learners who feel safe and valued as individuals in the classroom, and whose teachers use actively engaging activities, are likely to be enthusiastic, curious, and open to new ideas (Rhodes & Rozell, 2017; Salmawati, 2023). An encouraging learning atmosphere also strengthens relationships among students and teachers, which builds a supportive and cooperative learning community.

In this research, principles of joyful learning were incorporated into the design through techniques that focused on creative methods, teamwork, and applied learning. The students worked on projects such as environmental campaigns, processing real-world observation data, and creative media using posters, infographics, and visuals. These projects enabled students to have a voice and to work with others, as they felt their contributions mattered. By building such active learning activities around students' interests and enjoyment, learning was no longer experienced as something formal that students approached with apprehension.

Theoretically, joyful learning contributes to cognitive flexibility by enabling learners to experiment with various methods of problem solving without fear of failure. In a non-threatening and friendly learning environment, students are more likely to feel free to try new ideas, ask questions, and change their thinking (Aska et al., 2022; Nawawi et al., 2021). This bolsters their flexibility in the face of complex, unstructured learning tasks.

The "fun of learning" also strengthens emotional attachment to content, which supports lasting concept comprehension and knowledge retention. Positive learning experiences become part of a way of thinking that supports meaning making and reflection and is directly related to the construction of cognitive flexibility.

Relationship Between MMJ Learning and Cognitive Flexibility

The MMJ (meaningful, mindful, and joyful) approach has shown promise for promoting not only academic achievement but also cognitive flexibility in elementary students. In this investigation, meaningful learning supported the building of deep cognitive pathways when academic content was linked to students' personal contexts, allowing them to solve problems within an authentic frame with the relevant prior knowledge in place. Training in mindful awareness for self-regulation was designed to foster continuous reflection, monitoring, and control of cognition, and this training facilitates deliberate strategic action for adaptive problem solving. Joyful learning created a psychologically safe and affectively engaging classroom context, where students were encouraged to 'try out' different strategies and explore alternative viewpoints without fear of failure.

When combined, these dimensions form an interconnected learning environment that actively encourages students to (1) generate fresh strategies (cognitive novelty), (2) employ multiple methods for solving a single problem (cognitive variety), and (3) reframe problems in more profound, contextually authentic ways (cognitive framing). The quantitative results of the present study demonstrated that MMJ learning led to a statistically and practically significant improvement in students' learning achievement across different subjects, as many students moved to a higher category in their final assessments. The qualitative analysis also revealed an emergent process of cognitive flexibility formation occurring through five interconnected phases: meaningful experience, joyful engagement, mindful reflection, strategic exploration, and collaborative consolidation. These phases show how cognitive, affective, and social aspects interact in practice to foster flexible, creative, and adaptive thinking.

Although research on flexible thinking is expanding rapidly, few studies have charted this developmental process within an integrated MMJ approach, especially in elementary schools. This study addresses that gap by combining quantitative outcome measures with qualitative grounded theory analysis, providing empirical evidence of effectiveness and a conceptual model of how MMJ learning promotes sustained cognitive flexibility in young learners.

Taken together, the literature reviewed above indicates that meaningful, mindful, and joyful learning are consistently associated with gains in cognitive flexibility, yet their combined and simultaneous contribution to academic achievement has rarely been examined within a single framework. Unlike prior project-based or inquiry-based interventions that have

primarily targeted either cognitive flexibility or content mastery in isolation (Maharani et al., 2023; Oishi et al., 2018; Sandika & Fitrihidajati, 2018), the MMJ approach in this study was deliberately designed to integrate the three dimensions into one recursive instructional cycle in which meaning-making, metacognitive reflection, and positive affect operate together to drive both cognitive flexibility and measurable academic achievement across five subject areas. This integrated positioning constitutes the novelty of the present study: rather than treating meaningful, mindful, and joyful learning as separate pedagogical add-ons, MMJ is conceptualised and empirically tested as a single, mutually reinforcing framework that explains how process-level cognitive change (cognitive flexibility) translates into outcome-level academic achievement, a link that has not been previously established in elementary education research.

METHODOLOGY

Research Design

In this research, a sequential explanatory mixed-methods design was used, in which the quantitative study preceded the qualitative study. The purpose was to reveal not only the measurable outcomes of MMJ learning but also the process through which those outcomes were achieved. The quantitative strand was employed to determine the statistical influence of MMJ on students' academic performance, and the qualitative strand was intentionally incorporated to explain, elaborate, and situate the quantitative results. Both strands contributed to the overall study; however, more analytical emphasis was placed on the quantitative results, to build explanatory depth and detailed insight into how the MMJ approach led to cognitive flexibility in natural classroom environments. This methodological orientation is consistent with the explanatory role of mixed-methods research, in which qualitative inquiry acts as an interpretive lens that illuminates and extends quantitative findings (Creswell & Plano Clark, 2018; Tashakkori et al., 2012). It should be clarified that, although the overarching orientation of the study was explanatory, the quantitative strand itself employed a quasi-experimental structure comparing a treatment and a control group. Following Creswell and Plano Clark's (2018) typology of mixed-methods designs, this configuration is more precisely classified as an Experimental Embedded Mixed Methods design, in which qualitative data are embedded within a quasi-experimental framework to explain and enrich the interpretation of the intervention's effects, rather than a purely sequential explanatory design without an experimental component. The term "explanatory" used throughout this paper therefore refers to the interpretive function of the qualitative strand, while the underlying quantitative structure remains quasi-experimental in nature.

To address the outcome- and process-related research questions, a quasi-experimental design was combined with Constructivist Grounded Theory. The quasi-experimental design allowed for comparison

between a treatment group taught using MMJ and a control group taught conventionally through lectures, thus providing data-based evidence of learning gains. Nevertheless, acknowledging that cognitive flexibility is a multidimensional construct that goes beyond the sum of test scores, the qualitative phase focused on students' reasoning processes, their reflective consciousness, strategic adjustments and emotional involvement in learning. This approach treated the qualitative results as essential, rather than supplementary, for explaining how MMJ instruction influenced students' flexibility of thought.

The quantitative strand used a nonequivalent control group design with two intact fifth-grade classrooms because site constraints made random assignment impractical (a common feature of field-based educational research; Campbell & Boruch, 1975). After the intervention and statistical analysis, a qualitative phase was implemented to explain why the experimental group outperformed the control group and to build a process model describing the development of cognitive flexibility during MMJ-based learning. Both strands were then integrated at the interpretation level through meta-inferences that systematically related quantitative patterns to qualitative explanations, producing a coherent and theoretically grounded picture of MMJ as a pedagogical approach.

Participants. The experiment involved 100 fifth-grade students of the primary level (10-12 years) from two elementary school classes. Five subject teachers and one principal served as qualitative informants. Purposive sampling was used to ensure that the educational setting was relevant to the research purpose. The selected school had instructional features consistent with the needs of the study, including periodic thematic-integrative learning and institutional support for pedagogical innovation. The use of intact classrooms reflected the naturalistic classroom environment, maintained ecological validity (Tanaka et al., 1996), and was appropriate for a school-based intervention study, where random reassignment is frequently not feasible (Teddlie & Yu, 2007).

The two groups were designated as the experimental group (n = 50), which was learned through MMJ, and the control group (n = 50), which was taught using the traditional lecture method. The non-random selection enabled comparability between groups in terms of class level, teacher competence, and instructional materials, with minimal contamination across groups. The involvement of teachers and the principal as qualitative informants enhanced situated knowledge by generating multiple perspectives on the school learning culture, instructional operations, and the feasibility of MMJ in real classroom contexts.

This sampling approach fit the sequential explanatory mixed-methods design because it provided both sufficient numbers for statistical analysis in the quantitative phase and information-rich cases for examining the development of cognitive flexibility in depth in the qualitative phase. This kind of sampling is common in mixed-methods

research, in which representativeness in the quantitative strand is balanced by depth and relevance in the qualitative strand (Creswell & Plano Clark, 2018).

Research Instruments

To fulfill the research design and maintain methodological complementarity between measurement and explanation, this study employed several instruments that provided both quantitative and qualitative data in accordance with the mixed-methods design. The instruments were constructed and validated to fit the research purposes of testing academic outcomes and exploring students' flexible thinking processes.

The quantitative data were obtained using an Integrated Learning Achievement Test covering five subjects: Science, Mathematics, Indonesian Language, Civic Education, and Arts and Culture. The test comprised both closed-ended questions to assess procedural accuracy and open-ended questions to examine students' reasoning and application of knowledge. The test items were developed with reference to the competency standards and curricular content specified in the Indonesian 2013 Curriculum for primary education (Ministry of Education and Culture of the Republic of Indonesia, 2013), ensuring alignment with the national curriculum. The instrument underwent content validation by a panel of educational assessment experts and was pilot-tested with students who had characteristics comparable to those of the study participants. The expert panel indicated satisfactory content validity (content validity index [CVI] = .88), and the instrument demonstrated good internal consistency (Cronbach's α = .88), supporting its use in the quasi-experimental comparison.

The qualitative tools were designed to investigate how cognitive flexibility is developed during MMJ instruction. In the first stage, teachers and students took part in semi-structured interviews that examined instructional responsiveness, strategy adaptation, emotional engagement, and learner autonomy in MMJ-based learning. These instruments were reviewed by qualitative methodologists for construct alignment and clarity and were revised after pilot interviews. Member checks were employed to enhance credibility, with participants verifying the accuracy of the interpretations of their responses.

Second, classroom observations using a checklist were conducted to record behavioural indicators of cognitive flexibility along three dimensions: cognitive novelty (creating new strategies), cognitive variety (using multiple representations), and cognitive framing (the ability to reframe tasks or shift strategies). Content validity of the checklist was confirmed by expert pedagogical review, and inter-rater reliability showed high agreement (IRR = 0.88), indicating consistent scoring between raters. These real-time process data complemented the retrospective accounts elicited in the interviews.

Supplementary tools were student reflective journals and learning artifacts (such as worksheets and project outcomes), which served as documentary evidence of

change in thinking and adaptive reasoning over time. By incorporating these measures, the study was able to capture both outcome-level and process-level evidence, which strengthened the explanatory nature of the mixed-methods design.

Data Collection Procedures

Data collection took place over six weeks following a sequential explanatory mixed-methods approach, with quantitative data collected before and after the qualitative phase to support methodological development and interpretive explanation. The procedures were designed to protect internal validity in the quantitative stage and credibility and confirmability in the qualitative stage. Institutional consent and informed consent were obtained from all participants (principals, teachers, students, and parents) before data collection, in line with ethical standards in educational research.

Quantitative data were collected in the first and sixth weeks and consisted of a pre-diagnostic test, two formative assessments administered during the intervention period, and a posttest. Both the experimental and control groups were tested with these measures under similar testing conditions to avoid testing bias. The quantitative strand of the study aimed to determine the extent of academic progress following implementation of the instructional intervention. The experimental group was taught using the Meaningful, Mindful, and Joyful (MMJ) learning model, whereas the control group was instructed traditionally. Standardised procedures and an implementation schedule were used to reduce procedural variability and increase design fidelity across the quasi-experimental phase.

After the quantitative stage, qualitative data were collected to provide insight into how MMJ-based learning leads to cognitive flexibility. Qualitative methods consisted of systematic classroom observation with a structured rubric, semi-structured interviews with students and teachers, study of student reflective journals, and collection of learning artifacts (such as worksheets or project work). Data collection took place over a series of active teaching sessions and was structured to capture real-time behavioural and cognitive traces of how students approached strategy shifts, turned to reflection, or negotiated ideas while collaborating. This approach corresponds to Creswell and Plano Clark's (2018) explanatory design, in which the qualitative stage is used to analyse and expand upon the preceding quantitative findings.

Several measures were used to maintain rigor throughout data collection. Instrument fidelity and consistency of intervention implementation were assessed using protocol adherence checks. In the qualitative component, triangulation across data sources (interviews, observations, and learning artifacts), collection procedures, and the perspectives of diverse participants was employed to enhance trustworthiness. Selected participants took part in member-checking sessions to ensure interpretive credibility, and peer debriefing was adopted

to minimise researcher bias in the qualitative analysis. Field notes and audit trails were kept enhancing transparency and procedural replicability.

This multi-method data collection design allowed the study not only to assess how MMJ learning affected student learning outcomes but also to collect the dynamic learning traces that informed the construction of cognitive flexibility. Incorporating both data sources provided a sound foundation for explanatory interpretation, with the qualitative data giving context to, and extending, the descriptive statistical patterns that emerged from the quantitative phase.

Data Analysis Procedures

Data analysis followed the explanatory logic of the design: the quantitative results were analysed first to establish statistical patterns, and the qualitative analysis was then used to provide interpretive detail and a theoretical explanation of the findings. Critical scrutiny of the methods ensured methodological consistency across the two strands and supported the integration of inferences during interpretation.

During the quantitative phase, descriptive and inferential statistics were used to explore academic achievement differences between the experimental and control groups. Descriptive statistics summarised the central tendency and distribution of scores using means, standard deviations, and gain scores at each assessment stage. The differences between groups at the pre- and posttest were tested with an independent samples t-test. Cohen's d effect sizes were also computed to assess the practical significance of the MMJ intervention, because statistical significance alone does not indicate the practical importance of an outcome in an educational setting. SPSS was used for all statistical analyses. The assumptions of normality, homogeneity of variances, and independence of observations were checked before hypothesis testing to ensure the validity of the tests.

For the qualitative analysis, we adopted the Constructivist Grounded Theory analysis (Charmaz, 2014) to clarify how cognitive flexibility was developed during MMJ-based instruction. The qualitative analysis involved three coding processes: initial coding, focused coding, and theoretical coding. The first-cycle coding involved line-by-line coding of the interview transcripts, observation notes, and student reflective journals to identify significant behaviours and thoughts related to learning. Focused coding condensed recurring ideas into analytically meaningful categories, which represented students' strategic deviation, reflective readjustment, and collaborative reasoning. Theoretical coding was then conducted to organise these categories into an explanatory model that shows the dynamic nature of how meaning-making, mindfulness, and joyful learning promoted cognitive flexibility.

To increase analytic rigor, constant comparison was used throughout the coding process to compare data sources. Triangulation of classroom observations, interviews, and learning artefacts was

employed to minimise researcher bias and strengthen category validation. Memoing supported coding by tracking analytic insights and the evolving theory. Member checking was carried out with some informants to verify the credibility of the category interpretations, and peer review among the researchers supported analytic consistency and theoretical soundness.

Quantitative and qualitative results were integrated in the interpretation phase, using the qualitative findings to explain further the mechanisms through which the MMJ intervention produced its effects. Composite displays were constructed to compare quantitative trends and qualitative themes, facilitating meta-inferences that connected achievement gains with behavioural evidence supporting cognitive flexibility. This integrative process strengthened the explanatory power of the mixed-methods design by linking outcome evidence to process-based evidence.

Trustworthiness and Validity Procedures

Several procedures were used to confirm the methodological soundness of the study and enhance the credibility and validity of both qualitative and quantitative data. In the quantitative strand, internal validity was preserved by treating the experimental and control groups equivalently, using standardised testing procedures, and controlling for selection bias by comparing baseline skills at pretest (Judd & Kenny, 1981). For instrument validity and reliability, expert judgment was used to determine the face validity of the instrument, and Cronbach's alpha ($\alpha = 0.88$), which is above the accepted cutoff point for educational measurement, was used to assess reliability. Procedural validity was enhanced by monitoring treatment fidelity to maintain adherence to the MMJ teaching model.

In the qualitative strand, the four criteria of trustworthiness outlined by Lincoln and Guba (1985) (credibility, transferability, dependability, and confirmability) shaped the analytic procedure. Credibility was established through six weeks of prolonged fieldwork, sustained focus on learning interactions, and triangulation of data sources (interviews, observations, document analysis). Member checking was carried out by sharing the draft findings with a sample of participants to ensure the accuracy of interpretations and to reduce distortion or misrepresentation of their perspectives.

Dependability was addressed through an extensive audit trail that recorded methodological choices, coding decisions, and protocol changes at each stage of the analysis. Two independent qualitative researchers participated in peer debriefing to enhance analytic transparency and minimise researcher bias. Confirmability was supported by reflexive memoing and bracketing, which reduced subjective influence on data analysis. Verbatim student quotes in the reporting conveyed participants' voices authentically.

Transferability was supported by a thick description of the teaching setting, participants, and learning interactions, which allowed readers to judge the applicability of the findings to other educational contexts. Integration validity in the mixed-methods

approach was reinforced by following meta-inference rules and interpretation procedures that ensured the data strands were aligned before interpretation, in order to limit confirmation bias. Together, these trustworthiness strategies protected the study against methodological threats and produced findings that were empirically rich and theoretically relevant.

RESULTS

Research Findings-quantitative Data Analysis

> Is there a significant difference in learning outcomes between students receiving Meaningful, Mindful, and Joyful Learning (MMJ) instruction and those taught using the lecture method?

The comparison of pretest and posttest mean scores shows that both groups had relatively equivalent initial abilities (a difference of only 1.56 points): the control group averaged 57.13 and the experimental group 55.57 on the pretest (Table 1).

Based on Table 1, the two groups started with nearly the same initial ability (only 1.56 points difference in the pretest). After the intervention, the experimental group scored much higher on the posttest, with a mean of 12.28 points higher than that of the control group.

Following the MMJ-based learning intervention, the experimental group's posttest scores increased substantially (12.28 points higher than the control group), indicating a positive effect of MMJ on learning outcomes. An independent samples t-test (Table 2) confirmed that there was no significant difference in pretest scores ($p = 0.060$), but a statistically significant difference in posttest scores was found ($t(98) = -12.80$; $p < 0.001$).

> How large is the effect of MMJ-based learning on improving elementary students' learning outcomes across subjects?

The effect size, calculated using Cohen's d, was 0.87, categorised as large (Cohen, 2013). This indicates that MMJ not only achieved statistical significance but also carried strong practical significance in the elementary school learning context.

The effect size of 0.87 suggests that MMJ-based learning had a strong practical impact on improving students' learning outcomes. The analysis of the pretest-posttest score difference (Table 4) also revealed that the experimental group improved by 22.26 points, nearly three times the improvement of the control group, which increased by only 8.42 points.

The experimental group's improvement of 22.26 points, almost triple that of the control group, was consistent across all measured subjects.

> How does the distribution of students' achievement categories and grouping strategies influence the effectiveness of MMJ implementation?

The distribution of students' scores at each assessment stage (Table 5) shows that, prior to the intervention, the majority of

students fell within the Middle Range Marks (MRM) and Low Range Marks (LRM) categories. After MMJ implementation, the proportion of experimental group students achieving High Range Marks (HRM ≥ 70) increased dramatically to 84% in the posttest, while the proportion in LRM dropped to just 2%.

Table 1
Mean pretest and posttest scores of controls and experimental groups

Test Stage (Type)	Mean Control	Mean Experimental	Mean Difference
Pretest (Diagnostic)	57.13	55.57	1.56
Posttest (Summative)	65.55	77.83	12.28

Table 2
Independent samples t-test results

Test Stage	t(98)	p-value	Remarks
Pretest	1.90	0.060	Not significant
Posttest	-12.80	< 0.001	Significant (experimental group higher)

Table 3
Effect size

Statistic	Value	Category (Cohen, 2013)
Cohen's d	0.87	Large

Table 4
Pretest–posttest score differences

Group	Pretest Score	Posttest Score	Difference
Control	57.13	65.55	8.42
Experimental	55.57	77.83	22.26

Table 5
Distribution of student score categories at each test stage

Test Type	Group	HRM (≥70)	MRM (50–69)	LRM (<50)
Pretest	Control	14%	46%	40%
	Experimental	12%	44%	44%
Formative 1	Control	20%	50%	30%
	Experimental	38%	46%	16%
Formative 2	Control	26%	52%	22%
	Experimental	56%	38%	6%
Posttest	Control	42%	48%	10%
	Experimental	84%	14%	2%

Table 6
Grouping strategies and collaboration preferences

Student Grouping Criteria	Frequency	Percentage
Based on academic interest	3	6%
Based on intellectual ability	9	18%
Based on seating position	36	72%
Other strategies	2	4%
Preferred Group Size	Frequency	Percentage
Pairs (2 students)	4	8%
Medium group (4–6 students)	44	88%
Large group (6–8 students)	2	4%
Teacher Approach to Group Formation	Frequency	Percentage
Teacher randomly selects	41	82%
Teacher and students decide together	9	18%
Students choose themselves	0	0%

From a grouping strategy perspective, data in Table 6 indicate that most students (72%) were grouped by seating position, with a strong preference for medium-sized groups of 4-6 members (88%). The majority of teachers (82%) formed groups randomly to maintain balanced ability levels and avoid bias. Such balanced grouping strategies contributed to effective learning interactions and supported the success of MMJ implementation.

Qualitative Data Analysis Process: Tiered Coding

Qualitative data were analysed alongside data collection using Constructivist Grounded Theory methods (Charmaz, 2014), in three stages of tiered coding: initial coding, focused coding, and theoretical coding. This effort aimed to extract and construct the theoretical categories which illustrate how students' cognitive flexibility is constructed in MMJ-based learning.

During the first cycle of coding, the qualitative data from student interviews, reflection journals, classroom observations, and learning artifacts were reviewed line by line to code emergent patterns in how students initially engaged with and transformed their mathematical thinking. Special attention was paid to restructuring, contextual use of strategies, peer influence, emotional reactions, and meta-awareness in tasks on tables, graphs, estimates, and comparisons.

One student, in a reflection journal after having done an activity based around population data on insects within the school yard, wrote:

> At first, I only made a table. But then I saw my friend do a bar graph, so I tried it. It was more aesthetically pleasing and made it easier to compare.

This excerpt was given the initial codes "uncertain first attempt," "based on peer's

model," and "new strategy for clarity." These codes demonstrate a mathematical reformulation (induced by peer modelling) and an adaptive change of strategy to improve data communication.

Another student said during a group discussion session:

> I had an idea, but it didn't come out so great. My friend had a better idea, so we combined those two. It turned out great!

Examples of initial codes were "flexibility in group decision-making," "combining strategies," and "willingness to change plans." The quotations illustrate the emergence of cooperative stance-taking, which implicitly requires negotiation and fusion of mathematical ideas and reveals both reasoning and flexibility.

The following learning moment was noted from observation field notes:

> Student A began by sketching a basic table to express categories of plants. After getting some feedback, she created a colored bar graph to depict which plant was most prevalent.

The initial codes were "revised after feedback," "visual clarity through colour," and "improved data interpretation." This shift demonstrates purposeful strategy adjustment, as learners used mathematical tools not only to meet task demands but also to increase accuracy and their audience's comprehension, which are key indicators of flexible thinking.

Across the three data sources, initial codes coalesced around common behaviours, including experimenting with different ways of representing data, emulating peers and making adaptations, reflecting on errors and shifting approach, and representing ideas visually (color or diagram).

These first-order codes were then collapsed into focused categories such as 'Strategic flexibility in data representation', 'Peer-influenced adaptive thinking', 'Reflective decision-making in mathematics tasks', and 'Emotional triggers for productive change'. The preliminary phase of coding thus showed that, for elementary students, mathematical flexibility developed through a process of exploring, reflecting, and learning socially. Instead of following a "cookbook" approach, students discovered various methods for structuring, displaying, and communicating mathematical information, especially in context.

This iterative coding process also highlights the role that MMJ principles play in supporting students' capacity to iterate on ideas and respond creatively to learning difficulties, both of which are foundational to cognitive flexibility. From the various first-level codes, focused coding was used to emphasise recurring and theoretically meaningful themes within the data sources. This permitted the construction of broader, cross-contextual categories.

Table 7 presents excerpts from student interviews and written reflections, which were analysed using the three coding phases:

Table 7
Tiered coding process

Transcript Segment	Initial Coding	Focused Coding	Theoretical Coding
I enjoy learning by creating my own story problems.	Confidence in learning	Free exploration	Positive Emotion as a Driver of Exploration
When I got it wrong, I tried again using my friend's way.	Reflecting on mistakes	Productive collaboration	Meaningful Learning as a Trigger for Initiation
Playing math games makes me excited to learn.	Collaborating with peers	Free exploration	Safe Learning Environment for Cognitive Exploration
I combined my ideas with a friend's during group work.	Free experimentation	Strategy adaptation	Positive Emotion as a Driver of Exploration
Sometimes I imagine a problem happening in real life.	Variety in thinking	Productive collaboration	Reflection as a Mechanism for Strategy Adaptation
Visual explanations help me think of alternative ways.	Variety in thinking	Self-reflection	Social Interaction Reinforces Flexibility
I like creating and exchanging problems with classmates.	Collaborating with peers	Contextual connection	Positive Emotion as a Driver of Exploration
I reflected on my mistake and corrected it the next time.	Connecting to real life	Contextual connection	Reflection as a Mechanism for Strategy Adaptation
I used the teacher's method but modified it slightly.	Building personal meaning	Confidence	Meaningful Learning as a Trigger for Initiation
I usually ask a friend first when confused, then try alone.	Building personal meaning	Meaningful learning	Positive Emotion as a Driver of Exploration
I feel smart when I solve problems in my own way.	Creative problem-solving	Creativity and variation	Social Interaction Reinforces Flexibility
Real-life examples from the teacher help me understand.	Knowledge transfer from discussion	Contextual connection	Social Interaction Reinforces Flexibility
I enjoy learning when topics relate to my hobbies.	Connecting to real life	Contextual connection	Social Interaction Reinforces Flexibility
I used cartoon stories and I like to write about problems.	Knowledge transfer from discussion	Creativity and variation	Reflection as a Mechanism for Strategy Adaptation

Table 7 (*continued*)

Transcript Segment	Initial Coding	Focused Coding	Theoretical Coding
If I'm confused, I compare my method to my friend's.	Reflecting on mistakes	Creativity and variation	Social Interaction Reinforces Flexibility
Fun topics make me smile while learning.	Interest through context	Intrinsic motivation	Social Interaction Reinforces Flexibility
Sometimes I can solve problems because I've seen them before.	Variety in thinking	Self-reflection	Social Interaction Reinforces Flexibility
Outdoor learning helps me think more freely.	Connecting to real life	Strategy adaptation	Reflection as a Mechanism for Strategy Adaptation
I feel more confident sharing my ideas in group work.	Exploring new strategies	Creativity and variation	Meaningful Learning as a Trigger for Initiation
When allowed to choose methods, I feel more motivated.	Reflecting on mistakes	Self-reflection	Positive Emotion as a Driver of Exploration
I feel valued when the teacher asks for my opinion.	Confidence in learning	Meaningful learning	Safe Learning Environment for Cognitive Exploration
I realise sometimes my way is more effective.	Collaborating with peers	Self-reflection	Reflection as a Mechanism for Strategy Adaptation
I'm starting to like math because of story-based tasks.	Positive emotional engagement	Strategy adaptation	Meaningful Learning as a Trigger for Initiation
I used to fear mistakes, but now I enjoy exploring new ways.	Creative problem-solving	Contextual connection	Meaningful Learning as a Trigger for Initiation
I like exploring before deciding on a solution.	Increased motivation	Meaningful learning	Social Interaction Reinforces Flexibility
After discussions, I can think of more than one solution.	Confidence in learning	Creativity and variation	Positive Emotion as a Driver of Exploration
Sometimes I learn from my friend's mistakes.	Increased motivation	Confidence	Social Interaction Reinforces Flexibility
I prefer open-ended problems.	Interest through context	Contextual connection	Social Interaction Reinforces Flexibility
With more freedom, I become more creative.	Exploring new strategies	Self-reflection	Social Interaction Reinforces Flexibility

Table 7 (*continued*)

Transcript Segment	Initial Coding	Focused Coding	Theoretical Coding
Real-world examples make learning come alive.	Increased motivation	Meaningful learning	Meaningful Learning as a Trigger for Initiation
I enjoy expressing myself through math stories.	Connecting to real life	Creativity and variation	Safe Learning Environment for Cognitive Exploration
Learning with songs helps me remember better.	Free experimentation	Free exploration	Meaningful Learning as a Trigger for Initiation
I'm proud when my idea is used by the group.	Exploring new strategies	Intrinsic motivation	Safe Learning Environment for Cognitive Exploration
Hands-on activities help me understand more.	Exploring new strategies	Self-reflection	Social Interaction Reinforces Flexibility
I plan my steps before solving a problem.	Reflecting on mistakes	Strategy adaptation	Meaningful Learning as a Trigger for Initiation
Sometimes I combine two methods to find the answer.	Positive emotional engagement	Confidence	Positive Emotion as a Driver of Exploration
I feel more motivated with unique challenges.	Collaborating with peers	Productive collaboration	Social Interaction Reinforces Flexibility
I discovered new methods while doing homework.	Connecting to real life	Creativity and variation	Social Interaction Reinforces Flexibility
I realise I've grown I used to know only one way.	Connecting to real life	Contextual connection	Positive Emotion as a Driver of Exploration
I revise my answers when they don't feel right.	Variety in thinking	Meaningful learning	Positive Emotion as a Driver of Exploration
If the topic is fun, I want to keep learning.	Knowledge transfer from discussion	Meaningful learning	Social Interaction Reinforces Flexibility
I like brainstorming before starting an assignment.	Connecting to real life	Creativity and variation	Social Interaction Reinforces Flexibility

Categories and the Dynamics of Flexible Thinking

The iterative tiered coding process, including initial, focused, and theoretical coding, resulted in categories that describe how elementary students develop flexible thinking within the Meaningful, Mindful, and Joyful (MMJ) learning framework. Interview transcripts, written reflections, classroom observations, and learning artifacts were systematically coded line by line to detect fine-grained patterns in students' cognitive, affective, and social engagement with mathematical tasks.

Open-ended data submitted by students during the first round of coding revealed active mathematical reasoning, specifically in representation, comparing numbers, and finding patterns. One student wrote in a reflection journal:

> At first, I was a little lost on how to graph one. I only made a table. But then I saw my friend's graph and gave it a try. It turned out to be clearer.

This excerpt was coded as "confusion in initial strategy," "peer modelling" and "strategic shift for clarity." In a group interview, another student said:

> We were figuring out what chart to use. My idea didn't go very well, but then my friend gave me a different idea and we combined them. The final graph looked better.

This excerpt was coded as "peers influence adaptation," "idea integration," and "collaborative negotiation of mathematical representation." These instances suggest that students were becoming increasingly aware of how to tailor their mathematical approaches to communicate quantitative information more effectively, such as in the task of establishing a data representation.

In the focused coding phase, recurring patterns formed general categories that emerged from different types of learning situations. Codes such as "self-reflection," "contextual connection" and "strategy add resilience" began to represent the cognitive processes by which students experimented with divergent mathematical representations (i.e., moving from tables to bar graphs or infographics). These activities were typically prompted by meaningful content associations or by feedback during peer interactions. Emotional motivation also proved to be just as important for students' continued willingness to try new strategies, based on expressions of happiness, curiosity, or assurance.

Theoretical coding then elaborated on these conceptual categories to form a fuller account of how flexible thinking is socially and emotionally mediated. For example, themes included "Positive Emotion as a Driver of Exploration" and "Social Interaction Reinforces Flexibility" which highlight how emotional safety and peer talk help students take intellectual risks when solving problems. One student stated,

> I like graphs because I can represent numbers and pictures together, it's more fun and easier for everyone to understand,..

This statement indicated not only a successful outcome but also a growing metacognitive ability to judge how effectively mathematical thinking is communicated.

The cognitive changes were significant, but they also depended on meaningful contexts for learning. In real-environment activities (e.g., counting litter or measuring rainfall), students could recognise the purpose of mathematical tools. Statements such as "We counted the trash and made a chart so that other people can see which one there's more of," showed that students saw mathematics as more than procedural, serving communicative and social purposes in their lives. These results led us to the theoretical category of "Meaningful Learning as a Trigger for Idea Shift."

Taken together, these emergent categories show the dynamics of flexible thinking among elementary students, whose mathematical understanding is co-constructed through reflection, collaboration, and emotional engagement. Table 8 synthesises these findings, mapping how initial student expressions were developed into conceptual and theoretical categories that form the basis for a grounded understanding of flexible thinking in the MMJ learning environment.

Table 8
Summary of tiered coding

Initial Coding	Focused Coding	Theoretical Coding	Frequency
Exploring new strategies	Self-reflection	Social Interaction Reinforces Flexibility	2
Connecting to real life	Creativity and variation	Social Interaction Reinforces Flexibility	2
Variety in thinking	Self-reflection	Social Interaction Reinforces Flexibility	2
Collaborating with peers	Free exploration	Safe Learning Environment for Cognitive Exploration	1
Collaborating with peers	Productive collaboration	Social Interaction Reinforces Flexibility	1
Increased motivation	Confidence	Social Interaction Reinforces Flexibility	1
Increased motivation	Meaningful learning	Meaningful Learning as a Trigger for Initiation	1
Increased motivation	Meaningful learning	Social Interaction Reinforces Flexibility	1
Interest through context	Confidence	Social Interaction Reinforces Flexibility	1
Interest through context	Intrinsic motivation	Social Interaction Reinforces Flexibility	1
Knowledge transfer from discussion	Contextual connection	Social Interaction Reinforces Flexibility	1
Knowledge transfer from discussion	Creativity and variation	Reflection as a Mechanism for Strategy Adaptation	1

Table 8 (*continued*)

Initial Coding	Focused Coding	Theoretical Coding	Frequency
Knowledge transfer from discussion	Meaningful learning	Meaningful Learning as a Trigger for Initiation	1
Positive emotional engagement	Confidence	Positive Emotion as a Driver of Exploration	1
Positive emotional engagement	Strategy adaptation	Meaningful Learning as a Trigger for Initiation	1
Reflecting on mistakes	Creativity and variation	Social Interaction Reinforces Flexibility	1
Reflecting on mistakes	Productive collaboration	Meaningful Learning as a Trigger for Initiation	1
Reflecting on mistakes	Self-reflection	Positive Emotion as a Driver of Exploration	1
Variety in thinking	Meaningful learning	Positive Emotion as a Driver of Exploration	1
Variety in thinking	Productive collaboration	Reflection as a Mechanism for Strategy Adaptation	1
Free experimentation	Strategy adaptation	Positive Emotion as a Driver of Exploration	1
Free experimentation	Free exploration	Meaningful Learning as a Trigger for Initiation	1
Free experimentation	Strategy adaptation	Meaningful Learning as a Trigger for Initiation	1
Connecting to real life	Contextual connection	Social Interaction Reinforces Flexibility	1
Collaborating with peers	Self-reflection	Reflection as a Mechanism for Strategy Adaptation	1
Confidence in learning	Creativity and variation	Positive Emotion as a Driver of Exploration	1
Confidence in learning	Free exploration	Positive Emotion as a Driver of Exploration	1
Confidence in learning	Meaningful learning	Safe Learning Environment for Cognitive Exploration	1
Connecting to real life	Contextual connection	Positive Emotion as a Driver of Exploration	1
Connecting to real life	Contextual connection	Reflection as a Mechanism for Strategy Adaptation	1
Connecting to real life	Creativity and variation	Safe Learning Environment for Cognitive Exploration	1
Building personal meaning	Meaningful learning	Positive Emotion as a Driver of Exploration	1
Collaborating with peers	Contextual connection	Positive Emotion as a Driver of Exploration	1
Connecting to real life	Strategy adaptation	Reflection as a Mechanism for Strategy Adaptation	1

Table 8 (*continued*)

Initial Coding	Focused Coding	Theoretical Coding	Frequency
Creative problem-solving	Contextual connection	Meaningful Learning as a Trigger for Initiation	1
Creative problem-solving	Creativity and variation	Social Interaction Reinforces Flexibility	1
Exploring new strategies	Creativity and variation	Meaningful Learning as a Trigger for Initiation	1
Exploring new strategies	Intrinsic motivation	Safe Learning Environment for Cognitive Exploration	1
Building personal meaning	Confidence	Meaningful Learning as a Trigger for Initiation	1

Conceptual Model: The Cycle of Developing Flexible Thinking

The results of the coding analysis and data categorisation from interview transcripts and student reflections reveal that flexible thinking does not emerge instantly but rather develop through a series of dynamic and contextual learning experiences. Based on the dominant focused and theoretical coding patterns identified in Table 7 and Table 8, the development of flexible thinking is conceptualised as a reflective learning cycle supported by the Meaningful, Mindful, and Joyful Learning (MMJ) approach.

This cycle illustrates the close interaction between cognitive processes (thinking strategies), affective aspects (emotional engagement), and social dimensions (collaborative interaction), all of which play a significant role in facilitating students' ability to think flexibly, creatively, and adaptively.

The model consists of five interconnected phases, as shown in Figure 1.

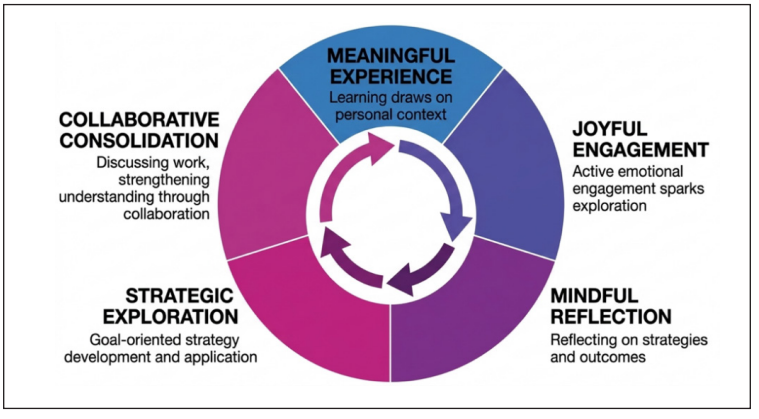

Figure 1. Conceptual model: The cycle of developing flexible thinking through MMJ learning

Meaningful Experience

This is the first level of pupil involvement with personally meaningful and 'situated' content. Meaning making begins when students experience the learning content as related to their life world. Categories such as contextual connection and building personal meaning suggest that flexible thinking is initially prompted by meaningful, activity-based learning opportunities.

Joyful Engagement

Engagement should be seen not only as a cognitive process but also as an emotional one. Students are more likely to take risks when they feel joy and interest and are unhampered by fear of failure. The categories positive emotional engagement and intrinsic motivation demonstrate the importance of affective aspects in fostering the courage to rethink.

Mindful Reflection

This stage occurs when students reflect on the strategies they employed, identify errors, and try other methods. Self-reflection and strategy adaptation are important categories illustrating this metacognitive activity. Reflection also allows students to attend to their own thinking and creates an opportunity for cognitive flexibility.

Strategic Exploration

After reflection, students are willing to try and adjust different problem-solving strategies. This is a period of active, creative exploration that welcomes uncertainty. Free experimentation, creative problem solving, and creativity and variation are categories that show how flexible thinking develops through safe exploration.

Collaborative Consolidation

In this phase, students interact with their peers, take part in group discussions, and give feedback on the strategies of others. Cooperation is how students solidify and broaden their knowledge. It is argued here that the categories of productive collaboration and social interaction reinforce flexibility, showing how flexible thinking is socially and mutually constituted in meaningful social interaction.

This model is also recursive: once students complete one cycle of learning, they may be able to enter a new cycle at a more advanced level. Accordingly, with MMJ learning as the learning context, students' flexible thinking is supported to grow continuously through an iterative approach.

DISCUSSION

The results of the present study confirm the importance of the MMJ approach for promoting cognitive flexibility while also enhancing academic performance among elementary students. Quantitatively, an independent samples t-test of the pretest scores showed no significant difference between the control and experimental groups ($t(98) = 1.90$, $p = 0.060$), indicating that the initial performance of both groups was similar. At the posttest, however, there was a significant difference ($t(98) = -12.80$,

$p < 0.001$): the experimental group had a mean score of 77.83, which was 12.28 points higher than the control group's mean of 65.55.

The learning gains of the experimental group were also apparent in the students' grade categories. Before the intervention, most students were in the middle range marks (MRM) and low range marks (LRM) categories. After MMJ was introduced, the proportion of students in the high range marks category (HRM $\geq$ 70) increased sharply to 84%, and the proportion in LRM decreased to only 2%. This difference was clear in comparison with the control group, of which only 42% reached HRM and 10% remained in LRM. The comparison of pretest-posttest gains were also favorable: the experimental group improved by 22.26 points, compared with 8.42 points for the control group, with an effect size of Cohen's $d = 0.87$ (large category; Cohen, 2013). These results suggest that MMJ was consistently and practically beneficial for improving learning achievement across all five subjects examined: Science, Mathematics, Indonesian Language, Civic Education, and Arts & Culture.

The numerical outcomes are consistent with the qualitative findings, which demonstrate how the MMJ approach embeds cognitive, affective, and social components in learning (Garzón et al., 2020). Data collected during coding also provided qualitative evidence that meaningful, contextually grounded learning drives flexible thinking among students. Content related to daily life, such as household activities, personal interests, and daily habits, motivated learners to develop a range of problem-solving strategies (Christoffels et al., 2015; Erarslan, 2023). This is in line with Froiland and Worrell (2016), who found that when tasks are contextually related, cognitive engagement increases and learners gain more personal meaning. Similar reasoning is reflected in recent work in Indonesian primary education, where a digitally mediated problem-based learning model was developed to embed local cultural values, make learning more relevant to students' lived contexts, and strengthen higher-order thinking, such as computational thinking (Mardhatillah et al., 2026). Taken together, these studies suggest that anchoring learning tasks in students' own cultural and everyday contexts is a productive condition for flexible, adaptive thinking.

Grouping arrangements also contributed to the success of MMJ. The analysis indicated that most students (72%) were grouped by seating position and that groups of 4-6 students were the most preferred size (88%). The majority of teachers (82%) assembled groups randomly, balanced by ability, to avoid favouritism. This also reflects the literature that emphasises heterogeneous grouping as a way to support the flow of ideas and improve collective thinking capability (Jalaluddin et al., 2020**;** Sakr et al., 2016; Zhao et al., 2021).

Affective engagement also had a strong impact on promoting cognitive apprenticeship. Positive emotions, energy, and psychological safety provided a

supportive milieu for second-order thinking. This is in line with the findings of De Neve et al. (2023) and Martin and Collie (2019), who found that warm teacher-student relationships increase intrinsic motivation and willingness to take intellectual risks.

Metacognitive awareness was further enhanced by the self-reflection that MMJ makes possible. Students who could examine errors, compare strategies, and evaluate the effectiveness of their actions improved their metacognitive awareness, consistent with Iskandar and Pahlevi (2021) and Rudolph et al. (2024). A nonthreatening and unhurried context, as reported by Tang and He (2022), also supported students' exploration and sharing of ideas.

These findings extend prior to work in several important ways. First, whereas earlier studies have generally examined meaningful, mindful, or joyful learning as isolated interventions (Bakosh et al., 2016; Garzón et al., 2020; Salmawati, 2023), the present results show that their combined implementation produced a considerably larger practical effect (Cohen's d = 0.87) than is typically reported for single-component interventions in elementary settings, suggesting that the three dimensions operate synergistically rather than merely additively. Second, the convergence between the quantitative gain scores and the qualitative coding categories, particularly Positive Emotion as a Driver of Exploration and Social Interaction Reinforces Flexibility, provides direct process-level evidence for why the intervention worked, not merely that it worked. This addresses a gap noted by Diamond (2013) and Gabrys et al. (2018), who called for research linking affective and social mechanisms to measurable cognitive flexibility outcomes among young learners.

Third, the achievement gains were consistent across all five subjects rather than confined to a single content area, supporting the claim that cognitive flexibility functions as a transferable skill rather than a subject-specific competency (Wang et al., 2024). This cross-subject consistency is theoretically significant because it suggests that the MMJ cycle cultivates a generalisable disposition toward flexible thinking rather than subject-bound procedural learning. At the same time, the qualitative data revealed that this flexibility was not uniformly distributed among students: those in medium-sized, teacher-balanced groups (4-6 members) reported markedly higher engagement, echoing prior findings that heterogeneous grouping amplifies opportunities for perspective exchange (Sakr et al., 2016; Zhao et al., 2021). Taken together, these results position MMJ not simply as an instructional technique but as a structural condition, one that combines content relevance, reflective practice, emotional safety, and social interaction, that jointly enables both academic achievement and the sustained development of cognitive flexibility in elementary classrooms.

In summary, the findings of this study, namely the statistical analyses of overall scores and group differences together with the qualitative findings, show that MMJ is an effective teaching approach that improves learning outcomes and supports students'

flexible thinking. The model developed in this work is a reflective, contextual learning cycle that combines instructional content, authentic context, positive emotions, conscious reflection, supportive environments, and meaningful social interaction. Integrating these components contributes to elementary education theory and also provides a practical reference for teachers designing more adaptive and holistic learning.

CONCLUSION

This study provides empirical and process-level evidence that the Meaningful, Mindful, and Joyful (MMJ) learning approach improves both academic achievement and cognitive flexibility among elementary school students. Students taught through MMJ achieved significantly higher posttest scores than those taught through traditional lecture-based instruction, with a large effect size (Cohen's d = 0.87). The qualitative findings further showed that this improvement developed through a recursive cycle of meaningful experience, joyful engagement, mindful reflection, strategic exploration, and collaborative consolidation. Taken together, these findings indicate that MMJ is an effective, replicable pedagogical approach for elementary education, and they support its continued use and further investigation in future research.

IMPLICATION OF THE STUDY

This section discusses the theoretical and practical significance of the research for elementary education. Theoretically, it contributes to the knowledge base by showing how the Meaningful, Mindful and Joyful (MMJ) learning model promotes cognitive flexibility, uniting cognition with affect and social aspects in a five-phase learning cycle. Practically, MMJ offers a replicable, interdisciplinary model that improves academic achievement and prepares students for flexible thinking. Its focus on relevance, affective engagement, and reflective practice can guide teacher education, curriculum development, and classroom practice. Policymakers could be encouraged to integrate MMJ concepts into competency-based curricula to support integrated and holistic learning and to better prepare students for complex problems.

LIMITATION AND RECOMMENDATION FOR FUTURE RESEARCH

The study used a quasi-experimental design without full randomisation, so causal inference may be constrained; the six-week intervention was implemented in a single school within one geographical region, and findings may have limited generalisability. The sample size (n = 50 per group) was determined by the number of intact classrooms available at the participating school rather than by an a priori power analysis; future studies should establish the required sample size through a priori power analysis to ensure adequate statistical power. Although the pretest difference between groups was not statistically significant (p = .060), the value approached significance; an ANCOVA controlling for

pretest scores would have provided a more robust comparison and is recommended for future replications of this design. The six-week intervention period may not have captured the long-term maintenance of the effects of the MMJ approach. Future studies should use longer-term controlled designs, larger samples, greater cultural inclusion, a wider range of socio-economic backgrounds, and digitally enhanced MMJ practices. More in-depth investigation of teacher professional development to support MMJ implementation may also improve scalability and impact.

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REFERENCES

Agbele, A. T., Oyelade, E. A., & Oluwatuyi, V. S. (2020). Assessment of students' performance in physics using two teaching techniques. *International Journal of Research and Scientific Innovation, 7*(7), 55-59. https://doi.org/10.51244/IJRSI.2020.7702

Alqudah, H., & Khasawneh, M. A. S. (2024). Assessing cognitive flexibility: Quantitative insights into the impact of adaptive learning technologies in special education. *International Journal of Data and Network Science, 8*(3), 1463-1470. https://doi.org/10.5267/j.ijdns.2024.3.019

Amirzadeh, S., Rasouli, D., & Dargahi, H. (2024). Assessment of validity and reliability of the feedback quality instrument. *BMC Research Notes, 17*, Article 227. https://doi.org/10.1186/s13104-024-06881-x

Aska, A., Rumahlatu, D., & Rehena, J. F. (2022). The influence of the PjBL-HOTS learning model on learning outcomes cognitive and metacognitive in students at SMAN 5 Central Maluku. *RUMPHIUS Pattimura Biological Journal, 4*(2), 57-61. https://doi.org/10.30598/rumphiusv4i2p057-061

Atrup, A., Diawati, P., Syamsuri, S., Pramono, S. A., & Ausat, A. M. A. (2023). The effect of entrepreneurship education and creativity on students' entrepreneurial intention: The perspective of effectuation and cognitive flexibility theory. *Jurnal Kependidikan, 9*(2), 555-569. https://doi.org/10.33394/jk.v9i2.7822

Ausubel, D. P. (1963). *The psychology of meaningful verbal learning*. Grune & Stratton.

Bakosh, L. S., Snow, R. M., Tobias, J. M., Houlihan, J. L., & Barbosa-Leiker, C. (2016). Maximizing mindful learning: Mindful awareness intervention improves elementary school students' quarterly grades. *Mindfulness, 7*(1), 59-67. https://doi.org/10.1007/s12671-015-0387-6

Barhoumi, C., & Rossi, P. G. (2013). The effectiveness of instruction-oriented hypertext systems compared to direct instruction in e-learning environments. *Contemporary Educational Technology, 4*(4), 281-308. https://doi.org/10.30935/cedtech/6109

Bougherra, A., Hamlaoui, A., & Lebchiri, A. (2023). Defining the standard levels of spontaneous

cognitive flexibility among master's students. *Physical Education of Students, 27*(4), 156-161. https://doi.org/10.15561/20755279.2023.0402

Campanati, F. L. da S., Ribeiro, L. M., da Silva, I. C. R., Hermann, P. R. de S., Brasil, G. da C., Carneiro, K. K. G., & Funghetto, S. S. (2022). Clinical simulation as a Nursing Fundamentals teaching method: A quasi-experimental study. *Revista Brasileira de Enfermagem, 75*(2), Article e20201155. https://doi.org/10.1590/0034-7167-2020-1155

Campbell, D. T., & Boruch, R. F. (1975). Making the case for randomized assignment to treatments by considering the alternatives: Six ways in which quasi-experimental evaluations tend to underestimate effects. In C. A. Bennett & A. A. Lumsdaine (Eds.), *Evaluation and experiment: Some critical issues in assessing social programs* (pp. 195-296). Academic Press.

Charmaz, K. (2014). *Constructing grounded theory* (2nd ed.). SAGE Publications.

Christoffels, I. K., de Haan, A. M., Steenbergen, L., van den Wildenberg, W. P. M., & Colzato, L. S. (2015). Two is better than one: Bilingual education promotes the flexible mind. *Psychological Research, 79*(3), 371-379. https://doi.org/10.1007/s00426-014-0575-3

Cohen, J. (2013). *Statistical power analysis for the behavioural sciences* (2nd ed.). Routledge. https://doi.org/10.4324/9780203771587

Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (3rd ed.). SAGE Publications.

De Neve, D., Bronstein, M. V., Leroy, A., Truyts, A., & Everaert, J. (2023). Emotion regulation in the classroom: A network approach to model relations among emotion regulation difficulties, engagement to learn, and relationships with peers and teachers. *Journal of Youth and Adolescence, 52*(2), 371-386. https://doi.org/10.1007/s10964-022-01678-2

Diamond, A. (2013). Executive functions. *Annual Review of Psychology, 64*, 135–168. https://doi.org/10.1146/annurev-psych-113011-143750

Erarslan, A. (2023). Cognitive flexibility and grit during times of crisis for Turkish EFL teachers. *Psychology in the Schools, 60*(7), 1910-1928. https://doi.org/10.1002/pits.22852

Farida, N., & Rasyid, H. (2019). The effectiveness of project-based learning approach to social development of early childhood. In *Proceedings of the 1st International Conference on Social Sciences Education (ICSSE 2018)*. Atlantis Press. https://doi.org/10.2991/icsie-18.2019.67

Froiland, J. M., & Worrell, F. C. (2016). Intrinsic motivation, learning goals, engagement, and achievement in a diverse high school. *Psychology in the Schools, 53*(3), 321-335. https://doi.org/10.1002/pits.21901

Gabrys, R. L., Tabri, N., Anisman, H., & Matheson, K. (2018). Cognitive control and flexibility in the context of stress and depressive symptoms: The Cognitive Control and Flexibility Questionnaire. *Frontiers in Psychology, 9*, Article 2219. https://doi.org/10.3389/fpsyg.2018.02219

Garzón, J., Kinshuk, Baldiris, S., Gutiérrez, J., & Pavón, J. (2020). How do pedagogical approaches affect the impact of augmented reality on education? A meta-analysis and research synthesis. *Educational Research Review, 31*, Article 100334. https://doi.org/10.1016/j.edurev.2020.100334

Genc, M. (2015). The project-based learning approach in environmental education. *International Research in Geographical and Environmental Education, 24*(2), 105-117. https://doi.org/10.1080/10382046.2014.993169

Iskandar, R. P. F., & Pahlevi, M. R. (2021). Students' emotional engagement in online collaborative writing through Google Document. *ETERNAL (English Teaching Journal), 12*(2), 58-67. https://doi.org/10.26877/eternal.v12i2.9191

Jalaluddin, M., Mardhatillah, Silaban, P. J., Sari, S. M., & Setiawan, D. (2020). The effect of emotional intelligence on the results of learning mathematics in students elementary school. *Advances in Mathematics: Scientific Journal, 9*(12), 10577-10582. https://doi.org/10.37418/amsj.9.12.43

Judd, C. M., & Kenny, D. A. (1981). Process analysis: Estimating mediation in treatment evaluations. *Evaluation Review, 5*(5), 602-619. https://doi.org/10.1177/0193841X8100500502

Kaur, A., & Rosli, R. (2021). Problem posing in mathematics education research: A systematic review. *International Journal of Academic Research in Progressive Education and Development, 10*(1), 438-456. https://doi.org/10.6007/IJARPED/v10-i1/8641

Kuluşaklı, E. (2025). Student engagement and flexibility in distance learning in higher education. *SAGE Open, 15*(1), Article 21582440251329979. https://doi.org/10.1177/21582440251329979

Lai, P., Stroud, F., Paladino, A., & Kalamir, N. (2023). Investigating learning designers' perceptions of student cognitive engagement in online learning. *ASCILITE Publications*. https://doi.org/10.14742/apubs.2023.499

Legare, C. H., Dale, M. T., Kim, S. Y., & Deák, G. O. (2018). Cultural variation in cognitive flexibility reveals diversity in the development of executive functions. *Scientific Reports, 8*(1), Article 16326. https://doi.org/10.1038/s41598-018-34756-2

Lin, W., Yin, H., Han, J., & Han, J. (2020). Teacher–student interaction and Chinese students' mathematics learning outcomes: The mediation of mathematics achievement emotions. *International Journal of Environmental Research and Public Health, 17*(13), Article 4742. https://doi.org/10.3390/ijerph17134742

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. SAGE Publications.

Liu, H. (2023). Research on the application of problem-based learning (PBL) teaching method in clinical emergency teaching. *Journal of Contemporary Educational Research, 7*(11), 184-189. https://doi.org/10.26689/jcer.v7i11.5659

Maharani, N. I., Dasna, I. W., & Utama, C. (2023). The effectiveness of inquiry-based learning instrument to enhance student's critical thinking skills. *Madrasah: Jurnal Pendidikan dan Pembelajaran Dasar, 15*(2). https://doi.org/10.18860/mad.v15i2.18682

Mărcuș, O., Martins, E. C., Sassu, R., & Visu-Petra, L. (2022). On the importance of being flexible: Early interrelations between affective flexibility, executive functions and anxiety symptoms in preschoolers. *Early Child Development and Care, 192*(6), 914-931. https://doi.org/10.1080/03004430.2020.1816995

Mardhatillah, K., Sari, Z. N., Kamarudin, N., Dony, N., Huzaimah, C., & Diana, I. N. (2026). Digitally mediated problem-based learning integrating Aneuk Jamee cultural values to enhance computational thinking and cultural identity in primary education. *Pertanika Journal of Social Sciences and Humanities, 34*(1), 415-447. https://doi.org/10.47836/pjssh.34.1.21

Martin, A. J., & Collie, R. J. (2019). Teacher–student relationships and students' engagement in high school: Does the number of negative and positive relationships with teachers matter? *Journal of Educational Psychology, 111*(5), 861-876. https://doi.org/10.1037/edu0000317

Ministry of Education and Culture of the Republic of Indonesia. (2013). Peraturan Menteri Pendidikan dan Kebudayaan Republik Indonesia Nomor 67 Tahun 2013 tentang kerangka dasar dan struktur kurikulum Sekolah Dasar/Madrasah Ibtidaiyah [Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 67 of 2013 concerning the basic framework and curriculum structure of primary schools/Madrasah Ibtidaiyah]

Nawawi, N., Trisianawati, E., & Karim, A. (2021). Biology blog: Project-based learning in pandemic periode to encourage students' creativity. *Thabiea: Journal of Natural Science Teaching, 4*(1). https://doi.org/10.21043/thabiea.v4i1.8866

Nuha, D. N., Febriana, B. W., & Merdekawati, K. (2020). Implementation of project based learning (PjBL) learning model through wall magazine towards learning achievement and collaborative skills. *International Journal of Chemistry Education Research, 4*(1), 37-41. https://doi.org/10.20885/ijcer.vol4.iss1.art6

Oishi, S., Takizawa, T., Kamata, N., Miyaji, S., Tanaka, K., & Miyaoka, H. (2018). Web-based training program using cognitive behavioral therapy to enhance cognitive flexibility and alleviate psychological distress among schoolteachers: Pilot randomized controlled trial. *JMIR Research Protocols, 7*(1), Article e8541. https://doi.org/10.2196/resprot.8541

Piscayanti, K. S. (2021). Cultivating mindful learning in EFL poetry class: A way to make creative and productive writers. *International Journal of Research in Education, 1*(1). https://doi.org/10.26877/ijre.v1i1.7947

Rahayuningsih, S., Anggriani, A. E., Mardhatillah, S. Faizah, Yuniawatika, & Kamarudin, N. (2025). The relationship between cognitive flexibility and mathematical literacy: Insights from Indonesian elementary students. *International Electronic Journal of Elementary Education, 17*(3), 367-381. https://doi.org/10.26822/iejee.2025.385

Rhodes, A. E., & Rozell, T. G. (2017). Cognitive flexibility and undergraduate physiology students: Increasing advanced knowledge acquisition within an ill-structured domain. *Advances in Physiology Education, 41*(3), 375-382. https://doi.org/10.1152/advan.00119.2016

Rivkin, A., & Gim, S. (2013). Student preferences regarding teaching methods in a drug-induced diseases and clinical toxicology course. *American Journal of Pharmaceutical Education, 77*(6), Article 123. https://doi.org/10.5688/ajpe776123

Rudolph, J., Ismail, M. F. B. M., & Popenici, S. (2024). Higher education's generative artificial intelligence paradox: The meaning of chatbot mania. *Journal of University Teaching and Learning Practice, 21*(6), 1-35. https://doi.org/10.53761/54fs5e77

Sakr, M., Jewitt, C., & Price, S. (2016). Mobile experiences of historical place: A multimodal analysis of emotional engagement. *Journal of the Learning Sciences, 25*(1), 51-92. https://doi.org/10.1080/10508406.2015.1115761

Salmawati, I. B. M., Manihuruk, F., & Meylinda, M. D. S. D. (2023). Project based learning and physical activity for cognitive ability stimulation in early childhood education: Study literature. *International Journal of Multidisciplinary Research and Analysis, 6*(12), 5566-5572. https://doi.org/10.47191/ijmra/v6-i12-17

Sandika, B., & Fitrihidajati, H. (2018). Improving creative thinking skills and scientific attitude through inquiry-based learning in basic biology lecture toward student of biology education. *JPBI (Jurnal Pendidikan Biologi Indonesia), 4*(1), 23-28. https://doi.org/10.22219/jpbi.v4i1.5326

Tang, Y., & He, W. (2022). Emotion regulation and psychological capital of Chinese university students during the COVID-19 pandemic: The serial mediation effect of learning satisfaction and learning engagement. *International Journal of Environmental Research and Public Health, 19*(20), Article 13661. https://doi.org/10.3390/ijerph192013661

Tashakkori, A., Teddlie, C., & Sines, M. C. (2012). Utilizing mixed methods in psychological research. In I. B. Weiner, J. A. Schinka, & W. F. Velicer (Eds.), *Handbook of psychology: Research methods in psychology* (2nd ed., Vol. 2,

pp. 428-450). John Wiley & Sons. https://doi.org/10.1002/9781118133880.hop202015

Teddlie, C., & Yu, F. (2007). Mixed methods sampling: A typology with examples. *Journal of Mixed Methods Research, 1*(1), 77-100. https://doi.org/10.1177/1558689806292430

Wang, W., Wang, X., Li, S., Ma, T., Poni Liu, M. N., & Sun, H. (2024). The relationship between emotional interaction and learning engagement in online collaborative learning: Moderated mediating effect. *Psychology in the Schools, 61*(4), 1549-1564. https://doi.org/10.1002/pits.23125

Zhao, T., Fu, Z., Lian, X., Ye, L., & Huang, W. (2021). Exploring emotion regulation and perceived control as antecedents of anxiety and its consequences during Covid-19 full remote learning. *Frontiers in Psychology, 12*, Article 675910. https://doi.org/10.3389/fpsyg.2021.675910

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Tajweed Learning with Web-Based Recitation Programme: Its Effectivity, Perception, and Effect for Online Learning During and After COVID-19

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ABSTRACT

The lack of conventional learning, which relies on a facilitator to provide feedback, has created a need for technology-based learning that can deliver rapid, continuous feedback. This study aims to assess the web-based recitation of the Tajweed programme's effectiveness compared to the traditional method. Besides, this research also evaluates students' perceptions using the experimental procedure. This research involved 88 first-year students enrolled in an Islamic Religious Education course at an Indonesian university; participants were selected via convenience sampling and divided into three groups. The students were taught the same topic (Tajweed, the rules for reading the Qur'an) using different techniques. One control class used the traditional method; the other two experiment classes used recitation programmes without facilitators. Students' conceptual comprehension was assessed through pre-tests and post-tests analysed using ANCOVA. At the same time, their perceptions were measured with a

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questionnaire and analysed using descriptive statistics and Pearson correlations to examine relationships between constructs. The results reveal that the control and experiment groups with facilitators show no significant improvement. In contrast, the independent experiment group encounters essential development. The experimental group demonstrates a sound understanding of the new learning method and can derive maximum benefit.

*Keywords: C*onceptual understanding, COVID-19, feedback learning, Qur'anic learning, resource theories, web-based recitation

INTRODUCTION

Fluently reading the Qur'an is an obligation for every Muslim. Qur'anic recitation is essential since it carries excellent rewards if recited during prayers (Elhadj et al., 2012). Someone has to master the recitation procedures, Tajweed science, to fluently recite the holy Qur'an (Ahsiah et al., 2013; Aqel & Zaitoun, 2015; Elhadj et al., 2012; Hanafi et al., 2019). According to a need analysis conducted before the study, undergraduate students have a relatively high Tajweed misconception prevalence. Instructors of Qur'anic recitation commonly encounter this issue. Some students provide correct answers to questions about Tajweed rules on the need analysis, yet many fail to explain the specific reasons.

This situation bears a more substantial burden on the instructor. The related religion and education consequences have conceived an enormous challenge for Qur'anic instructors to create better and more innovative Tajweed learning. Even if various studies discover that students face problems in Tajweed learning (Alhamuddin et al., 2018; Hanafi et al., 2019; Salic, 2017; Supriyadi & Julia, 2019), this issue remains barely acknowledged and managed by Qur'anic tutors by ignoring diagnosis on students' misconceptions and implement learning suitable for them.

There are two primary points of view on this issue, misconception and resource theories (Docktor & Mestre, 2014; Wood et al., 2014). Misconception theory perceives this problem as students' firm and consistent belief resulting from their long experience (Hammer, 1996; Thompson & Logue, 2006). According to this theory, misconception can be solved only by erasing the wrong understanding and replacing it with a new agreement. On the other hand, resource theory brings a different point of view. This theory perceives problems experienced by students as a form of students' failure to activate their cognitive resources in the context of the related issue (diSessa, 2018; Docktor & Mestre, 2014; Sabo et al., 2016; Wood et al., 2014). This theory is relatively more fluid and less definite than the misconception theory. This theory suggests that students only need to gain learning opportunities to build association patterns in the proper context (Docktor & Mestre, 2014; Wood et al., 2014). In our experience, the misconception theory is difficult to be implemented. At the same time, a previous

study confirms that the implementation of resource theory successfully resolves this problem (Diyana et al., 2020). Therefore, in this research, resource theory was selected as a framework to improve the learning method in aiding students to comprehend the Tajweed concept.

The instructors must consider students' thinking and provide feedback (Richards et al., 2018). The instructor has to notice students' way of thinking in identifying Tajweed rules and give feedback for every student's mistake. Our institution has implemented this principle through an alternative group learning method emphasising intensive interaction between instructors and students. This learning method has proven to develop students' Tajweed conceptual comprehension (Aziz et al., 2016; Marhumah, 2014; Noh et al., 2014), primarily with the help of technology (Hanafi et al., 2019).

Small group discussion learning (traditional) is alternative learning generally implemented by Qur'anic recitation tutors (Che Noh et al., 2013; Marhumah, 2014; Noh et al., 2014). Ideally, this method solves misconceptions and possibly develops a robust conceptual understanding. In various points of discussion activities, students' reason for selecting the answer to questions about Tajweed rules identification is examined. The instructor gives graded questions during this examination to determine students' conceptual understanding. If a misconception appears, the instructor provides a guiding question to improve students' way of thinking gradually.

Twice a year, our institution designs and implements training programmes for instructors. This traditional method requires much training at the beginning of the school year. However, this training is limited by time and resources. Additionally, not every instructor has the will to improve their learning method (Supriyadi & Julia, 2019). Instructors must be able to self-reflect, reform (Avalos, 2011; Clarke & Hollingsworth, 2002) and practice implementing various approaches they have learned (Gibbs et al., 2017). We have attempted to resolve this limiting factor, yet its success gives no assurance that the instructors have comparable excellent quality. Consequently, it raises whether instructors with sufficient knowledge and Qur'anic teaching skills can ideally implement this traditional teaching method.

The lack of instructors' skills and identical Quran recitation teaching methods promotes the assumption that learning strategies emphasising academic and individual tasks are better than traditional teaching methods (Ilie, 2019; Kasmini et al., 2024; Thomas et al., 2013). Additionally, computer-assisted learning brings the potential to embody this strategy since it provides valuable feedback (Deeley, 2018; Sihes et al., 2017). Recently, computer technology has been developed to analyse Qur'anic texts (Alqahtani & Atwell, 2016; Elhadj et al., 2013). Further, its ability to computerise the Tajweed learning process can be established, yet it requires a proper setting (Mohamed Elhadj et al., 2012). Computer-assisted learning can also aid

students in efficiently and effectively remembering due to the motivation factor (Lin et al., 2017; Mistler-Jackson & Songer, 2000) and reasonable pace (Thoms & Eryilmaz, 2014). This research focuses more on assessing computer-assisted independent learning effectiveness than the traditional learning model on freshman Tajweed learning. Regarding the motivation factor, the secondary purpose of this study is to evaluate students who use experimental knowledge and perception.

LITERATURE REVIEW

Implementation of Tajweed Learning During COVID-19 Pandemic

Qur'anic recitation learning is the supporting course for Islamic Education classes for every first-year Muslim student (Hanafi et al., 2019). This course is attended by at least half of the freshmen (around 2,000 students) from all faculties in Universitas Negeri Malang. The students are later grouped into a class of 30-60 students and have a weekly meeting for the Islamic Education theory class. Besides, this course also covers weekly Qur'anic recitation learning in a small groups of 6-8 students. Thus, the Islamic Education course is held twice a week. Qur'anic recitation instructors teach small groups of qualified undergraduate and postgraduate students.

Several years ago, the Qur'anic recitation learning was modified by grouping students based on their ability to ease those who belong to the beginning level that still faces difficulties in reciting with the proper articulation points (makhārij al-hurūf), as well as those who have just converted. Previous studies reveal that learning based on discussion and direct interaction among students and instructors improves conceptual understanding (Cahyadi, 2004; Wood et al., 2014). Thus this research strengthens this method to facilitate students in mastering the fundamental rules of Qur'anic recitation.

As mentioned before, the weakness of this discussion method is that it requires intensive training. The training is carried out by pairing up experienced and new instructors. Instructors need this training to learn ways to evaluate students' way of thinking through questions and give constructive feedback. However, the limited time and resources inhibit the new instructors from at least having a similar quality as the experienced instructors. Universitas Negeri Malang has substantially evaluated and transformed the programme into a more productive one with the implemented ideal and effective learning method.

Amidst the issue of unbalanced instructor quality, another problem emerged when there was a policy to close universities due to the rapid spread of COVID-19 while the learning process should run (Zhang et al., 2020). Universities' unsteady infrastructure for online learning has urged the usage of the Whatsapp Group (WAG) platform since it presumes to be conveniently operated with no preparation and popularity (Coleman & O'Connor, 2019).

WAG-based Quranic recitation classes were observed as part of the early implementation of online learning during the COVID-19 pandemic. An instructor evaluation consisted of the intensity of

their interaction and the quality of feedback to evaluate students' understanding. Most instructors have no intensive interaction (Kaden, 2020; Wang et al., 2020). They tend to provide the correct answers during the students' evaluations. The instructor feels that WAG presents limited space for discussions on the problems encountered by the students (Coleman & O'Connor, 2019; Kaliyadan et al., 2016). The instructors fail to notice every student's way of thinking and deliver feedback, as those are essential in online learning (Kaden, 2020). Also, students complain about the time and redundant messages (Cetinkaya, 2017). Online learning must be interactively and dynamically executed (Dhawan, 2020; Partlow & Gibbs, 2003). Thus, online learning's quality is way worse than face-to-face learning.

Further, instructors' training for online learning can not be conducted directly and maximally (Zhang et al., 2020). Besides, the students are spread in a wide geographical area, so internet connection remains the primary obstacle (Adnan & Anwar, 2020; Dhawan, 2020). This complex condition demands an immediate solution since students' successes rely on their interaction and the instructors in an online class.

The emergence of those problems forced this research to formulate a solution for unbalanced instructors' quality and comfortable learning for students based on resources theory. A computer tutorial was considered a solution since it provides a standardised learning experience and is interactive, flexible, enjoyable, and convenient for students across Indonesia with various geographical locations (Greenhalgh, 2001; Haq & Dacre, 2003). Through computer tutorials, a web-based recitation programme is possibly developed to replace the role of instructors in presenting repetition and feedback (Adiguzel et al., 2016; Wood et al., 2014). The most current study has taken this opportunity and proven it to carry satisfying results (Diyana et al., 2020). The development of computer tutorials bears a hopeful future since the Ministry of Education and universities project online learning to be permanent. Previously, computer tutorial has been excessively developed for physics students. Thus, this research aims to carry the same success in Islamic Education, primarily in Qur'anic recitation. This study is also expected to discuss the concerns of Islamic Education researchers on the occasional use of technology in Qur'anic recitation learning (Elhadj, 2010; Mohamed Elhadj et al., 2012).

METHODS

Need Assessment

A preliminary study was conducted to assess local needs during the universities shut down in the Fall semester of 2020 as the effect of COVID-19 spread. The study was conducted through a document analysis on curriculum and students' learning reports, observation on learning and evaluation through WAG, moderated discussion between students, and Qur'anic recitation tutor using Google Meeting app and conducting students' misconception diagnosis using the three-tier test. The obtained information was

used to develop a more modern and interactive Qur'anic recitation curriculum and to resolve identified weaknesses in the initial adaptation to distance learning. The identified vulnerabilities include students with prevalence misconception on three Tajweed materials, primarily on Noon Sakinah/Tanween and Mudood (the lengthening sound of one Madd letter), limited learning resources, and imbalance instructor quality. The learning was carried out using the WAG platform, starting with the instructors giving parts of verse from the Qur'anic to students and asking them to identify the Tajweed rules. After that, the students were asked to discuss in a small group with an instructor. However, some instructors demonstrated a low ability to respond to students' conceptual mistakes and had no sufficient capacity to give structured guidance that leads to the correct concept. The instructors tended to present the right answer without reviewing the error directly. One of the reasons for that is the limited rooms for discussion and guidance offered by WAG. As a result, various aspects of students' success in mastering the Tajweed concept rely on the instructors. Besides, the practical resource that aids students' analysis of the Tajweed concept is limited.

Setting

This research was conducted at Universitas Negeri Malang (UM), one of the universities with an excellent reputation in Indonesia's Quranic recitation curriculum. In half of the Fall semester of 2020, the study was carried out in eight online meetings through the WAG platform, resulting from the universities being shut down due to the increase of COVID-19 cases. The sessions were held once a week for 2-3 hours.

Research Design

A nonequivalent group design quasi-experimental was used to assess the effectivity of Qur'anic recitation learning with a web-based recitation programme on the Tajweed concept. This research compared the knowledge and perception of three groups, one control and two experimental groups.

Research Population and Participant

The sampling technique was decided based on a convenience sample. The population was selected based on the total number of students taking Islamic Education courses and coming on the research day from the 2019 freshman of Universitas Negeri Malang. Previously, we obtained permission from the Research Committee of Universitas Negeri Malang to conduct this research. Then, we sent an application to the centre for the development of religious life to be forwarded to the faculty in charge of the course. The faculty then asked the students for consent to participate in this study without coercion and voluntarily. A total of 88 students participated in the study. The classes were selected through convenience sampling. The control group (n=30) received traditional method. Experimental Group 1 (n=27) used WTRP with tutor, whereas Experimental Group 2 (n=31) used WTRP without tutor (Figure 1).

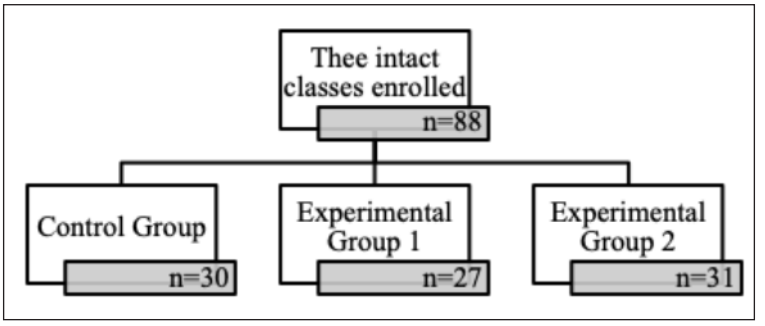

Figure 1. Participant flow and allocation across the three instructional conditions

Control Group

A class of 30 students was chosen as a control group. They attend learning with the traditional method. These students started learning by providing parts of verses of the Qur'an posted in WAG by the instructors. Later, they were asked to identify the Tajweed rules. The Tajweed rules were focused on the material package they attained for that recent meeting. There were three packages, consisting of point of articulation and Qalqalah rules (package 1), Noon Sakinah, and tanween rules (package 2), along with rules of Mudood (package 3). Each package was discussed in two meetings, while students were given pre and posttest in the first and last meetings. After the students successfully identified the rules, they were asked to discuss them in a small group with an instructor. The main task of the instructor was to build the discussion and provide feedback in the form of correct answers, along with an explanation.

Experimental Group

Two classes with 27 and 31 students were selected as the experimental group. These two classes conducted learning with a Web-based Tajweed Recitation Programme (WTRP). The first class was accompanied by a tutor, while the second class learned independently. The instructor in the first class acted as a facilitator that guided students whenever they encountered difficulties through learning using WAG. At the same time, the second class was only provided with a web link and asked to learn independently with WAG facilitated them to evaluate their way of thinking when they made a wrong answer.

Web-based Tajweed Recitation Programme (WTRP) - the web-based recitation programme consists of multiple-choice tajweed conceptual questions, followed by direct feedback for every answer. The feedback is immediately given to students to directly evaluate their way of thinking, whether or not they have activated the proper resource, which is expected to aid them in stimulating the right resource. Feedback on the perfect option is also provided to reinforce their understanding through presenting explanations and answer confirmation. Providing feedback according to what students might think is an application

Table 1
The example of question and feedback

Question	
One part of al-Madd al-Farq is al-Madd al-Ja'ez al-Munfasil. What does al-Madd al-Ja'ez al-Munfasil mean? a. The lengthening sound happens if an al-Madd al-Tabe'e letter meets Hamza in one sentence. b. The lengthening sound happens if an al-Madd al-Tabe'e letter meets a letter with Sukoon at the end of a sentence. c. If an al-Madd al-Tabe'e letter meets Hamza in another sentence, the lengthening sound happens. d. The lengthening sound that happens if an al-Madd al-Tabe'e replaces the role of Hamza.	
Feedbacks	
a.	You are incorrect! The lengthening sound that happens if an al-Madd al-Tabe'e letter meets Hamza in one sentence is called al-Madd al-Waajib al-Muttasil. Its length is 2 Alif (four diacritics) or 2 ½ Alif (five diacritics). The example of al-Madd al-Wajib al-Muttasil is presented below. فَكَانَتْ هَبَآءً مُّنۢبَثًّا
b.	You are incorrect! If an al-Madd al-Tabe'e letter meets a letter with Sukoon at the end of a sentence, the lengthening sound is named al-Madd al-'Arid lis Sukoon. Its length can be one 'Alif (two diacritics), two 'Alif (four diacritics), or three 'Alif (six diacritics). The example of al-Madd al-'Arid lis Sukoon is presented below. أُولَٰٓئِكَ الْمُقَرَّبُوْن
c.	Correct! If an al-Madd al-Tabe'e letter meets Hamza in another sentence, the lengthening sound belongs to al-Madd al-Ja'ez al-Munfasil. Its length is two Alif (four diacritics) or 2 ½ Alif (5 diacritics). The example of al-Madd al-Ja'ez al-Munfasil is presented below. وَاَصْحٰبُ الْمَشْئَمَةِ ۙ مَآ اَصْحٰبُ الْمَشْئَمَة
d.	You are incorrect! The lengthening sound that happens if an al-Madd al-Tabe'e replaces the role of Hamza is al-Madd al-Badal. Its length is 1 Alif (two diacritics). The example of al-Madd al-Badal is presented below. مَنْ يَّقُوْلُ اٰمَنَّا بِالله

of the concept of resource theory. WTRP was designed to offer an independent learning experience with no instructor help. It covers the same three packages distributed to the control class. These three packages are the material taught as part of the Universitas Negeri Malang undergraduate programme. Besides, the webpage is also equipped with navigation based on the general rules of each stage, such as learning purposes, materials menu, and the central part of the recitation programme. For instance, a question on al-Madd al-Farq rules asks the meaning of al-Madd al-Ja'ez al-Munfasil rules, accompanied by four options. Each option is followed by explaining the tajweed rules for the chosen option, ways to read, and the example of part of the verse (Table 1).

Instructors - the instructor in the experiment class acts as a facilitator. There

were four facilitators in experiment class 1. The fourth of them was asked to learn the websites before the meetings. They were also provided daily lesson plans to help them facilitate the students' discussion. The facilitator focused on giving help during the session if the students encountered difficulties, yet they were also allowed to present guiding questions. The fourth facilitators were selected based on their tremendous and comparable experience and teaching quality. Prior to the intervention, the facilitators attended an in-person training session conducted by the research team. Furthermore, Quran recitation instructors require one to two weeks of intensive training to be prepared to implement this instructional approach. Specifically, they also need a guidebook detailing teaching procedures for each material package. It should be noted that full-scale instructor training could not be conducted during the COVID-19 pandemic. Subsequently, during the teaching sessions, the level of intervention fidelity was assessed using an observation instrument. The aspects measured included adherence to the WTRP stages, intervention dosage and task duration, facilitator behavior, and student engagement. Fidelity levels were calculated descriptively using percentages, with scores of ≥80%, 60-79%, and <60% categorised as high, moderate, and low fidelity, respectively.

Outcome Measure

The primary outcome measure of this research is knowledge assessed using tests as the instrument. The test was administered before (pretest) and after (posttest) to evaluate the level of students' tajweed knowledge before and after using WTRP. The pretest score shows students' initial score; the posttest score identifies students' learning results. The test consists of 35 multiple-choice questions (four options). All pretest and posttest items cover three materials delivered to students. The test was taken from the test bank of the university to evaluate students' learning results. The test has been done through validity and reliability tests. Calculations with Pearson correlation show that all items have a p-value of less than 0.05, which means that all of them are valid. The obtained Cronbach Alpha reliability test is 0.86 is considered good.

Also, the secondary outcome measure is students' perception determined through questionnaires adapted from Ngampornchai and Adams (2016). This questionnaire uses 5 points Likert scale. Calculations with Pearson correlation show that all questionnaire items have a p-value of less than 0.05, which means that all of them are valid. The reliability of the questionnaire is high (0.93). This questionnaire was distributed after the students completed the posttest. However, the questionnaire was only given to the experiment group with no instructors (experiment group 2). Both tests and questionnaires were conducted online. Students were prohibited from opening books or notes during the test and were provided 30 minutes to finish the test.

Statistical Analysis

The data were analysed using a descriptive method and analysis of covariance (ANCOVA), with posttest score as the dependent variable, instructional group as the fixed factor, and pretest score as the covariate. Following a significant omnibus group effect, pairwise comparisons were performed using the Holm procedure. Posttest also were analysed using a paired t-test to measure the differences between the pretest and posttest for each group's primary outcome (learning results). At the same time, the descriptive statistic was used for the secondary outcome (students' perception of WTRP) of the experiment group. Pearson correlation test was performed to uncover correlations between constructs. A significance level of 0.05 was adopted for this research. We also calculated the effect size with Cohen's d formula for the significantly increasing group.

RESULTS

There are 88 students divided into three groups showed broadly similar descriptive characteristics. These groups reveal an equal level on several components: GPA (Grade Point Average) = 3.5-3.6 is considered good, the latest Quranic recitation score = 85-87 of 100 is considered good, and demographic features (freshman, approximately 30 students each class, with the composition of women and men 60:40). Both the experimental demonstrated high overall levels of implementation fidelity. Adherence to intervention procedures and dosage exceeded the established 80% criterion across both conditions. Observation of the control condition confirmed that conventional instruction was implemented as planned. Instructor-student interaction in control group was rated as low, indicating that instruction was predominantly instructor-directed with limited student-instructor exchange.

Primary Outcome Measure

Based on the pre-test results, significant differences existed among the three groups, and the ANCOVA results indicated a treatment effect on student ability ($F = 4.89$; $p = 0.010$; $\eta p^2 = 0.104$.). Regarding the adjusted post-test means, Experimental Group 2 scored the highest (M=32.28), followed by Experimental Group 1 (M=30.56) and the control group (M=28.83). Post-hoc analysis using the Holm method further revealed that Experimental Group 2 differed significantly from the control group but did not differ significantly from Experimental Group 1 (Table 2).

Table 2
Summary of ANCOVA test

Group	Pretest (M±SD)	Post-test (M±SD)	Adjusted Post-test Mean
Control (n= 30)	27.29 (7.19)	28.48 (5.83)	28.83
Experiment 1 (n= 27)	31.07 (2.43)	30.78 (3.82)	30.56
Experiment 2 (n= 31)	30.55 (4.19)	32.42 (2.14)	32.28

Table 3
Summary of paired t-test

Group	Pretest		Post-test		T	P
	Mean	SD	Mean	SD		
Control (n= 30)	27.29	7.19	28.48	5.83	0.705	0.486
Experiment 1 (n= 27)	31.07	2.43	30.78	3.82	-0.525	0.604
Experiment 2 (n= 31)	30.55	4.19	32.42	2.14	3.143	0.004

Table 4
Results of perceptions questionnaire from experimental group 2

Constructs	M	SD
Performance expectancy	4.67	0.49
Effort expectancy	4.41	0.51
Attitude	4.45	0.59
Image	3.62	0.92
Social influence & compatibility	4.27	0.75
Total	4.28	0.39

Supplementary paired t-tests showed students in experiment class 2 with independent learning using WTRP reveal significant improvement in learning results (t= 3.143, p= 0.004), with Cohen's d= 0.9 being considered high. On the other hand, students in experiment class 1 with WTRP learning guided by instructors and the control class demonstrate no significant improvement with a score of (t= -0.525, p= 0.604) and (t= 0.705, p= 0.486), respectively. The summary of all learning results is presented in Table 3.

Secondary Outcome Measure

Students in experiment class 2 show excellent perception toward WTRP, with an overall average of 4.28 (SD= 0.39). The performance expectancy construct obtains the highest perception (M= 4.67, SD= 0.49). Almost all constructs attain an average of higher than 4.0, except the image construct. The summary of all perceptions from experiment group 2 is shown in Table 4.

A correlation coefficient was calculated to test relationships between constructs. As shown in Table 5, All six constructs correlated highly with the overall acceptance of WTRP. The relationship between performance expectancy and attitude within the acceptance scale was the strongest ($r = .75$, $p < .01$). The weakest relationship was between social influence & compatibility and effort expectancy ($r = .35$, $p < .05$).

DISCUSSION AND CONCLUSION

This study investigates the effectiveness of developed WTRP to support optimum students' conceptual comprehension of the material of Tajweed. Universitas

Table 5
Pearson correlations between constructs

Constructs	Performance expectancy	Effort expectancy	Attitude	Image	Social influence & compatibility
Performance expectancy	1				
Effort expectancy	0.61**				
Attitude	0.75**	0.49**			
Image	0.60**	0.46**	0.78**		
Social influence & compatibility	0.69**	0.35*	0.67**	0.66**	
Total	0.85**	0.67**	0.90**	0.87**	0.83**

** $p < 0.01$, * $p < 0.05$

Negeri Malang conducts instructors' training at the beginning of each semester to improve instructors' applying ideal traditional Qur'anic recitation learning, where students learn in a group with an instructor. The instructors use direct learning methods (discussion) to evaluate students' understanding and guide them to activate the proper resource when they see parts of a Qur'an.

After more than five years of direct learning implementation (Hanafi et al., 2019), the most critical factor affecting students' mastery of the material was limited time and resources. Besides, some instructors had not implemented the ideal learning, even after attending the training. Further, after the universities were shut down and shifted into online learning through WAG, some instructors applied traditional learning methods differently, such as presenting parts of the Quran and explaining the correct answer with no discussion to guide students in avoiding incorrect logic. Another technique was giving worksheets as homework for students without confirming the correct answers.

This research selected a pre-post design comparing two learning environments (traditional and WTRP-assisted Qur'anic learning) and introducing a facilitator-assisted WTRP. This design was chosen to represent the type of control that supports our study.

This research shows that students' Tajweed conceptual comprehension improves pre- to post-intervention. This significant escalation only occurs in students' independent learning settings using WTRP (experiment class 2). This result exhibits that learning with WTRP, specifically designed to accelerate students' Tajweed conceptual understanding, is efficient even with a limited number of meetings with three materials packages. Our results follow previous research that shows the well-developed web-based recitation programme is beneficial for advancing students' conceptual understanding (Diyana et al., 2020).

Although the study results suggest that the absence of a facilitator yields better outcomes, this does not imply that universities should eliminate training for instructors or facilitators. Instead, the findings highlight the need to clarify the facilitator's role when implementing WTRP. Training remains essential to ensure facilitators provide appropriate guidance and support while still allowing students the opportunity to think independently. Therefore, universities considering WTRP should tailor its implementation to their specific teaching contexts and monitor implementation fidelity.

Even if this method brings promise to urge students to remain learning during the pandemic, the results of this research demonstrate that the learning results of the control group show no significant improvement. In this study, the instructors in the control class were observed to have little interaction with students. The instructors only gave a part of the Qur'anic verse and directly corrected the answers without discussion. The instructors possibly implemented this method since it provided correct answers to the questions. However, the results of this study confirm that the minimum discussion lowers students' conceptual understanding (Koenig et al., 2007).

Besides, unexpected results were discovered in this study that students who learned with instructor assisted WTRP (experiment class 1) revealed no improvement in tajweed conceptual comprehension. This was investigated by comparing two experiment groups with WTRP, with only one experiment group using instructor-assisted discussion in the answer correction process. However, the findings show that the effectiveness of the guided WTRP class is not under the expected results, where there is no improvement in understanding in this group. Furthermore, it should be noted that high fidelity scores indicate that the WTRP interventions for experimental groups 1 and 2 were generally implemented according to plan. Therefore, the absence of significant results in experimental group 1 cannot be attributed to low adherence to the intervention protocol.

This result confirms that even if the discussion is essential in the Qur'anic learning process, its combination with WTRP carries no excellent results. In contrast, this research's beneficial and meaningful effect is that independent WTRP learning is more effective than instructor assisted WTRP learning. Several reasons might explain why this happened, and it's important to note that students in experiment group 1:

1. students tend to directly get the correct answer from instructors without explanation, even if they have incorrect answers.
2. students only change their responses without discussing the correct answer between the instructor and students in a group.
3. students make no effort to activate the proper resource and adequately train their logic.

Contrarily, during the research, students in experiment group 2:

1. students study the feedback whenever they make an incorrect answer.
2. students tried to evaluate their wrong way of thinking and activate the appropriate resources. They sometimes even tried more than twice to find the correct answer. Once they found the right answer, they still studied the feedback to enhance their understanding. For example, students choose the D/A/B option to respond to answers like in the illustration table 1; then, they will relearn how they think, referring to the feedback received to find the correct answer C.

Providing feedback in WTRP causes students to question and evaluate their comprehension of tajweed and encourages them to learn more similar concepts that usually promote distortion and lead to misconception. Conceptual questions have been proven to broaden conceptual understanding (Chin, 2006; Tofade et al., 2013). At the same time, this research reinforces that idea with the existence of feedback on each answer for clarification (Oliveira & Oliveira, 2013) and sharpens students' conceptual comprehension (Fakcharoenphol et al., 2011). Therefore, the results support WTRP in Qur'anic learning during online learning. Besides, the results also emphasise that traditional education with a massive number of instructors and sophisticated training is no longer required with the implementation of WTRP, even after the COVID-19 pandemic ends.

However, even if experiment class 2 demonstrates a better performance than the two other classes, the improvement is relatively disheartening, as it is in line with the results of previous research (Adiguzel et al., 2016). The relatively low development is possibly induced by the not sufficient length of exposure for students to learn and internalise the material. Students' ability is exceptionally correlated with learning time (Lee et al., 2017). Further, the quality of feedback has to be analysed if it has not been good enough to explain the mistakes and corrections (Yu & Wu, 2013), even after being validated by experts.

In addition, experiment group 1 failure to get a better effectivity than the control group that used the traditional approach also becomes a concern. A comparison between those groups explicitly shows that the conventional approach is better in promoting students' Tajweed conceptual understanding. The learning results from the control group are possibly caused by all instructions that were carefully developed and the implementation that was probably better than the regular learning. Besides, dynamic interaction within a classroom profoundly affects learning results (Chin, 2006; Smart & Marshall, 2013). How instructors positioned themselves as facilitators when students learned using WTRP in experiment class 2 requires better coordination involving many instructors and resources. This situation brings unpredictable effects. Additionally, students' and instructors' adaptation to online learning also affects students' readiness, so the leap of learning results from all groups are not the expected results.

The secondary aim of this study is to investigate various constructs related to students' perceptions toward WTRP, from answers to questionnaires distributed to students. These questionnaire results are critical since WTRP was established to improve students' conceptual knowledge and satisfaction with online learning. Five constructs of students' perceptions were observed. In general, students show high acceptance of a web-based recitation programme. These survey results indicate that WTRP can fully integrate into universities' Qur'anic recitation curricula. Interestingly, current research also finds high acceptance of web-based recitation programmes from students (Diyana et al., 2020).

In Universitas Negeri Malang, where this study was conducted, experiments on online learning to adapt to the new normal learning were administered when the research was carried out. Therefore, high students' acceptance reveals their sufficient knowledge and experience in online education that supports the permanent implementation of this learning mode after the COVID-19 pandemic ends. The measurement of this acceptance is different from the standard e-learning measurement since this study focuses on the consequences obtained by students who used WTRP (experiment group 2).

This study found that all five constructs have a strong positive relationship and are strong indicators of technology acceptance, similar to prior research. Our analysis indicates that students who think WTRP is valuable and easy to use tend to have positive attitudes. Social influence also appeared to have a positive relationship with image and attitude.

The first three constructs (performance expectancy, effort expectancy, dan attitude) are essential to measuring students' behavioural intention (Chao, 2019). The findings confirm that students' high performance and effort expectancy underline their wise acceptance of WTRP. In other words, students think that WTRP is valuable and easy to be operated. This becomes a robust indicator that they have a positive response to this programme. These results are necessary since this WTRP is expected to be continuously used in Qur'anic recitation classes, even after online learning is no longer implemented.

As for the image construct, students feel that using WTRP is insufficient to improve someone's social status. One of the questions asked in the questionnaire was whether students learning with this recitation programme have a better understanding than those who do not use the programme. This finding is unpredictable since the learning was continuously conducted using WTRP. Besides, students' conceptual understanding was also found to increase, even if far from the expected results. Students' comfort with online technology should impact their experience of online learning success (Song et al., 2004). There is little difference between students' perceptions and learning results from this result.

Lastly, on the social effect construct, one of the questions covers the quality of

learning with WTRP. The question asked if the WTRP learning quality is the same as face-to-face learning. The results show that students tend to be satisfied with WTRP. This proves that the provided feedback replaces instructors (Wood et al., 2014). A previous study discovered that a future that checks students' understanding of the online material is sufficient to advance their learning experience and becomes more critical than face-to-face learning (Scheines et al., 2005). This result shows that carefully designed online learning brings a fun learning experience.

RECOMMENDATIONS FOR FUTURE RESEARCH

We expected that instructors assisted WTRP was learning to carries a higher comprehension than the other two classes. It was anticipated that experiment group 2 would demonstrate better results than the control class. However, interestingly, experiment group 1 presents similarly low learning results as the control class, even slightly lower. Besides, the only difference between the experimental group 1 and 2 is in the presence of instructors as facilitators yet experiment group 2 exhibits a better learning result. Further research that carefully investigates the different treatments and students' interaction in these two classes needs to be conducted to reconfirm the results of this research and previous research (Diyana et al., 2020).

However, since this research was designed to investigate WTRP as the substitute for face-to-face learning during the online learning implementation, a further investigation of its effectiveness cannot be conducted. Commonly, the recitation programme is used as a follow-up for courses and homework. Besides, follow-up tasks were not provided after students learned using WTRP. Future researchers must compare WTRP as the primary course, course follow-up, and follow-up tasks.

Also, the posttest in this research was immediately administered at the next meeting once the students finished learning all materials. Consequently, the effects of WTRP on students' retention could not be analysed (longitudinal effect of treatment). It remains a mystery if students in experiment group 2 continuously outperform other classes once the posttest is administered weeks after the course is finished. Future studies need to apply follow-up phases by issuing another posttest weeks after the first posttest.

Since learning in universities gets more exposure to online learning (Valverde-Berrocoso et al., 2020) and this learning is planned to be permanent after COVID-19 ends, instructors are recommended to have the ability to design a web-based recitation programme that emphasises the provision of constructive feedback that support students to activate the proper resources.

These findings indicate that WTRP is a potentially useful instructional resource that may be conceptually relevant to constructivism, self-directed learning, and mastery learning; however, this study did not directly measure knowledge construction, self-regulation, learner autonomy, or the process of mastering the material. Therefore,

these theories served solely as interpretive perspectives rather than as theoretical contributions directly tested in this study. Future research is needed to directly validate these theories.

Given the use of convenience sampling, intact classes, a single-institution setting, baseline nonequivalence, and limited separation of treatment effects from class-level characteristics, the results should be generalised cautiously. Future multisite studies should include larger samples, more classes within each condition, direct measures of the proposed learning mechanisms, and systematic monitoring of implementation fidelity.

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REFERENCES

Adiguzel, T., Varank, İ., Erkoç, M. F., & Buyukimdat, M. K. (2017). Examining a web-based peer feedback system in an introductory computer literacy course. *EURASIA Journal of Mathematics, Science and Technology Education, 13*(1), 237-251. https://doi.org/10.12973/eurasia.2017.00614a

Adnan, M., & Anwar, K. (2020). Online learning amid the COVID-19 pandemic: Students' perspectives. *Journal of Pedagogical Sociology and Psychology, 2*(1), 45-51. https://doi.org/10.33902/JPSP.2020261309

Ahsiah, I., Noor, N. M., & Idris, M. Y. I. (2013). Tajweed checking system to support recitation. In *2013 International Conference on Advanced Computer Science and Information Systems (ICACSIS)* (pp. 189-193). https://doi.org/10.1109/ICACSIS.2013.6761574

Alhamuddin, A., Hamdani, F. F. R. S., Tandika, D., & Adwiyah, R. (2018). Developing Al-Quran instruction model through 3A (Ajari Aku Al-Quran or Please Teach Me Al-Quran) to improve students' ability in reading Al-Quran at Bandung Islamic University. *International Journal of Education, 10*(2), 95-100. https://doi.org/10.17509/ije.v10i2.8536

Alqahtani, M., & Atwell, E. (2016). Arabic Quranic search tool based on ontology. In E. Métais, F. Meziane, M. Saraee, V. Sugumaran, & S. Vadera (Eds.), *Natural language processing and information systems* (Vol. 9612, pp. 478-485). Springer International Publishing. https://doi.org/10.1007/978-3-319-41754-7_52

Aqel, M. J., & Zaitoun, N. M. (2015). Tajweed: An expert system for Holy Qur'an recitation proficiency. *Procedia Computer Science, 65*, 807-812. https://doi.org/10.1016/j.procs.2015.09.029

Avalos, B. (2011). Teacher professional development in *Teaching and Teacher Education* over ten years. *Teaching and Teacher Education, 27*(1), 10-20. https://doi.org/10.1016/j.tate.2010.08.007

Aziz, A. A., Ibrahim, M. A., Shaker, M. H., & Nor, A. M. (2016). Teaching technique of Islamic studies in higher learning institutions for non-Arabic speakers: Experience of Faculty of Quranic and Sunnah Studies and Tamhidi Centre, Universiti Sains Islam Malaysia. *Universal Journal of Educational Research, 4*(4), 755-760. https://doi.org/10.13189/ujer.2016.040412

Cahyadi, V. (2004). The effect of interactive engagement teaching on student understanding of introductory physics at the Faculty of Engineering, University of Surabaya, Indonesia. *Higher Education Research & Development, 23*(4), 455-464. https://doi.org/10.1080/0729436042000276468

Cetinkaya, L. (2017). The impact of WhatsApp use on success in education process. *The International Review of Research in Open and Distributed Learning, 18*(7). https://doi.org/10.19173/irrodl.v18i7.3279

Che Noh, M. A., Hussein, A., Ghani, O., & Suhid, A. (2013). The study of Quranic teaching and learning: A review in Malaysia and United Kingdom. *Middle-East Journal of Scientific Research, 15*(10), Article 10.

Chin, C. (2006). Classroom interaction in science: Teacher questioning and feedback to students' responses. *International Journal of Science Education, 28*(11), 1315-1346. https://doi.org/10.1080/09500690600621100

Clarke, D., & Hollingsworth, H. (2002). Elaborating a model of teacher professional growth. *Teaching and Teacher Education, 18*(8), 947-967. https://doi.org/10.1016/S0742-051X(02)00053-7

Coleman, E., & O'Connor, E. (2019). The role of WhatsApp in medical education: A scoping review and instructional design model. *BMC Medical Education, 19*, Article 279. https://doi.org/10.1186/s12909-019-1706-8

Deeley, S. J. (2018). Using technology to facilitate effective assessment for learning and feedback in higher education. *Assessment & Evaluation in Higher Education, 43*(3), 439-448. https://doi.org/10.1080/02602938.2017.1356906

Dhawan, S. (2020). Online learning: A panacea in the time of COVID-19 crisis. *Journal of Educational Technology Systems, 49*(1), 5-22. https://doi.org/10.1177/0047239520934018

diSessa, A. A. (2018). A friendly introduction to "Knowledge in Pieces: Modeling types of knowledge and their roles in learning. In G. Kaiser, H. Forgasz, M. Graven, A. Kuzniak, E. Simmt, & B. Xu (Eds.), *Invited lectures from the 13th International Congress on Mathematical Education* (pp. 65-84). Springer International Publishing. https://doi.org/10.1007/978-3-319-72170-5_5

Diyana, T. N., Sutopo, S., & Sunaryono, S. (2020). The effectiveness of web-based recitation programme on improving students' conceptual understanding in fluid mechanics. *Jurnal Pendidikan IPA Indonesia, 9*(2), Article 2. https://doi.org/10.15294/jpii.v9i2.24043

Docktor, J. L., & Mestre, J. P. (2014). Synthesis of discipline-based education research in physics. *Physical Review Special Topics - Physics Education Research, 10*(2), Article 020119. https://doi.org/10.1103/PhysRevSTPER.10.020119

Elhadj, Y. O. M. (2010). E-Halagat: An E-Learning System for Teaching the Holy Quran. *Turkish Online Journal of Educational Technology - TOJET*, *9*(1), 54-61.

Elhadj, Y. O. M., Aoun-Allah, M., A., I., & Alansari, A. (2012). A New Scientific Formulation of Tajweed Rules for E-Learning of Quran Phonological Rules. In S. Kofuji (Ed.), *E-Learning—Engineering, On-Job Training and Interactive Teaching*. InTech. https://doi.org/10.5772/29643

Elhadj, Y. O. M., Alghamdi, M., & Alkanhal, M. (2013). Approach for Recognizing Allophonic Sounds of the Classical Arabic Based on Quran Recitations. In A.-H. Dediu, C. Martín-Vide, B. Truthe, & M. A. Vega-Rodríguez (Eds.), *Theory and Practice of Natural Computing* (pp. 57-67). Springer. https://doi.org/10.1007/978-3-642-45008-2_5

Fakcharoenphol, W., Potter, E., & Stelzer, T. (2011). What students learn when studying physics practice exam problems. *Physical Review Special Topics - Physics Education Research, 7*(1), Article 010107. https://doi.org/10.1103/PhysRevSTPER.7.010107

Gibbs, P., Cartney, P., Wilkinson, K., Parkinson, J., Cunningham, S., James-Reynolds, C., Zoubir, T., Brown, V., Barter, P., Sumner, P., MacDonald, A., Dayananda, A., & Pitt, A. (2017). Literature review on the use of action research in higher

education. *Educational Action Research, 25*(1), 3-22. https://doi.org/10.1080/09650792.2015.1124046

Greenhalgh, T. (2001). Computer assisted learning in undergraduate medical education. *BMJ, 322*(7277), 40-44. https://doi.org/10.1136/bmj.322.7277.40

Hammer, D. (1996). More than misconceptions: Multiple perspectives on student knowledge and reasoning, and an appropriate role for education research. *American Journal of Physics, 64*(10), 1316-1325. https://doi.org/10.1119/1.18376

Hanafi, Y., Murtadho, N., Ikhsan, M. A., Diyana, T. N., & Sultoni, A. (2019). Student's and instructor's perception toward the effectiveness of E-BBQ enhances Al-Qur'an reading ability. *International Journal of Instruction, 12*(3), 51-68. https://doi.org/10.29333/iji.2019.1234a

Haq, I., & Dacre, J. (2003). Computer-assisted learning in undergraduate and postgraduate rheumatology education. *Rheumatology, 42*(2), 367-370. https://doi.org/10.1093/rheumatology/keg111

Ilie, V. (2019). Traditional learning versus e-learning. In E. Soare & C. Langa (Eds.), *Education facing contemporary world issues* (Vol. 67, pp. 1192–1201). Future Academy. https://doi.org/10.15405/epsbs.2019.08.03.146

Kaden, U. (2020). COVID-19 school closure-related changes to the professional life of a K-12 teacher. *Education Sciences, 10*(6), Article 165. https://doi.org/10.3390/educsci10060165

Kaliyadan, F., Ashique, K., Jagadeesan, S., & Krishna, B. (2016). What's up dermatology? A pilot survey of the use of WhatsApp in dermatology practice and case discussion among members of WhatsApp dermatology groups. *Indian Journal of Dermatology, Venereology, and Leprology, 82*(1), 67. https://doi.org/10.4103/0378-6323.171638

Kasmini, L., Mardhatillah, & Prayudi, S. (2024). The impact of a gender mainstreaming-based blended learning flipped classroom model on the solidarity values and problem-solving abilities of students. *International Journal of Innovative Research and Scientific Studies, 7*(1), 226-239. https://doi.org/10.53894/ijirss.v7i1.2604

Koenig, K. M., Endorf, R. J., & Braun, G. A. (2007). Effectiveness of different tutorial recitation teaching methods and its implications for TA training. *Physical Review Special Topics - Physics Education Research, 3*(1), Article 010104. https://doi.org/10.1103/PhysRevSTPER.3.010104

Lee, J., Lim, C., & Kim, H. (2017). Development of an instructional design model for flipped learning in higher education. *Educational Technology Research and Development, 65*(2), 427-453. https://doi.org/10.1007/s11423-016-9502-1

Lin, M.-H., Chen, H., & Liu, K.-S. (2017). A study of the effects of digital learning on learning motivation and learning outcome. *EURASIA Journal of Mathematics, Science and Technology Education, 13*(7). https://doi.org/10.12973/eurasia.2017.00744a

Marhumah, M. (2014). Historical analysis on the geneology and the teaching of Bulugh Al-Maramin Pesantren Al-Munawwir Krapyak Yogyakarta Indonesia. *Journal of Indonesian Islam, 8*(1), 139-184. https://doi.org/10.15642/JIIS.2014.8.1.139-184

Mistler-Jackson, M., & Songer, N. B. (2000). Student motivation and Internet technology: Are students empowered to learn science? *Journal of Research in Science Teaching, 37*(5), 459-479. https://doi.org/10.1002/(SICI)1098-2736(200005)37:5%3C459::AID-TEA5%3E3.0.CO;2-C

Ngampornchai, A., & Adams, J. (2016). Students' acceptance and readiness for e-learning in Northeastern Thailand. *International Journal of*

Educational Technology in Higher Education, 13, Article 34. https://doi.org/10.1186/s41239-016-0034-x

Noh, M. A. C., Tamuri, A. H., Razak, K. A., & Suhid, A. (2014). The study of Quranic teaching and learning: United Kingdom experience. *Mediterranean Journal of Social Sciences, 5*(16), 313-317. https://doi.org/10.5901/mjss.2014.v5n16p313

Oliveira, P. C., & Oliveira, C. G. (2013). Using conceptual questions to promote motivation and learning in physics lectures. *European Journal of Engineering Education, 38*(4), 417-424. https://doi.org/10.1080/03043797.2013.780013

Partlow, K. M., & Gibbs, W. J. (2003). Indicators of constructivist principles in Internet-based courses. *Journal of Computing in Higher Education, 14*(2), 68-97.

Richards, A. J., Jones, D. C., & Etkina, E. (2018). How students combine resources to make conceptual breakthroughs. *Research in Science Education, 50*(3), 1119-1141. https://doi.org/10.1007/s11165-018-9725-8

Sabo, H. C., Goodhew, L. M., & Robertson, A. D. (2016). University student conceptual resources for understanding energy. *Physical Review Physics Education Research, 12*(1), Article 010126. https://doi.org/10.1103/PhysRevPhysEducRes.12.010126

Salic, J. Z. (2017). Difficulties of reading the Holy Qur'an as perceived by selected Muslim male faculty members in MSU-Main: Bases of intervention programme. *Journal of Social Sciences (COES&RJ-JSS), 6*(2S), 27-33. https://doi.org/10.25255/jss.2017.6.2S.27.33

Scheines, R., Leinhardt, G., Smith, J., & Cho, K. (2005). Replacing lecture with web-based course materials. *Journal of Educational Computing Research, 32*(1), 1-25. https://doi.org/10.2190/F59B-382T-E785-E4J4

Sihes, A. J., Razali, K., & Razali, K. A. (2017). The effectiveness of e-Quran in improving Tajweed learning among Standard Three pupils in primary school. *Sains Humanika, 9*(1-3). https://doi.org/10.11113/sh.v9n1-3.1143

Smart, J. B., & Marshall, J. C. (2013). Interactions between classroom discourse, teacher questioning, and student cognitive engagement in middle school science. *Journal of Science Teacher Education, 24*(2), 249-267. https://doi.org/10.1007/s10972-012-9297-9

Song, L., Singleton, E. S., Hill, J. R., & Koh, M. H. (2004). Improving online learning: Student perceptions of useful and challenging characteristics. *The Internet and Higher Education, 7*(1), 59-70. https://doi.org/10.1016/j.iheduc.2003.11.003

Supriyadi, T., & Julia, J. (2019). The problem of students in reading the Quran: A reflective-critical treatment through action research. *International Journal of Instruction, 12*(1), 311-326. https://doi.org/10.29333/iji.2019.12121a

Thomas, T., Alexander, K., Jackson, R., & Abrami, P. C. (2013). The differential effects of interactive versus didactic pedagogy using computer-assisted instruction. *Journal of Educational Computing Research, 49*(4), 403-436. https://doi.org/10.2190/EC.49.4.a

Thompson, F., & Logue, S. (2006). An exploration of common student misconceptions in science. *International Education Journal, 7*(4), 553-559.

Thoms, B., & Eryilmaz, E. (2014). How media choice affects learner interactions in distance learning classes. *Computers & Education, 75*, 112-126. https://doi.org/10.1016/j.compedu.2014.02.002

Tofade, T., Elsner, J., & Haines, S. T. (2013). Best practice strategies for effective use of questions as a teaching tool. *American Journal of Pharmaceutical Education, 77*(7), Article 155. https://doi.org/10.5688/ajpe777155

Valverde-Berrocoso, J., Garrido-Arroyo, M. del C., Burgos-Videla, C., & Morales-Cevallos, M. B. (2020). Trends in educational research about e-learning: A systematic literature review (2009-2018). *Sustainability, 12*(12), Article 5153. https://doi.org/10.3390/su12125153

Wang, G., Zhang, Y., Zhao, J., Zhang, J., & Jiang, F. (2020). Mitigate the effects of home confinement on children during the COVID-19 outbreak. *The Lancet, 395*(10228), 945-947. https://doi.org/10.1016/S0140-6736(20)30547-X

Wood, A. K., Galloway, R. K., Hardy, J., & Sinclair, C. M. (2014). Analyzing learning during peer instruction dialogues: A resource activation framework. *Physical Review Special Topics - Physics Education Research, 10*(2), Article 020107. https://doi.org/10.1103/PhysRevSTPER.10.020107

Yu, F.-Y., & Wu, C.-P. (2013). Predictive effects of online peer feedback types on performance quality. *Educational Technology & Society, 16*(1), 332-341.

Zhang, W., Wang, Y., Yang, L., & Wang, C. (2020). Suspending classes without stopping learning: China's education emergency management policy in the COVID-19 outbreak. *Journal of Risk and Financial Management, 13*(3), Article 55. https://doi.org/10.3390/jrfm13030055

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The Interaction of Figurative and Operative Thinking, and Linguistic Barriers, in Elementary School Students' Graph-Based Numeracy Literacy: A Theoretical and Empirical Misconception Analysis

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ABSTRACT

Graph-based numeracy literacy is a core competence of the 21st-century primary curriculum. Yet student failure in this domain is typically attributed either to cognitive constraints or to linguistic difficulties, seldom to their interaction. This study examines elementary school students' misconceptions in solving graph-based word problems, focusing on how the interplay between figurative and operative thinking and linguistic barriers shapes numeracy literacy. The study employed an explanatory sequential mixed-methods design. Year 5 students completed a written test, and the results guided the purposive selection of a subgroup for subsequent think-aloud and stimulated recall interviews. Findings show that students' reasoning remains dominated by figurative thinking: they compare graph components additively and in isolation rather than integrating them into a coherent quantitative structure, so their answers reflect simple addition rather than substantive mathematical reasoning. Students also show limited command

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of relational terms such as "total" and "less than half," which distorts their choice of arithmetic operations. These findings suggest that the transition from figurative to operative thinking is a principal obstacle to numeracy literacy, and that addressing it requires a dual instructional strategy that combines varied problem-solving practice with explicit attention to mathematical language.

Keywords: Figurative thinking, graph-based numeracy literacy, linguistic misconception, numeracy error analysis, operative thinking

INTRODUCTION

In the 21st century, numeracy literacy involving data interpretation and statistical representation has become a crucial competence (Harsh et al., 2019; Hejnová, 2024). A key component of this literacy is the ability to solve graph-based word problems, which depends on students' capacity to convert textual narratives into valid quantitative models. Nevertheless, a range of studies show that this type of question remains a complex problem for both students and teachers (Moore et al., 2014; Stump, 2017). In brief, a substantial gap exists between the level of abstraction in graphical data representation and real-world problem-solving ability.

The root cause of this complexity likely lies in cognitive barriers closely tied to children's developmental level. At the primary level, students generally master only partitioning strategies, in which they tend to consider data components separately and cannot yet integrate them into a single, coherent body of information. This limitation constrains children's cognitive activity and causes them to rely predominantly on simple additive thinking (Domingo, 2021; Ding et al., 2022). From a Piagetian perspective, this phenomenon involves two types of mental activity performed by students (Moore et al., 2022). Students cannot yet perform this kind of integrative reasoning because figurative thought still dominates their thinking. As a result, they find it difficult to use operative thinking to connect various data components simultaneously. This limitation in mental activity causes minimal use of operative thinking at the level of the individual student. The impact of the clash between figurative and operative modes of thinking on students' misconceptions in reading graphs ultimately becomes the most significant challenge faced by classroom teachers.

Beyond this cognitive barrier, linguistic problems also matter, yet researchers often do not examine them in depth as a cause of student failure in solving mathematical word problems. Students often develop misconceptions when interpreting mathematical terms. They understand information in a fragmented way rather than integrating the problem's full intent into a coherent understanding (Fuchs et al., 2020). Although previous research has highlighted the importance of academic language proficiency for mathematical reasoning

(Moschkovich, 2015), few studies have examined the interaction between students' core cognitive reasoning mechanisms and their linguistic comprehension, particularly in solving word problems based on graphical representations. This integrative understanding is essential for successful problem-solving because students' conclusions depend not only on what they see visually but also on what they read textually.

In light of the gap identified in the literature above, this study was designed to systematically investigate Year 5 students' misconceptions when solving graph-based numeracy problems. This approach specifically elaborates on the respective roles of figurative and operative thinking within an integrated framework linking the development of linguistic competence to students' numeracy misconceptions. This study makes a dual contribution to mathematics education research by providing empirical insight into the direct relationship between basic cognitive developmental stages and students' numeracy errors, and by formulating pedagogical directions for teaching in primary classrooms. This study therefore aims to: 1) map the profile and frequency of students' errors in solving graph-based numeracy problems using the Newman Error Analysis hierarchy, and 2) analyse in depth how the dominance of students' figurative thinking interacts with semantic-linguistic barriers in triggering these mathematical misconceptions.

LITERATURE REVIEW

Piagetian Theory: Figurative and Operative Thinking in Numeracy Literacy

Numeracy literacy involving data interpretation and reasoning about quantitative data is mediated by an individual's cognitive structures. Numeracy literacy involving data interpretation and reasoning about quantitative data is mediated by an individual's cognitive structures (Harsh et al., 2019). The Piagetian theoretical framework, which distinguishes between figurative and operative thinking (Moore et al., 2022), provides a foundation for elaborating this phenomenon. Figurative thinking, as reviewed within Piaget's genetic epistemology framework by Moore et al. (2024), is rooted in information processing dominated by direct sensory perception of an object's visual characteristics. Consequently, students at the concrete operational stage tend to rely on what they see, remember, or what is directly represented before them.

In mathematical problems, students who predominantly think figuratively make common errors, such as applying simple partitioning strategies or basic additive reasoning when the total is not the main focus, instead comparing individual components separately. In contrast, operative thinking facilitates logical coordination and flexible manipulation of abstract schemas. As Ding et al. (2022) explains in a study on the development of multiplicative reasoning, students coordinate the part-whole relationship. They explicitly demonstrated that, without flexible

mental operations (operative thinking), students become trapped in simple additive reasoning - merely adding together the visible numbers - which is a characteristic of figurative thinking. Domingo (2021), in a study on students' cognitive behaviour in mathematical problem-solving, supports this view, explaining that students' ability to manipulate information abstractly, free from the visual trap of the object, depends heavily on the maturity of their operative cognitive functions. Although the concrete operational stage is transitional, internalisation of this phase often does not proceed optimally at the individual student level. As Toluk-Uçar and Bozkuş (2018) explain, many students who are chronologically at the concrete-to-formal operational stage still rely heavily on visual and concrete representations. When faced with complex data or pattern tasks, students frequently fail to make abstract generalisations and become trapped by what is physically visible in the problem.

A purely cognitive-developmental account, however, leaves an important question unanswered: through which observable stage of the problem-solving process does this reliance on figurative thinking actually surface? Newman's Error Analysis offers an empirical way to answer this by decomposing written mathematical problem-solving into a sequence of stages, allowing researchers to pinpoint such a cognitive limitation rather than merely infer it.

Newman Error Analysis

To trace how students' cognitive and procedural limitations are reflected in their written work, one diagnostic tool is Newman's Error Analysis (NEA) (Newman, 1977). Based on this framework, the process of solving written mathematical problems is evaluated through five hierarchical stages of error, namely:

1. Reading error, which occurs when students demonstrate an inability to read sentences, numbers, units, notation, words, or mathematical symbols accurately within a word problem;
2. Comprehension error, which occurs when students fail to understand and articulate the facts, whether certain or uncertain, presented in the problem. Students may record the data given in the problem but are unable, or only partially able, to state what is known and what is being asked, because they fail to grasp the meaning of that information;
3. Transformation error, which occurs when students fail to formulate a variable model, fail to plan a solution, or make an error in determining the arithmetic operation or formula that should be used to solve the problem;
4. Process skill error, which occurs because students fail to write down or are unable to perform calculations, carry out arithmetic algorithms incorrectly, or fail to reduce the calculation to its simplest form;
5. Encoding error, which occurs when students are unable to write the final answer completely and correctly, or neglect to state the appropriate unit at the end of the solution.

Applying this NEA hierarchy helps precisely identify the stage at which students' problem-solving procedures fail (Newman, 1977), including during the process of transforming visual data representations.

Two of these five stages-comprehension and transformation - are not purely computational: both require the student first to construct an accurate semantic representation of the problem text before any cognitive operation on the data can proceed. Newman's taxonomy identifies these stages but does not, on its own, explain why comprehension or transformation fails; that explanation requires attention to the problem's linguistic dimension.

Analysis of Linguistic Misconceptions in Mathematics

Students' internal cognitive barriers are often compounded by their external linguistic limitations. As Fuchs et al. (2020) explains, the main obstacle for students in solving word problems lies not merely in their computational ability, but in understanding the problem of text itself. Students must convert verbal narratives into mathematical models. This failure occurs when students cannot integrate linguistic (semantic) information with the required mathematical structure. If students fail to do so, the mathematical problem-solving process will break down operationally.

Moschkovich (2015) further explains that developing academic mathematical language proficiency is a fundamental component in facilitating higher-level reasoning. This condition is further complicated by the characteristics of graph-based assessment instruments, which demand a range of abilities such as reading the problem text, interpreting diagrams, and processing numbers and symbols. Students' failure to integrate these domains can then trigger misconceptions in mathematical reasoning.

Read together, Fuchs et al. (2020) and Moschkovich (2015) point to the same underlying requirement from two different angles: the former shows that comprehension failure already occurs at the level of the problem text, before any calculation begins, while the latter shows that this failure is compounded once the register shifts to academic mathematical language specifically. Neither account, however, addresses how this linguistic barrier interacts with the figurative-operative distinction discussed above, which the present study addresses.

Interaction of Cognitive-Linguistic Barriers in Graph-Based Numeracy Tasks

Four adjacent bodies of work bear the present problem, yet none of them address it directly. Studies of numeracy errors more broadly (Rufiana et al., 2024; Stump, 2017) document that graph-based word problems are hard for students, without asking why in cognitive or linguistic terms. Newman's Error Analysis supplies a stage-by-stage account of where an error occurs (Newman, 1977) but as noted above, is silent on why comprehension or transformation fails at a given stage. Research on Piagetian

cognitive development (Ding et al., 2022; Domingo, 2021; Toluk-Uçar and Bozkuş, 2018) explains the figurative-operative transition itself, but treats it as a purely cognitive phenomenon, independent of the language in which a problem is posed. And work on language-related difficulties in mathematical word problems (Fuchs et al., 2020; Moschkovich, 2015) explains how comprehension can fail linguistically, independent of a student's developmental stage. Each strand, in other words, holds one variable constant while examining the other. The present study departs from all four by treating the figurative-operative transition and linguistic comprehension as jointly responsible for the same error, rather than as alternative, competing explanations. Theoretically, the dominance of figurative thinking, which limits a student's ability to coordinate numerical data, is expected to exacerbate the impact of weak linguistic understanding of key mathematical terms, and vice versa. This reciprocal relationship forms the analytical framework this study refers to as the cognitive-linguistic dual constraint, and it is through this framework that the factors hindering the development of numeracy literacy among primary school students can be more fully explained.

METHODS

Research Design

This study employed an explanatory sequential mixed-methods design (Creswell & Plano Clark, 2018) to comprehensively examine the cognitive and linguistic aspects underlying students' misconceptions in solving graph-based numeracy problems. This design consists of two sequential stages: a quantitative stage, carried out first to identify the type and frequency of student errors, followed by a qualitative stage to explain and deepen these quantitative findings. The results of the first stage formed the basis for selecting participants for the second stage, allowing researchers to trace students' reasoning processes in greater depth and identify the relationship between figurative-operative thinking and linguistic errors.

Participants

The participants in this study were Year 5 primary school students aged 10-11 years. A total of 30 students completed the written diagnostic test at the initial stage of the study. Responses were first classified according to the five Newman's Error Analysis categories, generating an individual error profile for each student across the four test items. We then used purposive sampling based on two criteria. First, pattern consistency: a student was eligible for selection only if the same error category recurred in at least three items, indicating a stable rather than incidental misconception. Second, categorical representativeness: selection was distributed to cover both dominant error categories identified in the quantitative screening—transformation and comprehension—along with at least one less frequent category so that the subsequent qualitative phase would capture the diversity of misconception types rather than only the most common

pattern. Applying these criteria to the 30 error profiles yielded four eligible students; their think-aloud and stimulated-recall data are presented in the Results section. Year 5 was selected because students at this age are at the concrete operational stage, so the transition from figurative to operative thinking was expected to be clearly reflected in the learning difficulties they experienced. This study obtained ethical approval from the relevant institution, as well as written consent from the school principal and the students' parents.

Research Instruments

This study used two main data-collection instruments, both validated through expert judgment before the research. Two validators carried out the validation: a lecturer in mathematics education and a senior mathematics teacher with more than ten years of classroom experience. Both validators reviewed each item for content relevance, wording, and grade-level appropriateness. Their feedback led to revisions focused mainly on sentence structure; several items were rewarded to match the reading level and vocabulary of Year 5 primary school students while preserving the mathematical content being tested. The first instrument was a written test consisting of graph-based word problems with narrative contexts. These items were designed to assess students' ability to interpret quantitative data, integrate information from several graph components, and apply simple additive and multiplicative reasoning. The items were specifically designed to elicit data-component separation errors that reflect students' operative thinking.

The second instrument was a semi-structured interview guide, reviewed by the same two validators, used to trace the cognitive processes underlying students' written answers. This interview employed two techniques: think-aloud, which asked students to verbalise their thinking steps as they solved the problem, and stimulated recall, which asked students to explain the reasoning behind their previously incorrect written answers.

Data Collection Procedure

Data collection was carried out over four weeks in three stages. In the first stage, the previously validated written test was administered to 30 students under standardised classroom conditions and with adequate time allocation. In the second stage, students' answers were analysed to identify the types of errors that emerged and categorised according to Newman's Error Analysis (NEA). Based on this identification, four students were purposively selected for interviews. In the third stage, I conducted individual interviews lasting 45 to 60 minutes with each student. I recorded the entire interview process using an audio recorder to capture students' thinking processes fully.

Data Analysis

Data analysis was conducted in two stages, in line with the explanatory sequential design. In the first (quantitative) stage, students' written test answers were statistically

Table 1
Frequency distribution of types of student error based on Newman's error analysis

Newman Error Stage	Frequency	Percentage (%)	Dominant Characteristic
Reading	2	6.67	Errors in reading basic graphical terms
Comprehension	9	30.00	Failure to interpret quantitative relational phrases
Transformation	13	43.33	Inability to convert data
Process Skills	4	13.33	Computational errors
Final Answer Writing	2	6.67	Mismatch between the conclusion and the context of the problem

Source: Authors' own work

classified using the Newman Error Analysis (NEA) framework into five error categories: reading, comprehension, transformation, process skills, and final answer writing. This classification showed which aspects of students' reasoning were most prone to particular error types and served as the basis for selecting participants for the interview stage. In the second (qualitative) stage, I analysed interview transcripts using semiotic and thematic analysis. A constant comparative method compared the written errors identified in the first stage with students' reasoning in the second stage. This comparison helped reveal emerging themes related to figurative-thinking dominance, limitations in additive logic, and language-comprehension barriers experienced by students. This comparison between the two stages was carried out to enhance the validity and trustworthiness of the research data.

RESULTS

Data analysis in this study was carried out in stages, beginning with a quantitative mapping of error types based on Newman's Error Analysis framework (Newman, 1977), followed by a deeper qualitative thematic analysis of the linguistic barriers underlying these errors (Fuchs et al., 2020).

Quantitative Mapping of Student Errors

Classification of the written answers of 30 students according to Newman's scheme shows that student errors were not evenly distributed but were concentrated at particular stages, as described in Table 1. This analysis determined error categories based on the first error encountered along the student's cognitive pathway according to the NEA hierarchy, so each instance of student error was classified exclusively at its earliest stage of failure.

Table 1 shows that most student errors occurred at the transformation stage (43.33%) and the comprehension stage (30%). This indicates that students' main barrier is not computational skills but coordinating visual data into a coherent mathematical model. Students' inability to integrate various quantitative data components is consistent with the characteristics of cognitive

development at the concrete operational stage, within Piaget's genetic epistemology perspective. These quantitative findings formed the basis for selecting four students for in-depth interviews to trace the four misconception patterns described below.

Thematic Analysis of Student Misconceptions

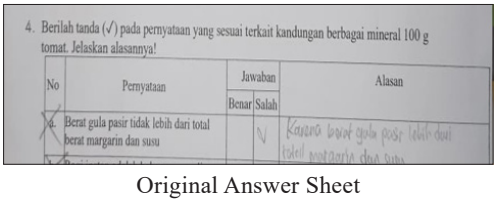
Separation or Pairwise Comparison Errors

This pattern was identified in item 4a, which tested students' ability to verify the relationship between the weight of sugar (100 grams) and the combined weight of margarine (75 grams) and milk (30 grams). Mathematically, the statement "the weight of the sugar is no more than the combined weight of the margarine and milk" is true, since 100 grams does not exceed 105 grams (75+30). S1 and S2 both marked this statement as false.

When traced through interviews, Figure 1 explained that he compared the sugar with the margarine, and then the sugar with the milk, separately, without adding the two together first. Even when asked directly whether he had tried to add the numbers together, S1 confirmed that he had only compared them one by one.

A similar pattern emerged for Figure 2, who described his solution strategy as comparing sugar with margarine, then sugar with milk, without any integration stage.

Both cases show that students process data based on partial visual perception of the components. This reflects the dominance of figurative thinking within Piaget's framework, which emphasises reliance on direct perception of concrete objects rather than abstract mental transformation.


4. Berilah tanda (√) pada pernyataan yang sesuai terkait kandungan berbagai mineral 100 g tomat. Jelaskan alasannya!

No	Pernyataan	Jawaban		Alasan
		Benar	Salah	
a.	Berat gula pasir tidak lebih dari total berat margarin dan susu		√	Karena berat gula pasir lebih dari total margarin dan susu

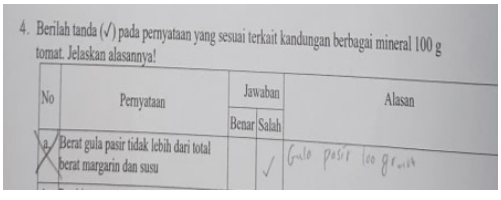
Original Answer Sheet

Mart (v) the statement that is correct regarding the mineral content of 100 grams of tomatoes. Explain your reasoning!

No	Question	Answer		Reason
		Correct	Incorrect	
1	The weight of granulated sugar is not more than the total weight of margarine and milk.		v	Because the weight of granulated sugar is more than the total weight of margarine and milk

Translation

Figure 1. S1's written answer
Source: Student answer scripts


4. Berilah tanda (√) pada pernyataan yang sesuai terkait kandungan berbagai mineral 100 g tomat. Jelaskan alasannya!

No	Pernyataan	Jawaban		Alasan
		Benar	Salah	
a.	Berat gula pasir tidak lebih dari total berat margarin dan susu		√	Gula pasir 100 gram

Original Answer Sheet

Mart (v) the statement that is correct regarding the mineral content of 100 grams of tomatoes. Explain your reasoning!

No	Question	Answer		Reason
		Correct	Incorrect	
1	The weight of granulated sugar should not exceed the total weight of margarine and milk.		v	100 grams of granulated sugar

Translation

Figure 2. S2's written answer
Source: Student answer scripts

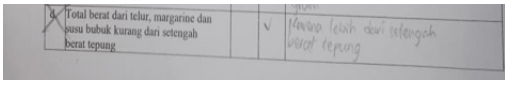
Failure to Integrate Multiple Quantities Simultaneously

This error appeared in students' work on item 4d, which tested whether the combined weight of eggs (125 grams), margarine (75 grams), and powdered milk (30 grams) was less than half the weight of flour (500 grams). Mathematically, this statement is true, since 230 grams (125+75+30) is less than 250 grams (half 500 grams).

Figure 3 shows that S3 successfully added the three components correctly (125+75+30=230) yet still marked the statement as false. When the researcher asked what was meant by "half the weight of the flour", S3 merely repeated the phrase "half the weight of the flour" without being able to state its value and fell silent when pressed further. This pattern indicates that, although S3's basic arithmetic skills were adequate, he was not yet able to coordinate the result of this addition with the second comparative concept ("half") simultaneously. This indicates a limitation in operative reasoning typical of students at the concrete operational stage.

Misconceptions Regarding Academic Mathematical Language

An evaluation of answer sheets across all subjects (S1 to S4, as documented in Figures 1 to 4) revealed a recurring pattern of misunderstanding relational terms such as "total", "no more than", and "half of". Students could not interpret these terms as part of a coherent quantitative relationship and instead used keyword-based computational strategies. This failure to form a coherent semantic representation from the verbal context supports the argument that academic language distortion is a major determinant of mathematical error, even when students' numerical computation ability is adequate.

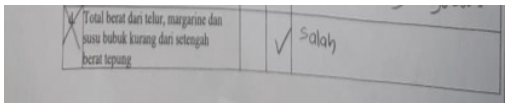


Original Answer Sheet

No	Question	Answer		Reason
		Correct	Incorrect	
1	The total weight of the eggs, margarine, and powdered milk is less than half the weight of the flour		v	because it is more than half the weight of the flour.

Translation

Figure 3. S3's written answer
Source: Student answer scripts



Original Answer Sheet

No	Question	Answer		Reason
		Correct	Incorrect	
1	The total weight of the eggs, margarine, and powdered milk is less than half the weight of the flour		v	incorrect

Translation

Figure 4. S4's written answer
Source: Student answer scripts

Confusion between Comparison, Equality, and Inequality

This pattern is clearest in subject S3. When asked what item 4d was actually asking, S3 initially understood it as a question about equality ("is the combined weight of the eggs, margarine, and powdered milk equal to half the weight of the flour") and only corrected this to "less than" after being asked to re-read the question slowly.

Although S4 (in Figure 4) correctly calculated the total weight (230 grams) and knew it was less than 250 grams, he still marked the statement as false. This occurred because he interpreted the statement as requiring equality between the two quantities rather than recognising that "less than" denotes an inequality. This finding reveals a subtle misconception than the previous themes: for S4, the issue lay not in computational ability but in understanding the statement's relational meaning.

Difficulty in Transitioning from Figurative to Operative Thinking.

A synthesis of the four clusters of findings above confirms one fundamental characteristic: students at the concrete operational stage show a strong dependence on data-separation strategies based on direct sensory-visual impressions, and have not yet achieved the mental-transformation capacity required to coordinate quantitative components simultaneously. Limited mastery of linguistic structure further accelerates this barrier to operative reasoning. Thus, the errors identified in this study result from a reciprocal interaction between cognitive-capacity constraints and linguistic-competence limitations

DISCUSSION

The Dominance of Figurative Thinking over Operative Reasoning

The findings confirm that Year 5 primary school students predominantly adopt a separation strategy when solving graph-based word problems (Moore et al., 2022; Liang & Moore, 2021). This reasoning difficulty aligns with Manmai et al. (2021), who found that among primary school students, the cognitive aspects of mathematical reasoning habits tend to remain limited to skills and procedures and are difficult to develop directly without tasks specifically designed to promote deeper reasoning. This phenomenon shows that, even though students are chronologically at the concrete operational stage, figurative reasoning still intervenes in their thought processes. As a result, students experience fundamental difficulty in constructing coherent quantitative explanations from the various data sources presented (Moore et al., 2022). This difficulty aligns with Friel et al. (2001), who argue that graph comprehension is not merely the ability to read data literally, but requires connecting various graphical elements into a single, coherent relational structure.

Although Piaget's theory of cognitive development assumes a linear and consistent transition toward operative logic, the empirical data in this study show that subjects have not yet fully constructed additive reasoning within their thinking

schemas. This barrier to conceptual data integration is consistent with the findings of Domingo (2021) and Ding et al. (2022), who identified primary school students' inability to reconstruct abstract relational structures, such as understanding the comparative significance of terms such as “greater than” or “no more than”.

The tendency to compare data components separately, without overall aggregation, indicates a strong attachment to sensory-visual representation. Figurative thinking limits students' cognitive flexibility because they conclude exclusively from the physical impressions of concrete objects directly observed by the senses, rather than through abstract mental transformation (Moore et al., 2022; Liang & Moore, 2021). This pattern aligns with the concept of “graph sense” proposed by Friel et al. (2001), whereby a holistic sensitivity to the meaning of graphs develops gradually and is not necessarily present in primary school students.

This transitional condition at the concrete operational stage leads students to fail to identify the structural relationship between the parts and the whole of the data (Domingo, 2021). Students' reasoning remains isolated at the level of partial addition operations, without being able to convert this into a substantive operative conclusion. This immaturity of a flexible and reversible operative logic system explains why the basic computational procedures students master fail to lead them to a valid mathematical solution (Ding et al., 2022).

Interaction between Cognitive Barriers and Linguistic Constraints

Barriers in mastering academic mathematical language further exacerbate the cognitive factors described above. Students' inability to conceptualise relational phrases such as “total weight” or “less than half” forces them to shift their focus onto textual characteristics. This phenomenon validates the arguments of Fuchs et al. (2020) and Prediger et al. (2018) that students' mental activity and mathematical reasoning are strictly moderated by their linguistic competence. This aligns with the meta-analytic review by Vessonen et al. (2024), which argues that cognitive load and linguistic characteristics in mathematical word problems are not independent factors but interact significantly. Problems that contain lexical inconsistencies while also requiring the integration of several solution steps are the most difficult for primary school students. Students' inability to conceptualise relational phrases such as “total weight” or “less than half” forces them to focus solely on textual characteristics rather than the relational structure embedded within them.

Students frequently fail to construct an integrative semantic and mathematical representation from the verbal context because they become trapped in keyword-based computation. When faced with complex word-problem structures, students isolate particular literal keywords (for example, extracting the word “half”) without connecting them to the overall quantitative relationship. This linguistic limitation confirms the crucial role of academic

mathematical language as a semantic bridge between the visual representation of numerical data and the conceptual aspects of the expected mathematical model (Moschkovich, 2015). Failure to understand the direction of textual instructions breaks the chain of quantitative-information coordination, demonstrating that language competence and contextual understanding are integral determinants of students' achievement of numeracy literacy.

Pedagogical Implications: A Dual Instructional Strategy

Pedagogically, the convergence of these cognitive and linguistic barriers underscores the need to implement a dual instructional strategy in primary school mathematics teaching. This urgency is reinforced by the findings of Moosapoor (2023), who reported that novice primary school teachers still have limited ability to specifically recognise the types of mathematical misconceptions students experience, meaning that instructional interventions designed based on actual student error patterns - such as those identified in this study - are crucial in filling this gap.

One instructional intervention could strengthen operative reasoning. Instructional design should focus on training students to transition from figurative to operative thinking through modelling tasks that require integrating multiple quantitative parameters, rather than drill-based exercises. Another intervention involves developing linguistic competence. This can be achieved by restructuring problem-based exercises to connect direct verbal expressions with arithmetic operations. Modification activities such as paraphrasing tasks for word-problem texts, visual modelling, and explicit instruction on academic relational terminology can reduce students' visual dependence on figurative thinking.

The synergy between strengthening additive logic and mathematical language literacy is a key tool that enables students to overcome procedural barriers, construct coherent problem representations, and solve numeracy problems of higher cognitive complexity.

CONCLUSION

This study examines elementary school students' misconceptions in solving graph-based numeracy problems by relating the stages of Newman Error Analysis to the interaction between figurative and operative thinking, as well as students' understanding of mathematical language. Quantitative analysis shows that errors concentrate in the transformation stage (43.33%) and the comprehension stage (30.00%), indicating that students' difficulties extend beyond computational procedures to the construction and coordination of mathematical meaning. Further qualitative findings show that students often process graphical information as separate components rather than coordinating these quantities into a coherent relational structure. In some cases, students could perform the necessary arithmetic operations but could not use the calculated quantities to evaluate the relationships stated in the problem.

Qualitative evidence also suggests that linguistic understanding plays a significant role in these difficulties. Terms and expressions such as "total," "no more than," and "half of" are not consistently interpreted as relational mathematical statements. Some students rely solely on specific keywords or interpret comparative statements as requiring equal values, even when their calculations yield values that could actually support the correct conclusion. These patterns suggest that computational performance alone cannot fully explain errors in graph-based numeracy tasks. Rather, these findings highlight the interaction between students' limitations in coordinating quantitative information and their difficulties in constructing accurate semantic representations of the problem. Within the Piagetian framework adopted in this study, this interaction is reflected in the continued dominance of figurative processing and the incomplete development of operative coordination. Therefore, these findings position the transition from component-by-component visual processing toward coordinated operative reasoning as a critical issue in the development of graph-based numeracy literacy among elementary school students.

IMPLICATION OF THE STUDY

These findings have implications for designing numeracy instruction, particularly when students are asked to interpret graphical information in word problems. Instruction should not treat the interpretation of graphs, mathematical language, and computation as separate competencies. The errors identified in this study indicate that students may possess sufficient procedural knowledge to perform arithmetic operations but fail to establish the quantitative relationships required by the problems. Consequently, instructional activities should give students opportunities to integrate multiple pieces of information before selecting an operation or forming a conclusion. Tasks that require students to compare quantities, combine multiple data components, and explain the relationship between parts and the whole can provide a more appropriate context for developing operational thinking than exercises that focus primarily on obtaining numerical answers.

These findings also have implications for the teaching of mathematical language in elementary school classrooms. Expressions such as "total," "no more than," and "half of" should be understood as mathematical relationships, not merely as isolated vocabulary terms associated with specific operations. Teachers can ask students to restate on a problem in their own words, represent these relationships with numbers or visual models, and explain why a particular comparison is valid. These activities can help build semantic connections between a problem's wording and its underlying quantitative structure. This is particularly relevant for graph-based tasks, where students must integrate information presented through both textual and visual representations.

Regarding assessment and learning diagnosis, study results indicate that

simply determining whether an answer is correct or incorrect does not provide sufficient information about the source of a student's difficulties. The use of Newman's Error Analysis can help distinguish between difficulties in understanding and transformation from errors that occur during calculation or the formulation of the final answer. Combining this diagnostic information with students' explanations of their reasoning can provide a more accurate basis for teachers to determine whether the errors stem from a misunderstanding of mathematical language, a failure to coordinate graphical information, or difficulty in carrying out the necessary procedures. This diagnostic differentiation can guide further learning support, rather than treating all incorrect answers the same.

LIMITATIONS AND RECOMMENDATION FOR FUTURE RESEARCH

This study has several methodological limitations that should be considered when interpreting its results. First, the research scope was limited to an in-depth qualitative analysis of four representative subjects (S1 to S4) at Year 5 primary school level. Although this approach provides an in-depth understanding of the cognitive and linguistic mechanisms underlying student errors, the limited sample size does not support broad statistical generalisation regarding the prevalence of figurative reasoning across the wider population of students at the concrete operational stage. Second, the assessment instrument focused on graph-based word problems in the specific context of ingredient quantities and therefore did not examine students' numeracy literacy performance on other types of visual data presentation with different levels of complexity, such as pie charts or multi-trend line graphs. Finally, the linguistic analysis identified only manifestations of misconceptions regarding certain academic mathematical terminology. Still, it did not measure the contribution of students' general reading comprehension ability to mathematical reasoning distortion in isolation.

Given these limitations, several directions may be pursued for future research. First, follow-up studies could employ a mixed-methods design involving a larger random sample to provide a more comprehensive picture of the distribution of partitioning strategies and the development of additive reasoning among elementary school students. Second, experimental studies or classroom action research are needed to empirically test the effectiveness of the proposed dual instructional strategy—which combines mathematical modelling with academic language reinforcement—particularly in reducing students' reliance on figurative reasoning. Third, future research should include standardised reading literacy assessments to distinguish general linguistic barriers from difficulties specifically related to the semantic processing of academic mathematical language. Finally, comparative studies involving various forms of graphical representations—including single-bar diagrams, pie charts, and complex infographics—could examine how

variations in visual formats affect students' ability to transform visual information into valid operational mathematical models.

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REFERENCES

Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research (3rd ed.)*. SAGE Publications.

Ding, R., Tzur, R., Davis, A., Wei, B., Jin, X., & Jin, X. (2022). Distinguishing conceptions of multiplicative reasoning in Chinese elementary students: What sense correct and incorrect solutions might make to them? *Asian Journal for Mathematics Education*, 1(2), 242-262. https://doi.org/10.1177/27527263221110629

Domingo, J. G., Ibañez, E. D., Subia, G. S., Pentang, J. T., Gamit, A. M., Pascual, L. E., Mina, J. C., Tomas, A. V., & Liangco, M. M. (2021). Cognitive skills achievement in mathematics of the elementary pre-service teachers using Piaget's seven logical operations. *Turkish Journal of Computer and Mathematics Education*, 12(4), 435-440. https://doi.org/10.17762/turcomat.v12i4.524

Friel, S. N., Curcio, F. R., & Bright, G. W. (2001). Making sense of graphs: Critical factors influencing comprehension and instructional implications. *Journal for Research in Mathematics Education*, 32(2), 124-158. https://doi.org/10.2307/749671

Fuchs, L. S., Fuchs, D., Seethaler, P. M., & Craddock, C. (2020). Improving language comprehension to enhance word-problem solving. *Reading & Writing Quarterly*, 36(2), 142-156. https://doi.org/10.1080/10573569.2019.1666760

Harsh, J. A., Campillo, M., Murray, C., Myers, C., Nguyen, J., & Maltese, A. V. (2019). "Seeing" data like an expert: An eye-tracking study using graphical data representations. *CBE—Life Sciences Education, 18*(3), Article ar32. https://doi.org/10.1187/cbe.18-06-0102

Hejnová, E. (2024). Evaluating secondary school students' science literacy with the Test of Scientific Literacy Skills (TOSLS). Journal of Physics: Conference Series, 2715(1), Article 012005. https://doi.org/10.1088/1742-6596/2715/1/012005

Liang, B., & Moore, K. C. (2021). Figurative and operative partitioning activity: Students' meanings for amounts of change in covarying quantities. *Mathematical Thinking and Learning,* 23(4), 291-317. https://doi.org/10.1080/10986065.2020.1789930

Manmai, T., Inprasitha, M., & Changsri, N. (2021). Cognitive aspects of students' mathematical reasoning habits: A study on utilizing lesson study and open approach. *Pertanika Journal of Social Sciences and Humanities*, 29(4), 2591-2614. https://doi.org/10.47836/pjssh.29.4.27

Moore, K. C., Silverman, J., Paoletti, T., & LaForest, K. R. (2014). Breaking conventions to support quantitative reasoning. *Mathematics Teacher Educator*, 2(2), 141-157. https://doi.org/10.5951/mathteaceduc.2.2.0141

Moore, K. C., Liang, B., Stevens, I. E., Tasova, H. I., & Paoletti, T. (2022). Abstracted quantitative structures: Using quantitative reasoning to define concept construction. In G. Karagöz Akar, İ. Ö. Zembat, S. Arslan, & P. W. Thompson (Eds.), Quantitative Reasoning in Mathematics and Science Education (pp. 35-69). Springer International Publishing. https://doi.org/10.1007/978-3-031-14553-7_3

Moore, K. C., Stevens, I. E., Tasova, H., & Liang, B. (2024). Operationalizing figurative and operative framings of thought. In P. C. Dawkins, A. J. Hackenberg, & A. Norton (Eds.), Piaget's Genetic Epistemology for Mathematics Education Research (pp. 89-128). Springer. https://doi.org/10.1007/978-3-031-47386-9_4

Moosapoor, M. (2023). New teachers' awareness of mathematical misconceptions in elementary students and their solution provision capabilities. *Education Research International*, 2023, Article 4475027. https://doi.org/10.1155/2023/4475027

Moschkovich, J. N. (2015). Academic literacy in mathematics for English learners. *The Journal of Mathematical Behavior*, 40, 43-62. https://doi.org/10.1016/j.jmathb.2015.01.005

Newman, M. A. (1977). An analysis of sixth-grade pupils' errors on written mathematical tasks. *Victorian Institute for Educational Research Bulletin, 39*, 31-43.

Prediger, S., Wilhelm, N., Büchter, A., Gürsoy, E., & Benholz, C. (2018). Language proficiency and mathematics achievement: Empirical study of language-induced obstacles in a high-stakes test, the central exam ZP10. *Journal für Mathematik-Didaktik, 39*(Suppl. 1), 1-26. https://doi.org/10.1007/s13138-018-0126-3

Rufiana, I. S., Arifin, S., Randy, M. Y., & Amaliya, F. N. (2024). Analysis of student errors in solving numeracy literacy problems of graph representation model in elementary school. *Al Ibtida: Jurnal Pendidikan Guru MI*, 11(2), 300-319. https://doi.org/10.24235/al.ibtida.snj.v11i2.18720

Stump, S. (2017). Quantitative reasoning for teachers: Explorations in foundational ideas and pedagogy. *Numeracy*, 10(2), Article 9. https://doi.org/10.5038/1936-4660.10.2.9

Toluk-Uçar, Z., & Bozkuş, F. (2018). Elementary school students' and prospective teachers' proportional reasoning skills. *International Journal for Mathematics Teaching and Learning*, 19(2), 205-222. https://doi.org/10.4256/ijmtl.v19i2.78

Vessonen, T., Dahlberg, M., Hellstrand, H., Widlund, A., Korhonen, J., Aunio, P., & Laine, A. (2024). Task characteristics associated with mathematical word problem-solving performance among elementary school-aged children: A systematic review and meta-analysis. *Educational Psychology Review, 36*(4), Article 117. https://doi.org/10.1007/s10648-024-09954-2

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Followers' Perspectives: Motivations and Implications of Parasocial Relationships with Sustainability Micro-influencers on Instagram

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ABSTRACT

Sustainability influencers have emerged as important communicators in promoting environmentally responsible lifestyles through social media. However, limited attention has been given to understanding why audiences develop parasocial relationships with sustainability influencers and how these relationships are experienced from followers' perspectives. This study explores followers' motivations for developing parasocial relationships with Indonesian sustainability micro-influencers on Instagram and examines the implications of these relationships in the sustainability context. Employing a qualitative descriptive approach, this study conducted semi-structured interviews with 15 followers of three sustainability micro-influencers and analysed the data using thematic analysis. The findings reveal three main motivations underlying parasocial relationship development: value congruence, accessible communication, and relatable and practical sustainability practices. Furthermore, parasocial relationships are associated with several implications, including supportive and defensive engagement, reinforcement of sustainability values and practices, positive emotional and attitudinal changes, sustainability-related behavioural adjustments, and a sense of companionship and belonging. The study contributes to parasocial relationship literature by highlighting that, in the sustainability context, parasocial relationships involve not only influencer attributes but also shared values and everyday sustainability practices. Practically, the findings suggest that sustainability micro-influencers can foster meaningful audience engagement by communicating sustainability messages in accessible, relatable, and non-judgmental ways while creating a sense of shared community.

Keywords: Follower, Instagram, micro-influencer, parasocial relationship, sustainability

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INTRODUCTION

Environmental degradation has become an increasingly urgent global concern, driven by climate change, biodiversity loss, pollution, and unsustainable patterns of resource consumption. Human activities have significantly changed natural ecosystems worldwide, threatening environmental sustainability and human well-being (United Nations Environment Programme, 2025). Similar challenges are evident in Indonesia, where deforestation, environmental pollution, and waste management problems continue to pose serious environmental concerns (Pristiandaru, 2024; Walhi, 2021; Zubaidi, 2025). These issues underscore the need for transformative actions that encourage more sustainable ways of living and consumption (United Nations Environment Programme, 2024).

Promoting sustainable lifestyles has become an important strategy for addressing environmental challenges. Sustainable lifestyles emphasise environmentally responsible behaviours in everyday life, including sustainable consumption practices, waste reduction, and recycling (Graham-Rowe et al., 2019; Lubowiecki-Vikuk et al., 2021). Such behaviour was found to be a successful way to promote sustainable development and lessen the harmful impacts of consumption on ecosystems and the environment (Lin & Chen, 2022). Encouraging such behavioural changes requires not only policy interventions but also effective communication that can make sustainability more accessible and meaningful to the public. The growing use of digital platforms has created new opportunities to communicate sustainability values and engage individuals in adopting more sustainable ways of living.

As sustainability issues continue to gain attention, sustainability influencers have emerged as important communicators on social media. These influencers consistently create content that promotes environmental awareness, sustainable practices, and environmentally friendly behaviours (Monga & Gupta, 2024). Through their content, they encourage audiences to adopt green, low-carbon, simple, and moderate lifestyles by demonstrating practical sustainability practices, such as using environmentally friendly products and engaging in product reduction, reuse, and recycling (Liang et al., 2024).

Influencers' consistent interactions with their audiences can foster a sense of closeness that gives rise to parasocial relationships, defined as the illusory intimacy developed through repeated interactions with media figures (Horton & Wohl, 1956). Previous studies have shown that factors such as influencers' attractiveness, direct interactions with audiences, shared values, self-disclosure, expertise, and authenticity positively strengthen parasocial relationships (Chen et al., 2023; Chung & Cho, 2017; Lacap et al., 2024; Mai et al., 2023; McLaughlin & Wohn, 2021; Ong et al., 2022; Rungruangjit, 2022; Yousaf, 2022). In turn, parasocial relationships have been found to shape various audience behaviours, including trust in influencers, purchase intentions toward

recommended products, participation in fan communities, intentions to visit recommended destinations, and repeated engagement with influencer-generated content (Chung & Cho, 2017; Lacap et al., 2024; Lawrence & Meivitawanli, 2023; J. Liu, 2023; Mai et al., 2023; Yılmazdoğan et al., 2021).

In the context of sustainability influencers, parasocial relationships have also been shown to encourage positive environmental attitudes and behaviours. Previous studies suggest that trust in and the perceived influence of sustainability influencers can shape audiences' intentions and behaviours toward adopting sustainable lifestyles and practices (Breves & Liebers, 2022; Dekoninck et al., 2023; Horng et al., 2024). Parasocial relationships have also been found to foster pro-environmental identities and motivate environmentally responsible actions among audiences (Cui et al., 2024; Knupfer et al., 2023).

Despite the growing body of research on sustainability influencers, existing studies have primarily examined the behavioural outcomes of parasocial relationships, such as sustainable intentions and pro-environmental behaviours. Less is known about why audiences develop parasocial relationships with sustainability influencers and how these relationships are reflected in the ways audiences engage with sustainability values and influencer-generated content. Addressing this gap, the present study explores audiences' motivations for developing parasocial relationships with a sustainability influencer and examines the implications of parasocial relationships in the sustainability context.

The sustainability context is particularly important because sustainability influencers communicate values and everyday sustainability practices that audiences may incorporate into their daily lives. Unlike many other types of influencers that primarily promote products, experiences, or entertainment, sustainability influencers encourage environmentally responsible ways of living and invite audiences to reflect on their everyday choices. This nature suggests that parasocial relationships in the sustainability context may involve different audience motivations and forms of engagement. Understanding these relationships from the audience's perspective therefore remains an important area for research.

The present study specifically focuses on parasocial relationships with Indonesian sustainability micro-influencers on Instagram. In the Indonesian context, sustainability influencers have increasingly contributed to raising public awareness of sustainability issues and are regarded as one of the trusted sources of information on sustainable products and practices (Mirnaaf, 2024; Snapcart, 2024). Previous studies have also highlighted the role of influencers in encouraging sustainable attitudes, behaviours, and community engagement (Eldon et al., 2025; Pertiwi et al., 2025; Suryaputra et al., 2024). Indonesia also provides a particularly relevant setting for this study, given the widespread use of Instagram (Asosiasi Penyelenggara

Jasa Internet Indonesia, 2026; The Global Statistics, 2026). While previous studies have primarily focused on influencers in general, the present study examines sustainability of micro-influencers, defined as individuals with 10,000 to 100,000 followers. Micro-influencers are often perceived as more persuasive and generate higher audience engagement than larger influencers (Sokolova & Perez, 2021). Their closer and more interactive relationships with followers make them particularly relevant.

Accordingly, this study explores why audiences develop parasocial relationships with an Indonesian sustainability micro-influencer on Instagram and examines the implications of these relationships. By focusing on the audience's perspective, this study contributes to a deeper understanding of parasocial relationships in the sustainability context and highlights their role in shaping audiences' connections with sustainability values and influencer-generated content. The findings also provide practical insights for sustainability influencers and communicators in fostering meaningful engagement and communicating sustainability-related messages on social media.

LITERATURE REVIEW

Parasocial Relationships

Parasocial interaction and parasocial relationships are closely related but conceptually distinct constructs that describe audiences' responses to media figures (Forster et al., 2021). Horton and Wohl (1956) introduced parasocial interaction as a "simulacrum of conversational give and take" experienced by media users during exposure to media figures. It refers to a situational experience in which audiences perceive a mediated interaction as if they are participating in a reciprocal conversation with a media figure, although the interaction is not genuinely reciprocal. For example, audiences may feel that a television presenter is directly addressing them through eye contact, conversational style, or verbal cues (Hartmann & Goldhoorn, 2011).

In contrast, parasocial relationships refer to a more enduring social and emotional bond developed through repeated exposure to media figures beyond a specific media encounter (Forster, 2011; Hartmann et al., 2008). It involves feelings of familiarity, intimacy, and connection, where audiences perceive media figures as personally meaningful figures despite the absence of a genuine interpersonal relationship (Labrecque, 2014). Although Horton and Wohl (1956) initially used the term parasocial relationship to describe both momentary interaction and long-term attachment, later studies have emphasised the distinction between parasocial interaction as a temporary experience and parasocial relationship as a stable relational outcome (Forster et al., 2021; Hartmann et al., 2008). Therefore, this study uses the term parasocial relationships to refer to the ongoing emotional connection followers developing with sustainability influencers, rather than the momentary interaction occurring during media exposure.

The development of social media has transformed parasocial relationships by enabling greater opportunities for interaction between influencers and audiences. Unlike traditional media, platforms such as Instagram allow users to engage through likes, comments, shares, and direct messages, while influencers can respond through content creation, replies, or other forms of interaction (Grau, 2022). Nevertheless, these interactions do not necessarily eliminate the relationship's parasocial nature, as communication between influencers and followers remains largely asymmetrical. Followers may perceive closeness and interpersonal connection, but they generally do not experience an equivalent reciprocal relationship with influencers (Lee & Watkins, 2016).

Parasocial relationships are distinct from related concepts such as identification, homophily, trust, admiration, and social media engagement. Identification refers to seeing oneself as similar to or like a media figure, while homophily reflects perceived similarity between audiences and influencers (Santateresa-Bernat et al., 2023; Z. Xu et al., 2021). Trust refers to confidence in an influencer's credibility, while admiration reflects positive appreciation of the influencer (Yılmazdoğan et al., 2021). Social media engagement refers to observable actions such as liking, commenting, and sharing. In contrast, parasocial relationships involve a broader sense of closeness, familiarity, emotional attachment, and ongoing connection with media figures. Although these concepts may be related, they represent different aspects of audience responses.

Previous research has identified various antecedents that contribute to the development of parasocial relationships. These antecedents can be categorised into influencer-related factors, audience-related factors, content characteristics, and media-use characteristics. Influencer characteristics such as attractiveness, direct interaction, self-disclosure, expertise, authenticity, and trustworthiness have been associated with stronger parasocial relationships (Chung & Cho, 2017; Lacap et al., 2024; McLaughlin & Wohn, 2021; Rungruangjit, 2022; Yousaf, 2022). Self-disclosure can make influencers appear more open and accessible, while expertise and trustworthiness can strengthen perceptions of credibility and reliability (Chung & Cho, 2017; Cozby, 1973; Horton & Wohl, 1956; Johne, 2023). Recent sustainability research also suggests that these characteristics matter. Balaskas and Yfantidou (2026) found that influencer authenticity and parasocial relationships were positively associated with sustainable purchase intention, although green trust and prior exposure to greenwashing affected these relationships. This suggests that parasocial relationships may depend not only on perceived closeness but also on the credibility and context of sustainability communication.

Audience characteristics also contribute to parasocial relationships. Loneliness, personality traits, motivations, and perceived similarity have been identified as relevant factors (G. Liu, 2023; Mai et al., 2023;

McLaughlin & Wohn, 2021). Perceived similarity and value congruence may strengthen connections with influencers who share similar values, beliefs, and lifestyles (Chen et al., 2023; Ong et al., 2022; Zhao et al., 2022). However, similarity may work in both directions: it may initially encourage people to follow an influencer, while repeated engagement may further strengthen the sense of similarity and contribute to parasocial relationships.

Content characteristics also play an important role in shaping parasocial relationships. Informative, entertaining, useful, and relatable content can strengthen engagement and parasocial relationships (Mai et al., 2023). In sustainability contexts, however, information and relational connection may not have the same influence. She et al. (2025) found that engagement with green influencers was positively associated with online and offline pro-environmental behaviours, with perceived information value acting as a significant mediator, whereas parasocial relationships were not a significant mediator. This suggests that informational value may sometimes play a stronger role than emotional connection in shaping sustainability-related behaviour.

Parasocial relationships have also been linked to outcomes such as trust, engagement, behavioural intentions, and willingness to support influencers or their recommendations (Chung & Cho, 2017; Hwang & Zhang, 2018; Yılmazdoğan et al., 2021). Recent sustainability research, however, provides mixed evidence. Balaskas and Yfantidou (2026) found a positive relationship between parasocial relationships and sustainable purchase intention, whereas She et al. (2025) found no significant mediating effect of parasocial relationships on pro-environmental behaviours. These differences suggest that the effects of parasocial relationships may depend on the type of outcome and communication context rather than being commonly positive.

In general, existing research has provided important insights into the factors associated with parasocial relationships and their potential outcomes, but much of the literature remains focused on predetermined variables and behavioural outcomes. Less is known about how audiences themselves experience and interpret these relationships, particularly in sustainability contexts.

Parasocial Relationships Within the Sustainability Context

The emergence of sustainability influencers has expanded parasocial relationships of research into the field of sustainability communication. Unlike influencers who primarily focus on entertainment, lifestyle, or commercial promotion, sustainability influencers communicate environmental values, sustainable consumption practices, and everyday actions aimed at encouraging more responsible lifestyles. Therefore, parasocial relationships in this context may involve not only emotional connections with influencers but also shared commitments toward sustainability values and practices.

Previous studies have examined how parasocial relationships with sustainability influencers influence environmental

attitudes and behaviours. Cui et al. (2024) found that parasocial relationships with sustainability influencers contribute to the development of environmental identity, which subsequently supports sustainable consumption behaviours. Similarly, Sharma et al. (2024) demonstrated that the interaction between influencer-product congruence and parasocial relationships can enhance perceptions of product safety and support toward environmentally friendly products.

Other studies have highlighted the role of influencer characteristics in sustainability-related outcomes. Z. Xu et al. (2021) found that health-related homophily between sustainability influencers and audiences was associated with higher audience participation and parasocial relationships, which subsequently influenced sustainable food purchase intentions. However, when audiences perceived influencer content as purely advertising, purchase intentions decreased. In contrast, when promoted products were perceived as aligned with influencer characteristics, audience responses became more favourable. Luo et al. (2023) further demonstrated that sustainability influencers' expertise and task attractiveness contribute to parasocial relationships, which are associated with intentions to purchase energy-efficient products. Similarly, Horng et al. (2024) found that parasocial relationships with sustainability influencers were associated with intentions to support environmentally responsible hospitality practices and share related information. Beyond consumption-related outcomes, parasocial relationships with sustainability influencers may also encourage broader environmental engagement. Heleen Dekoninck and Schmuck (2024) showed that moderate levels of parasocial relationships with sustainability influencers may encourage youth environmental participation, although extremely strong parasocial relationships may shift attention away from collective environmental actions toward personal attachment to influencers.

Taken together, existing evidence indicates that parasocial relationships may play an important role in translating sustainability influencers' communication into audience responses, including environmental identity, sustainable consumption, purchase intentions, and environmental participation. However, the existing evidence remains fragmented, with studies addressing different antecedents, relational processes, and outcomes separately. Much of the research focuses on specific behavioural outcomes, particularly sustainable consumption and purchase intentions, while less attention has been given to how audiences interpret and experience these relationships, including the motivations underlying their formation and their broader implications.

Uses and Gratifications Theory

Uses and Gratifications Theory (UGT) explains media use as a goal-directed activity in which audiences actively select media to satisfy specific psychological and social needs (Katz et al., 1973). Within social media environments, users engage with content for various reasons, including

information seeking, entertainment, social interaction, community participation, and self-expression (Whiting & Williams, 2013). UGT has frequently been applied to understand audiences' motivations for engaging with media figures and developing parasocial relationships.

Previous studies suggest that audiences' motivations for engaging with media figures and developing parasocial relationships are associated with cognitive, affective, personal integrative, and social integrative needs (Rubin & Step, 2000; Ruggiero, 2000). For example, fans form parasocial relationships with celebrities and influencers to obtain information, seek entertainment, experience companionship, and interact with like-minded communities (Yang & Ha, 2021; Zafina & Sinha, 2024). These findings indicate that engagement with media figures may fulfil a range of informational, emotional, identity-related, and social needs, which can in turn facilitate the development of parasocial relationships.

Recent empirical research further demonstrates that social media gratifications are multidimensional and context-dependent. Falgoust et al. (2022), using qualitative interviews with young adults, identified entertainment, communication utility, social interaction, social support, information seeking and sharing, and escape as motivations for participating in TikTok challenges. Similarly, Keelson et al. (2024) found that happiness, destination image, behavioural goals, and access to tourism information were important factors underlying social media use in tourism decision-making. In sustainability-related contexts, Hornoiu et al. (2024) demonstrated that informativeness, playfulness, and social interactivity enhanced users' gratifications and behavioural involvement in virtual reality-based ecotourism. More recently, Li et al. (2026) found that Generation Z's engagement with eco-smart beauty products reflected gratifications related to green priorities, technological functionality, and adaptability to different usage situations. Taken together, these studies suggest that social media gratifications extend beyond conventional information and entertainment needs to include social, emotional, functional, and value-oriented needs, and that the relative importance of these gratifications may vary across platforms, content types, and social contexts.

The literature also suggests that gratifications may contribute to behavioural and relational outcomes rather than merely explaining media use. Wang and Oh (2023), for example, found that different forms of gratification significantly influenced consumers' continuous purchase intentions in TikTok livestreaming, with the effects varying according to education level. Hornoiu et al. (2024) further showed that uses and gratifications and behavioural involvement sequentially mediated the relationship between assigned responsibility and visit intentions in an ecotourism context. Meanwhile, Sun et al. (2025), examining Chinese edu-influencers on Xiaohongshu, identified information gaps, self-expression, social recognition, and personal fulfilment as important gratifications associated

with influencers' social media activities. Although these studies demonstrate the applicability of UGT across diverse digital contexts, they have largely focused on media use and consumer behaviour.

Consequently, less is known about how audience gratifications are related to the relational processes through which audiences develop ongoing connections with specific media figures. In particular, limited research has examined how audiences experience and interpret these motivations and how such motivations may contribute to the development of parasocial relationships with sustainability influencers. This gap is particularly important because, unlike entertainment celebrities or commercial influencers, sustainability influencers communicate not only information but also environmental values and sustainable lifestyles.

METHODS

Research Design

This study employed a qualitative descriptive approach and used thematic analysis to identify and interpret patterns of meaning across the qualitative data. Thematic analysis enables researchers to systematically explore shared and divergent perspectives among informants while generating rich insights into a particular phenomenon (Braun & Clarke, 2012). In the present study, this approach was used to examine audiences' motivations for developing parasocial relationships with a sustainability micro-influencer and their implications in the sustainability context.

The data for this study consist of statements made by followers of preselected sustainability micro-influencers on Instagram. The influencers were selected based on three criteria: (1) having between 10,000 and 100,000 followers, (2) maintaining an engagement rate above 3%, indicating strong audience interaction, and (3) consistently posting sustainability-related content for at least six months. Sustainability content was assessed by reviewing both the influencers' Instagram biographies and their posted content during the observation period. Influencers were included when they consistently communicated sustainability-related topics, such as environmentally responsible lifestyles, sustainable consumption practices, waste reduction, reuse, recycling, and environmental awareness.

Three sustainability micro-influencers met these criteria and were selected for the study: Cempaka Asriani (@casriani) (96,300 followers; 4.93% engagement rate), Cynthia Lestari (@cslestari) (47,700 followers; 5.99% engagement rate), and Novi (@ceritanupi) (86,100 followers; 6.54% engagement rate). The engagement rate was calculated using the formula provided by Socialinsider: engagement rate = [(total likes + total comments) / total posts] / total followers × 100. An engagement rate above 3% is generally considered indicative of strong audience interaction among Instagram creators. The selected influencers maintain publicly accessible Instagram accounts, and all data analysed in this study were obtained exclusively from publicly available materials posted on their accounts.

Informant and Data Collection

Purposeful sampling was employed to recruit followers who could provide rich and relevant insights into their parasocial relationships with sustainability micro-influencers. Informants were required to be Indonesian citizens aged 20-50 years, active Instagram users, have followed at least one of the selected micro-influencers for a minimum of six months, and demonstrate active engagement with the influencer's content through likes, comments, or reshares. The present study intentionally focused on highly engaged followers, as they were expected to provide richer accounts of their experiences and interactions with sustainability-related content.

Potential informants were identified based on their repeated interactions with the influencers' posts, particularly through comments posted on multiple occasions. Ten followers from each influencer account were invited via Instagram direct messages to participate in the study. Of the 30 invited followers, 15 agreed to participate in the interviews, comprising five followers from each influencer account. All informants had followed the selected sustainability micro-influencers for at least six months, and several had been following them long before the influencers gained wider recognition. Informants had also interacted with the influencers' content through likes, comments, or reshares, providing sufficient experience to reflect on their relationships with the influencers.

The interviews were conducted between March and April 2025 using semi-structured questions and were carried out through Zoom, telephone calls, Instagram direct messages (DM), and email, depending on informants' preferences and availability. Regardless of the interview mode, all informants were asked the same interview questions to ensure consistency throughout the data collection process. Synchronous interviews conducted via Zoom and telephone ranged from 11 to 29 minutes, whereas asynchronous interviews conducted through direct messages and email were completed within two days of correspondence. All interviews were conducted in Bahasa Indonesia. Quotations presented in this manuscript were translated into English and collaboratively reviewed by the authors to preserve their original meanings and contextual nuances. Data collection continued until thematic saturation was achieved. Saturation was determined when no substantially new codes or themes emerged from the final interviews, and recurring patterns were consistently observed across informants' accounts.

Data Analysis and Trustworthiness

The data were analysed using thematic analysis following Braun and Clarke's (2012) six-phase approach: familiarising with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the final report. The analysis adopted a hybrid approach that combines deductive and inductive coding. The concepts of parasocial relationships and Uses and Gratifications Theory (UGT) informed the initial analytical lens for understanding

audiences' motivations for engaging with sustainability micro-influencers, while an inductive approach allowed novel themes to emerge from the data beyond the existing theoretical framework. Initial codes and themes were collaboratively reviewed by the authors, and any differences in interpretation were discussed until consensus was reached.

To enhance the credibility and trustworthiness of the findings, data triangulation was employed by combining Instagram comments and semi-structured interviews. Researcher triangulation was also undertaken through collaborative discussions among the authors during the coding and theme development processes. Informants' identities have been anonymized using pseudonyms to protect their confidentiality.

Ethics Statement

This study was conducted under a research permit issued by the Faculty of Social and Political Sciences, Universitas Hasanuddin (Letter No. 02260/UN4.8/PT.01.06/2025). Ethical approval was not required under the institutional procedures applicable to this minimal-risk social science research involving adult informants. Before participation, all informants were informed about the purpose of the study, the voluntary nature of their participation, their right to withdraw at any time, and the measures taken to ensure confidentiality and anonymity. Written informed consent was obtained from all informants before the interviews were conducted and documented. All identifying information was removed from the dataset, and pseudonyms were used throughout the study to protect informants' identities.

RESULTS AND DISCUSSION

The informants are between 23 and 45 years old. Most of them are women, and primarily housewives, some of whom also work as freelance designers and live-streaming hosts. Others work as private employees, are self-employed, or are students. Four informants use Instagram for 1-2 hours daily, while most others use it for at least 30 minutes a day (Table 1).

The findings reveal 3 motivations to develop parasocial relationships dan several implications of the parasocial relationships in a sustainable context.

Followers' Motivations to Develop Parasocial Relationships with Sustainability Micro-influencers

Value Congruence

This study found that value congruence promotes parasocial relationships by fostering a sense of similarity and personal connection between followers and sustainability micro-influencers. When followers perceive that influencers share similar values, beliefs, and lifestyle aspirations, they are more likely to view them as relatable and personally relevant. Such perceived similarity reduces psychological distance and creates a sense of mutual understanding, making followers feel emotionally closer to the influencer.

One follower, for example, felt that a micro-influencer was particularly relevant

Table 1
The list of informants

Informants	Interview mode	Duration of Instagram use daily	Age	Profession
Follower 1	DM	1 hour	42	housewife
Follower 2	DM	1-2 hour(s)	28	host live-streaming & brand content creator
Follower 3	Phone call	45 minutes	45	entrepreneur
Follower 4	DM	5 hours	31	employee
Follower 5	Zoom (28 minutes 53 seconds)	1-2 hour(s)	23	student
Follower 6	E-mail	> 30 minutes	30	freelance designer
Follower 7	DM	10 hours	40	employee
Follower 8	DM	> 30 minutes	37	employee
Follower 9	DM	> 30 minutes	35	housewife
Follower 10	DM	1 hour	42	housewife
Follower 11	Phone call (11 minutes 38 seconds)	1-2 hour(s)	30	housewife
Follower 12	Phone call (18 minutes 23 seconds)	>2 hours	40	digital marketer
Follower 13	E-mail	1-2 hour(s)	25	freelancer
Follower 14	Phone call (17 minutes 14 seconds)	> 30 minutes	27	employee
Follower 15	E-mail	> 30 minutes	40	educator

Source: Authors' own work

because the content aligned with her ongoing journey from excessive consumption toward more conscious consumption.

> She also explains about sustainable living, which I happen to be trying to implement, that's why I follow her... I tend to follow people on Instagram who post about sustainable living, a minimalism lifestyle, and also health issues.
>
> (Follower 11)

Similarly, Follower 3 explained that she had already been practicing aspects of sustainable living before encountering the influencer and felt connected because the influencer's content reflected her own experiences and values.

> For the past roughly 7–10 years, I've been experiencing a life change, you know, to be less over-consumptive with things, so I think she is relatable to my life, that's why I ended up following her...
>
> (Follower 3)

These statements suggest that followers are not merely attracted to sustainability content itself but are drawn to influencers who reflect their existing values, aspirations, and life experiences. Consistent with the similarity-attraction perspective, individuals

are naturally inclined to develop closer relationships with others whom they perceive as sharing similar attitudes and values (Himelboim et al., 2013). In the context of sustainability communication, value congruence allows followers to see influencers as people who understand their concerns, struggles, and aspirations regarding sustainable living. This perceived similarity can generate feelings of resonance, identification, and emotional attachment toward the influencer, all of which are central to the development of parasocial relationships (Lou & Kim, 2019; Rojek, 2015).

In addition, this study found that value congruence extends beyond the influencer-follower relationship. Some followers were also motivated by the opportunity to connect with other individuals who shared similar sustainability values.

> Because the values are the same... maybe I can meet friends who have the same lifestyle. Because with small accounts, sometimes other followers like to comment.
>
> (Follower 12)

This suggests that parasocial relationships may be grounded within a broader sense of community, where followers not only identify with the influencer but also feel connected to other like-minded individuals. Such shared values can reinforce followers' sense of belonging and further strengthen their engagement with the micro-influencers and the sustainability community.

Current findings are consistent with previous studies showing that value congruence between audiences and influencers enhances perceived credibility, positive attitudes, behavioural intentions, and parasocial relationships (Ayeh et al., 2013; Djafarova & Rushworth, 2017; Sokolova & Kefi, 2020; Turner, 1993; Zhang et al., 2021; Zhao et al., 2022). Previous research has also found that greater perceived self-similarity with a media figure increases audiences' interest in learning more about that figure (Igartua & Barrios, 2012). Therefore, value congruence contributes to parasocial relationships not only by fostering perceived similarity between followers and influencers but also by creating a sense of shared identity and belonging around sustainability values.

Accessible Communication

This finding suggests that accessible communication contributes to parasocial relationships because sustainability messages are communicated in ways that are easy to understand, relatable, and conversational, thereby reducing the perceived distance between influencers and their followers. Several followers noted that micro-influencers use simple language and avoid technical jargon.

> The way they deliver is quite understandable. From the language to current terms, and they usually explain things again.
>
> (Follower 8)

According to Abbati (2019), using clear, simple, and unambiguous language while

avoiding difficult terms can help ensure that messages are well received. In the context of sustainability communication, such an approach may also make sustainability issues feel less complex and more relevant to followers' everyday lives, enabling audiences to engage with the content more comfortably.

Beyond facilitating understanding, accessible communication appears to foster a sense of personal connection between micro-influencers and followers. Several followers expressed that, rather than positioning themselves as authoritative experts, sustainability micro-influencers communicate in a friendly, conversational, and non-judgmental manner that reduces the perceived distance between themselves and their audiences. For example, Follower 1 stated,

> Their way of delivering content is fun for me, it's not preachy or forceful, but more inviting... "Come on, let's start living economically... you don't have to own everything, you know!"
>
> (Follower 1)

Similarly, Followers 9 and 10 explained that they felt connected to the influencers because they communicated casually, as if speaking with a friend. This conversational style may encourage followers to perceive micro-influencers as approachable and relatable figures rather than distant experts. As Horton and Wohl (1956) argue, feelings of familiarity and perceived interpersonal connection are central characteristics of parasocial relationships.

Furthermore, when sustainability messages are framed as friendly invitations rather than instructions, followers may feel that influencers understand the challenges they face in adopting sustainable lifestyles. This perception can strengthen feelings of intimacy, companionship, and mutual understanding, which are important elements of parasocial relationships. These findings are consistent with previous studies showing that conversational interactions, perceived intimacy, and feelings of closeness positively contribute to the development of parasocial relationships (Shan et al., 2020; Y. Xu et al., 2023). Likewise, Rojek (2015) emphasises that perceived closeness and intimacy toward media figures are fundamental to the formation of parasocial relationships. Therefore, accessible communication not only enhances followers' understanding of sustainability issues but also helps cultivate the sense of familiarity and psychological closeness that underpins parasocial relationships.

Relatable and Practical Sustainability Practices

This finding suggests that followers develop parasocial relationships with sustainability micro-influencers because the sustainability practices they demonstrate are perceived as relatable, practical, and achievable in everyday life. Rather than presenting sustainability as a complex or idealised lifestyle, micro-influencers integrate sustainable practices into ordinary daily activities, making it easier for followers to understand and adopt. As a result,

followers are able to see reflections of their own lives and experiences in influencers' content, fostering a sense of familiarity and personal relevance. Follower 14, for example, described how sustainability content became relatable because it was ingrained in everyday routines rather than highly produced or unrealistic scenarios.

> It's part of everyday life, you know. So, we can relate to it... Going to the market is something everyone experiences... It's not heavily edited content, just a daily vlog about sustainable living... She simply shows herself going to the market and bringing her own container instead of using plastic bags. It's simple.
>
> (Follower 14)

Similarly, Follower 5 perceived sustainability practices as accessible because the influencer demonstrated how ordinary household items could be reused, recycled, or utilised more mindfully.

> In every piece of content, she shows that the things we see around us can be reconsidered, recycled, reused, or used more wisely.
>
> (Follower 5)

These findings indicate that followers are more likely to connect with sustainability micro-influencers when sustainability is presented as something achievable within their existing circumstances and resources. Rather than portraying sustainability as expensive, complicated, or unachievable, influencers demonstrate practical actions that followers can realistically incorporate into their daily lives.

Such representations may strengthen parasocial relationships because followers perceive influencers as relatable individuals facing similar everyday situations rather than distant experts promoting idealised lifestyles. Previous studies similarly suggest that presenting personal and everyday experiences can foster trust, engagement, and emotional closeness with audiences, thereby facilitating the development of parasocial relationships (Närvänen et al., 2021). Likewise, portraying ordinary and relatable aspects of life has been shown to encourage emotional connection with media figures (Ilicic & Wesbter, 2016). Moreover, creating and delivering content aligned with everyday reality can foster empathy and minimize rejection (Bickart & Schindler, 2001). By setting sustainability in everyday realities, micro-influencers make sustainable living appear more achievable while concurrently fostering a sense of familiarity and psychological closeness among followers.

Implications of Parasocial Relationships with Sustainability Micro-influencers

Supportive and Defensive Engagement

This study suggests that parasocial relationships with sustainability micro-influencers may encourage supportive and defensive forms of audience engagement. Several followers described engaging with micro-influencers' content by liking, commenting on, sharing posts, and following their accounts. While these behaviours may

represent routine forms of engagement on social media, some followers also reported stronger actions that reflected emotional investment in the micro-influencer and the sustainability messages they promoted.

Follower 4, for example, explained that they had followed a particular micro-influencer since the early stages of their content creation journey, when the account had relatively few followers. The informant described intentionally supporting the micro-influencer's content as a way of expressing appreciation and encouraging the micro-influencer to continue promoting sustainability issues.

> To appreciate her and hopefully it boosts her spirit to consistently create content, so more people might be positively influenced by her content.
>
> (Follower 4)

Similarly, Follower 6 reported downloading and sharing the influencer's content within their own social networks. These findings are consistent with previous studies suggesting that parasocial relationships can encourage audiences to share influencer content and engage in word-of-mouth behaviours (Hwang & Zhang, 2018; Makmor et al., 2024; Wahab et al., 2025).

Beyond routine engagement, some followers described actively defending sustainability of micro-influencers when they encountered criticism or negative comments. Follower 13 explained that they intentionally left supportive comments in response to negative reactions directed at the influencer.

> I tend to be selective when liking and commenting on other people's posts. The reason I liked and commented on that post was that there were many negative comments, and for some reason, I wanted to leave a positive comment. A positive comment can help keep their spirits up in creating content.
>
> (Follower 13)

These findings suggest that some followers move beyond passive content consumption and become active supporters of both the micro-influencer and the sustainability messages. Such behaviour may reflect the emotional closeness associated with parasocial relationships, which can foster feelings of care, solidarity, and a desire to support media figures who are perceived positively (Claessens & Van Den Bulck, 2015; Nadzira & Annapurna, 2024). At the same time, this supportive and defensive engagement may also be influenced by followers' shared sustainability values and their commitment to the environmental causes advocated by the influencer. Therefore, the findings suggest that parasocial relationships and value alignment may jointly encourage audiences to support and defend sustainability micro-influencers.

Positive Emotional and Attitude Changes

This study found that parasocial relationships with sustainability micro-influencers were associated with positive emotional and attitudinal changes among followers. Several followers described becoming more confident, satisfied, and

appreciative of what they already owned, while also developing a greater awareness of sustainable consumption practices. These changes reflected a shift away from excessive consumption toward more mindful and sustainable lifestyles.

> I also feel more confident and love what I currently have. I don't want to have the same standards as others, because what I have is enough.
>
> (Follower 2)

> I'm happier because my savings, thank God... Before, it was hard for me to save; every payday was spent on clothes, shoes.
>
> (Follower 4)

These findings suggest that parasocial relationships may extend beyond fostering emotional attachment to influencers and contribute to how followers perceive themselves and evaluate their consumption behaviours. Through repeated exposure to sustainability-related content and the emotional connection established with influencers, followers may internalize sustainability values and become more accepting of lifestyles that prioritise sufficiency rather than constant acquisition. Such changes are reflected not only in followers' behaviours but also in their feelings of self-confidence, satisfaction, and happiness. This finding aligns with previous studies suggesting that sustainability influencers can encourage audiences to adopt more positive attitudes toward sustainable living and reshape consumption-related values and behaviours (Breves & Liebers, 2022; Dekoninck et al., 2023; Horng et al., 2024).

Behavioural Changes and Implementation Challenges

This study found that followers perceived sustainability micro-influencers as contributing to changes in their consumption practices and sustainability-related behaviours. Several followers described modifying their behaviours after regularly engaging with influencers' content, including reducing excessive consumption, adopting reusable products, and purchasing environmentally friendly alternatives. These findings suggest that parasocial relationships may provide inspiration and motivation for behavioural change, although such changes are likely shaped by multiple personal and contextual factors, such as financial situation, environmental awareness, or other media resources.

Follower 4, for example, described a shift from frequent and trend-driven purchasing toward more mindful consumption. Reflecting on this change, she explained:

> The pattern I've followed is definitely reducing shopping... For example, no longer buying new lipstick, new clothes, unless the lipstick runs out...
>
> (Follower 4)

Similarly, other followers reported adopting practical sustainability behaviours such as bringing reusable shopping bags, tumblers, and food containers. They also described changing their purchasing

decisions by choosing products perceived as more environmentally friendly.

> Because they also tell some people and show some products that might be more environmentally friendly in terms of ingredients, so I started switching to some green detergents...
>
> (Follower 13)

These findings suggest that followers perceived sustainability micro-influencers as important sources of information, inspiration, and practical guidance for adopting more sustainable lifestyles. Consistent with a previous study, the findings suggest that sustainability micro-influencers may serve as important sources of information and inspiration, while parasocial relationships may increase followers' receptiveness to sustainability messages and environmentally responsible practices (Knupfer et al., 2023).

However, an interesting finding is that behavioural change was not always experienced as a straightforward process. Several followers acknowledged difficulties when attempting to translate sustainability ideals into everyday practices.

> Yes, it (bringing a reusable bag to the market) is complicated... there has to be certain criteria. You can't change 100% immediately, at least reduce.
>
> (Follower 14)

This finding suggests that while sustainability micro-influencers may inspire followers to adopt more environmentally responsible lifestyles, the implementation of these practices is often constrained by everyday realities and personal circumstances. Followers recognised the value of sustainable living, but they also experienced practical challenges, inconvenience, and the need for gradual adaptation. Rather than indicating rejection of sustainability values, these difficulties highlight that behavioural change is often a complex and ongoing process. Thus, although followers perceived sustainability micro-influencers as contributing to their behavioural changes, the adoption of sustainable practices appeared to occur gradually rather than through immediate transformation.

Reinforcement of Sustainability Values and Practices

This study found that parasocial relationships with sustainability micro-influencers help reinforce followers' commitment to sustainability values and practices. Rather than introducing entirely new behaviours, the emotional connection developed with micro-influencers often strengthened existing sustainability values and encouraged followers to remain consistent in practicing sustainable lifestyles. Several followers indicated that they had already adopted sustainable behaviours before following the influencers. However, observing sustainability micro-influencers consistently promote similar values helped validate and reinforce these practices. For example, Follower 6 explained that,

> I already brought my own tumbler. If I forget to bring it and I am not really

> thirsty, I usually choose not to buy bottled drinks. I also recycle plastic waste and rarely buy new clothes. Actually, I did not start buying fewer clothes because of Nupi (name of the micro-influencer-added by the author), as I had already been practicing that before. But when many influencers also adopt this lifestyle, it feels good because you do not feel alone.
>
> (Follower 6)

A similar statement came from two different followers. Follower 13 explained that,

> Actually, I already had that habit, but sometimes I get lazy. Because there is someone, I call a 'trigger' or this influencer, I feel that I can reduce waste by bringing my own food containers.
>
> (Followe 13)

These statements suggest that sustainability micro-influencers did not necessarily initiate these behaviours but reinforce practices that followers had already adopted. The presence of sustainability micro-influencers who consistently communicate similar practices appears to validate followers' lifestyle choices and provide encouragement to maintain them. Followers may feel reassured that their sustainability efforts are meaningful and shared by others, reducing feelings of isolation that can arise when practicing less common lifestyle choices. Therefore, parasocial relationships with sustainability micro-influencers may contribute to the reinforcement and maintenance of existing sustainability values and behaviours over time.

Sense of Companionship and Belonging

This study also found that parasocial relationships with sustainability micro-influencers foster a sense of companionship and belonging among followers. Several followers described feeling accompanied, understood, and socially supported in their sustainability journeys, particularly when sustainable lifestyles were not widely practiced within their immediate social environments. For example, Follower 12 explained that few people in their social circle shared an interest in sustainability practices such as composting. As a result, sustainability micro-influencers' presence helped reduce feelings of isolation:

> If many influencers practice this kind of lifestyle, it's actually nice, you don't feel alone because sometimes we feel like we're the only one who is doing this practice. Because if I sometimes ask my friends in a group chat, I always ask, 'Is anyone here into composting?' The answer must be no one, right? So, I'm doing it alone.
>
> (Follower 12)

Current findings suggest that sustainability micro-influencers serve not only as information providers but also as symbolic companions who validate followers' experiences and lifestyle choices. Through repeated exposure to sustainability micro-influencers who share similar concerns and values, followers may develop a sense

that they are part of a broader community of individuals committed to sustainability. Such feelings can be particularly important when sustainable practices are perceived as uncommon or difficult to maintain within one's immediate social environment.

In the context of parasocial relationships, this experience reflects a sense of companionship, whereby media figures provide emotional support and a feeling of social connection despite the absence of direct reciprocal interaction (Lee & Lee, 2017). Previous studies have similarly shown that individuals use media to satisfy companionship needs (Rubin, 1984; Song et al., 2004) and that feelings of companionship contribute to positive emotional experiences and psychological well-being (Baldassare et al., 1984; Feng et al., 2025). Extending this literature, the present study suggests that parasocial relationships with sustainability micro-influencers may foster not only emotional connection with the influencer but also a sense of belonging to a community that shares similar sustainability values and aspirations.

CONCLUSION

This study aims to explore followers' motivations for developing parasocial relationships with sustainability micro-influencers on Instagram and to examine the implications of the relationships in the sustainability context. The findings reveal that parasocial relationships are fostered through accessible communication, value congruence, and the perceived relevance and practicality of sustainability practices demonstrated by micro-influencers. These characteristics make sustainability messages more relatable and personally meaningful, encouraging followers to perceive influencers as approachable and familiar figures.

The study also demonstrates that parasocial relationships have several important implications in the sustainability context. Beyond fostering emotional closeness, these relationships encourage followers to support and defend sustainability micro-influencers, reinforce existing sustainability values and practices, provide a sense of companionship in pursuing sustainable lifestyles, and contribute to positive emotional, attitudinal, and behavioural changes. However, the findings also indicate that adopting sustainable practices is often a gradual and challenging process shaped by everyday constraints and personal circumstances.

IMPLICATIONS OF THE STUDY

Theoretically, this study extends the parasocial relationship literature by demonstrating that the development of parasocial relationships in the sustainability context is influenced not only by characteristics or attribute of micro-influencers but also by the sustainability values and practices presented. The findings show that accessible communication, value congruence, and the perceived relevance and practicality of sustainability practices contribute to the formation of parasocial

relationships with sustainability micro-influencers. Furthermore, this study expands existing research by highlighting that the implications of parasocial relationships in the sustainability context extend beyond behavioural outcomes to include emotional support, companionship, and the reinforcement of sustainability values and practices. By focusing on audiences' perspectives, this study provides a more nuanced understanding of how parasocial relationships operate within a sustainability context.

Practically, the findings suggest that sustainability micro-influencers can strengthen audience engagement by communicating sustainability issues in accessible, relatable, and non-judgmental ways. Rather than relying solely on educational or persuasive appeals, influencers may foster stronger connections with audiences by demonstrating sustainability practices through everyday experiences that followers perceive as realistic and achievable. The findings also indicate the importance of emphasising shared values and creating a sense of community among followers, as these factors help audiences feel supported in their sustainability journeys. For organizations, environmental campaigns, and sustainability advocates seeking to promote sustainable lifestyles through social media, collaborating with sustainability micro-influencers may therefore represent an effective strategy for fostering long-term engagement with sustainability values and practices.

LIMITATIONS AND RECOMMENDATION FOR FUTURE STUDIES

This study has several limitations that need consideration. First, the informants were not drawn from a specific age group, which may have limited the exploration of potential differences in how individuals from different generations experience parasocial relationships and engage with sustainability practices. In addition, the gender composition of the informants was not evenly distributed, which may have influenced the range of perspectives represented in the findings.

This study may also be subject to self-selection bias, as it primarily involved highly engaged followers who were willing to participate and actively interact with the sustainability influencer. As a result, the experiences of passive followers, critical followers, and former followers were not captured. Their perspectives may offer valuable insights into different forms of audience engagement and disengagement in parasocial relationships. Additionally, information regarding whether followers followed more than one sustainability influencer and whether influencers had replied to their comments or direct messages was not systematically collected, as these factors were beyond the scope of the present study. These factors may influence the development and strength of parasocial relationships and therefore warrant further investigation. Furthermore, because the study employed a cross-sectional design,

it provides only a snapshot of followers' experiences and cannot capture how parasocial relationships and sustainability-related practices develop or change over time. The behavioural changes reported by followers were also based on self-reported accounts and were not independently verified.

Future studies could address these limitations by focusing on specific age groups and ensuring a more balanced gender composition among informants. Including followers with different levels of engagement, ranging from highly engaged to passive or former followers, would provide a more nuanced understanding of parasocial relationships with sustainability influencers. Future research should also examine how following multiple sustainability influencers and receiving direct responses from influencers may shape the formation, intensity, and outcomes of parasocial relationships. Longitudinal research may also help explain how these relationships evolve and whether they contribute to sustained sustainability practices over time. Finally, comparative studies across different social media platforms, such as Instagram, TikTok, and YouTube, could further explain how platform characteristics shape parasocial relationships and audience engagement with sustainability influencers.

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REFERENCES

Abbati, M. (2019). *Communicating the environment to save the planet: A journey into eco-communication*. Springer. https://doi.org/10.1007/978-3-319-76017-9

Asosiasi Penyelenggara Jasa Internet Indonesia. (2026). *Profil internet Indonesia 2026: Survei penetrasi internet dan perilaku penggunaan internet*.

Ayeh, J. K., Au, N., & Law, R. (2013). Predicting the intention to use consumer-generated media for travel planning. *Tourism Management, 35*, 132-143. https://doi.org/10.1016/j.tourman.2012.06.010

Balaskas, S., & Yfantidou, I. (2026). Cross-national evidence on influencer-driven green choice: A moderated-mediation model of authenticity, parasocial ties, and greenwashing exposure. *Frontiers in Communication, 11*, Article 1764803. https://doi.org/10.3389/fcomm.2026.1764803

Baldassare, M., Rosenfield, S., & Rook, K. (1984). The types of social relations predicting elderly well-being. *Research on Aging, 6*(4), 549-559. https://doi.org/10.1177/0164027584006004006

Bickart, B., & Schindler, R. M. (2001). Internet forums as influential sources of consumer information. *Journal of Interactive Marketing, 15*(3), 31-40. https://doi.org/10.1002/dir.1014

Braun, V., & Clarke, V. (2012). Thematic analysis. In H. Cooper, P. M. Camic, D. L. Long, A. T. Panter, D. Rindskopf, & K. J. Sher (Eds.), *APA handbook of research methods in psychology: Vol. 2. Research designs: Quantitative, qualitative, neuropsychological, and biological* (pp. 57-71). American Psychological Association. https://doi.org/10.1037/13620-004

Breves, P., & Liebers, N. (2022). #Greenfluencing: The impact of parasocial relationships with social media influencers on advertising effectiveness and followers' pro-environmental intentions. *Environmental Communication, 16*(6), 773-787. https://doi.org/10.1080/17524032.2022.2109708

Chen, W.-K., Silaban, P. H., Hutagalung, W. E., & Silalahi, A. D. K. (2023). How Instagram influencers contribute to consumer travel decision: Insights from SEM and fsQCA. *Emerging Science Journal, 7*(1), 16-37. https://doi.org/10.28991/ESJ-2023-07-01-02

Chung, S., & Cho, H. (2017). Fostering parasocial relationships with celebrities on social media: Implications for celebrity endorsement. *Psychology & Marketing, 34*(4), 481-495. https://doi.org/10.1002/mar.21001

Claessens, N., & Van den Bulck, H. (2015). Parasocial relationships with audiences' favorite celebrities: The role of audience and celebrity characteristics in a representative Flemish sample. *Communications, 40*(1), 43-65. https://doi.org/10.1515/commun-2014-0027

Cozby, P. C. (1973). Self-disclosure: A literature review. *Psychological Bulletin, 79*(2), 73-91. https://doi.org/10.1037/h0033950

Cui, T., Tang, S., & Iqbal, Q. (2024). The role of green influencers on users' green consumption intention: An empirical study from China and Pakistan. *Asia Pacific Journal of Marketing and Logistics*. https://doi.org/10.1108/APJML-05-2024-0561

Dekoninck, H., & Schmuck, D. (2024). The "greenfluence": Following environmental influencers, parasocial relationships, and youth's participation behavior. *New Media & Society, 26*(11), 6615-6635. https://doi.org/10.1177/14614448231156131

Dekoninck, H., Van Houtven, E., & Schmuck, D. (2023). Inspiring G(re)en Z: Unraveling (para) social bonds with influencers and perceptions of their environmental content. *Environmental Communication, 17*(7), 701-719. https://doi.org/10.1080/17524032.2023.2237693

Djafarova, E., & Rushworth, C. (2017). Exploring the credibility of online celebrities' Instagram profiles in influencing the purchase decisions of young female users. *Computers in Human Behavior, 68*, 1-7. https://doi.org/10.1016/j.chb.2016.11.009

Eldon, M., Ashari, R. W., & Waskita, G. S. (2025). The rise of greenfluencers: Micro-influencer impact on sustainable product purchase intention. *Jurnal Kelitbangan, 13*(1). https://doi.org/10.35450/jip.v13i1.1020

Falgoust, G., Winterlind, E., Moon, P., Parker, A., Zinzow, H., & Chalil, K. (2022). Human factors in healthcare: Applying the uses and gratifications theory to identify motivational factors behind young adults' participation in viral social media challenges on TikTok. *Human Factors in Healthcare, 2*, Article 100014. https://doi.org/10.1016/j.hfh.2022.100014

Feng, Y., Meng, J., & Cheah, J.-H. (2025). From virtual trainers to companions? Examining how digital agency types, anthropomorphism, and support shape parasocial relationships in online fitness. *Psychology & Marketing, 42*, 842-865. https://doi.org/10.1002/mar.22154

Forster, R. T. (2011). Para-romantic love and para-friendships: Development and assessment of a multiple-parasocial relationships scale. *American Journal of Media Psychology, 3*(1-2), 73-94.

Forster, R. T., Walter, N., & Saucier, C. J. (2021). Antecedents and effects of parasocial relationships: A meta-analysis. *Journal of Communication, 70*(6), 868-894. https://doi.org/10.1093/joc/jqaa034

Graham-Rowe, E., Jessop, D. C., & Sparks, P. (2019). Self-affirmation theory and pro-environmental behaviour: Promoting a reduction in household food waste. *Journal of Environmental Psychology, 62*, 124-132. https://doi.org/10.1016/j.jenvp.2019.02.003

Grau, S. L. (2022). *Celebrity 2.0: The role of social media influencer marketing in building brands*. Business Expert Press.

Hartmann, T., & Goldhoorn, C. (2011). Horton and Wohl revisited: Exploring viewers' experience of parasocial interaction. *Journal of Communication*, *61*(6), 1104-1121. https://doi.org/10.1111/j.1460-2466.2011.01595.x

Hartmann, T., Stuke, D., & Daschmann, G. (2008). Positive parasocial relationships with drivers affect suspense in racing sport spectators. *Journal of Media Psychology, 20*(1), 24-34. https://doi.org/10.1027/1864-1105.20.1.24

Himelboim, I., McCreery, S., & Smith, M. (2013). Birds of a feather tweet together: Integrating network and content analyses to examine cross-ideology exposure on Twitter. *Journal of Computer-Mediated Communication, 18*(2), 40-60. https://doi.org/10.1111/jcc4.12001

Horng, J.-S., Liu, C.-H., Chou, S.-F., Yu, T., & Hu, D.-C. (2024). Role of social media influencers on marketing of sustainable hotels: Gratification and the parasocial interaction perspective. *Journal of Hospitality Marketing & Management, 33*(6), 735-762. https://doi.org/10.1080/19368623.2024.2315947

Hornoiu, R., Popescu, D., Militaru, I., De Pascale, A., Poenaru, L., & Breabăn, M. L. (2024). Beyond the screen: How virtual reality shapes sustainable behaviors in ecotourism through uses and gratifications theory. *Cactus Tourism Journal, 6*(1), 16-27. https://doi.org/10.24818/CTS/6/2024/1.03

Horton, D., & Wohl, R. R. (1956). Mass communication and para-social interaction. *Psychiatry, 19*(3), 215-229. https://doi.org/10.1080/00332747.1956.11023049

Hwang, K., & Zhang, Q. (2018). Influence of parasocial relationship between digital celebrities and their followers on followers' purchase and electronic word-of-mouth intentions, and persuasion knowledge. *Computers in Human Behavior, 87*, 155-173. https://doi.org/10.1016/j.chb.2018.05.029

Igartua, J. J., & Barrios, I. (2012). Changing real-world beliefs with controversial movies: Processes and mechanisms of narrative persuasion. *Journal of Communication, 62*(3), 514-531. https://doi.org/10.1111/j.1460-2466.2012.01640.x

Ilicic, J., & Webster, C. M. (2016). Being true to oneself: Investigating celebrity brand authenticity. *Psychology & Marketing, 33*(6), 410-420. https://doi.org/10.1002/mar.20887

Johne, J. (2023). *Effectiveness of influencer marketing*. Springer. https://doi.org/10.1007/978-3-658-41297-5

Katz, E., Blumler, J. G., & Gurevitch, M. (1973). Uses and gratifications research. *The Public Opinion Quarterly, 37*(4), 509-523. https://doi.org/10.1086/268109

Keelson, S. A., Bruce, E., Egala, S. B., Amoah, J., & Bashiru Jibril, A. (2024). Driving forces of social media and its impact on tourists' destination decisions: A uses and gratification theory. *Cogent Social Sciences, 10*(1), Article 2318878. https://doi.org/10.1080/23311886.2024.2318878

Knupfer, H., Neureiter, A., & Matthes, J. (2023). From social media diet to public riot? Engagement with "greenfluencers" and young social media users' environmental activism. *Computers in Human Behavior, 139*, Article 107527. https://doi.org/10.1016/j.chb.2022.107527

Labrecque, L. I. (2014). Fostering consumer-brand relationships in social media environments: The role of parasocial interaction. *Journal of Interactive Marketing, 28*(2), 134-148. https://doi.org/10.1016/j.intmar.2013.12.003

Lacap, J. P. G., Cruz, M. R. M., Bayson, A. J., Molano, R., & Garcia, J. G. (2024). Parasocial relationships and social media interactions: Building brand credibility and loyalty. *Spanish Journal of Marketing—ESIC, 28*(1), 77-97. https://doi.org/10.1108/SJME-09-2022-0190

Lawrence, C., & Meivitawanli, B. (2023). The role of parasocial relationships, congruence, and source credibility in Indonesia: A study on TikTok live-streaming commerce in the cosmetics industry. *Australasian Accounting, Business and Finance Journal, 17*(5), 39-51. https://doi.org/10.14453/aabfj.v17i5.05

Lee, J. E., & Watkins, B. (2016). YouTube vloggers' influence on consumer luxury brand perceptions and intentions. *Journal of Business Research, 69*(12), 5753-5760. https://doi.org/10.1016/j.jbusres.2016.04.171

Lee, S. A., & Lee, M. (2017). Effects of relationship types on customers' parasocial interactions: Promoting relationship marketing in social media. *Journal of Hospitality and Tourism Technology, 8*(1), 133-147. https://doi.org/10.1108/JHTT-09-2016-0053

Li, X., Yuan, D., & Zhang, Y. (2026). Z-generation's consumption demand for eco-smart beauty device: Uses and gratifications theory. In *Proceedings of the 9th International Conference on Business and Information Management (ICBIM '25)*. https://doi.org/10.1145/3785171.3785205

Liang, J., Li, J., Cao, X., & Zhang, Z. (2024). Generational differences in sustainable consumption behavior among Chinese residents: Implications based on perceptions of sustainable consumption and lifestyle. *Sustainability, 16*(10), Article 3976. https://doi.org/10.3390/su16103976

Lin, P., & Chen, W. (2022). Factors that influence consumers' sustainable apparel purchase intention: The moderating effect of generational cohorts. *Sustainability, 14*(14), Article 8950. https://doi.org/10.3390/su14148950

Liu, G. (2023). A review of the mechanism of the influencer. In *Proceedings of the International Conference on Global Politics and Socio-Humanities* (pp. 109-114). https://doi.org/10.54254/2753-7048/21/2023009

Liu, J. (2023). Virtual presence, real connections: Exploring the role of parasocial relationships in virtual idol fan community participation. *Global Media and China*. Advance online publication. https://doi.org/10.1177/20594364231222976

Lou, C., & Kim, H. K. (2019). Fancying the new rich and famous? Explicating the roles of influencer content, credibility, and parental mediation in adolescents' parasocial relationship, materialism, and purchase intentions. *Frontiers in Psychology, 10*, Article 2567. https://doi.org/10.3389/fpsyg.2019.02567

Lubowiecki-Vikuk, A., Dąbrowska, A., & Machnik, A. (2021). Responsible consumer and lifestyle: Sustainability insights. *Sustainable Production and Consumption, 25*, 91-101. https://doi.org/10.1016/j.spc.2020.08.007

Luo, B., Nie, M., & Ji, H. (2023). The influence of internet celebrities' expertise and attraction on residents' intention to purchase household energy-saving products in the context of an online community. *Energies, 16*(8), Article 3332. https://doi.org/10.3390/en16083332

Mai, T. D. P., To, A. T., Trinh, T. H. M., Nguyen, T. T., & Le, T. T. T. (2023). Para-social interaction and trust in live-streaming sellers. *Emerging Science Journal, 7*(3), 744-754. https://doi.org/10.28991/ESJ-2023-07-03-06

Makmor, N., Hafiz, K. A., Anuar, A., & Sofian, F. (2024). Impact of para-social interaction on impulsive buying through live-streaming shopping website. *Environment and Social Psychology, 9*(5), 1-10. https://doi.org/10.54517/esp.v9i5.2089

McLaughlin, C., & Wohn, D. Y. (2021). Predictors of parasocial interaction and relationships in live streaming. *Convergence, 27*(6), 1714-1734.

Mirnaaf. (2024). *Rekomendasi influencer Indonesia niche gaya hidup ramah lingkungan*. https://www.mirnaaf.com/2024/10/rekomendasi-influencer-eco-friendly.html

Monga, D., & Gupta, S. (2024). Social media influencers in marketing. In *Reference module in social sciences*. Elsevier. https://doi.org/10.1016/B978-0-443-13701-3.00468-0

Nadzira, Z., & Annapurna, S. (2024). Celebrity-fan relationship: Studying Taylor Swift and Indonesian Swifties' parasocial relationships on social media. *Media Asia*. Advance online publication. https://doi.org/10.1080/01296612.2024.2304422

Närvänen, E., Kirvesmies, T., & Kahri, E. (2021). Parasocial relationships of Generation Z consumers with social media influencers. In S. Yesiloglu & J. Costello (Eds.), *Influencer marketing: Building brand communities and engagement*. Routledge. https://doi.org/10.4324/9780080557700

Ong, Y. X., Sun, T., & Ito, N. (2022). Beyond influencer credibility: The power of content and parasocial relationship on processing social media influencer destination marketing campaigns. In J. L. Stienmetz, B. Ferrer-Rosell, & D. Massimo (Eds.), *Information and communication technologies in tourism 2022* (pp. 110-122). Springer. https://doi.org/10.1007/978-3-030-94751-4_44

Pertiwi, W. N. B., Lusianingrum, F. P. W., Widikusyanto, M. J., & Purbohastuti, A. W. (2025). The influence of greenfluencer personal branding on green purchasing behavior through green trust. *Creative Research Management Journal, 8*(1), 1-16. https://doi.org/10.32663/8tn7gj28

Pristiandaru, D. L. (2024, October 14). *Deforestasi RI terburuk kedua di dunia, 1,18 juta hektare hutan rusak*. Kompas.com. https://lestari.kompas.com/read/2024/10/14/150000086/deforestasi-ri-terburuk-kedua-di-dunia-1-18-juta-hektare-hutan-rusak

Rojek, C. (2015). *Presumed intimacy: Parasocial interaction in media, society and celebrity culture*. Polity.

Rubin, A. M. (1984). Ritualized and Instrumental Television Viewing. *Journal of Communication*, *34*(3), 67-77. https://doi.org/10.1111/j.1460-2466.1984.tb02174.x

Rubin, A. M., & Step, M. M. (2000). Impact of motivation, attraction, and parasocial interaction on talk radio listening. *Journal of Broadcasting & Electronic Media, 44*(4), 635-654. https://doi.org/10.1207/s15506878jobem4404_7

Ruggiero, T. E. (2000). Uses and gratifications theory in the 21st century. *Mass Communication & Society, 3*(1), 3-37. https://doi.org/10.1207/S15327825MCS0301_02

Rungruangjit, W. (2022). What drives Taobao live streaming commerce? The role of parasocial relationships, congruence, and source credibility in Chinese consumers' purchase intentions. *Heliyon, 8*(6), Article e09676. https://doi.org/10.1016/j.heliyon.2022.e09676

Santateresa-Bernat, P., Sánchez-García, I., & Curras-Perez, R. (2023). I like you, or I like what you say? Effect of influencer on tourists' behaviours. *Current Issues in Tourism, 26*(19), 3160-3174. https://doi.org/10.1080/13683500.2022.2108771

Shan, Y., Chen, K. J., & Lin, J. S. (2020). When social media influencers endorse brands: The effects of self-influencer congruence, parasocial identification, and perceived endorser motive. *International Journal of Advertising, 39*(5), 590-610. https://doi.org/10.1080/02650487.2019.1678322

Sharma, R., Singh, P., & Sharma, A. (2024). Unleashing green beauty crusade: Role of influencer relational characteristics, product perceptions, and warm glow. *Journal of Electronic Commerce Research, 25*(4), 223-241.

She, S., Wang, B., Li, S., & Jiang, R. (2025). How green influencers stimulate pro-environmental behavior? The roles of perceived information value and parasocial relationship. *SSRN*. https://doi.org/10.2139/ssrn.5587959

Snapcart. (2024). *Indonesian consumers' interest toward sustainable products: Part 2*. https://snapcart.global/indonesian-consumers-interest-toward-sustainable-products-part-2/

Sokolova, K., & Kefi, H. (2020). Instagram and YouTube bloggers promote it, why should I buy? How credibility and parasocial interaction influence purchase intentions. *Journal of Retailing and Consumer Services, 53*, Article 101742. https://doi.org/10.1016/j.jretconser.2019.01.011

Sokolova, K., & Perez, C. (2021). You follow fitness influencers on YouTube. But do you actually exercise? How parasocial relationships and watching fitness influencers relate to intentions to exercise. *Journal of Retailing and Consumer Services, 58*, Article 102276. https://doi.org/10.1016/j.jretconser.2020.102276

Song, I., Larose, R., Eastin, M. S., & Lin, C. A. (2004). Internet gratifications and internet addiction: On the uses and abuses of new media. *CyberPsychology & Behavior, 7*(4), 384-394. https://doi.org/10.1089/cpb.2004.7.384

Sun, L., Zhou, K., Li, L., Ming, W., & Lin, C. (2025). From teachers to influencers: Exploring edu-influencers' social media practices through uses and gratification theory. *System, 133*, Article 103774. https://doi.org/10.1016/j.system.2025.103774

Suryaputra, R., Daryanti, S. R. I., & Setyowardhani, H. (2024). The role of social media in promoting sustainable green lifestyles: Influencers and value co-creation with Gen Z in Indonesia. *Journal of Entrepreneurial Economics, 1*(1), 45-62. https://doi.org/10.61511/jane.v1i1.2024.1036

The Global Statistics. (2026). *Indonesia social media statistics 2026: Most popular platforms*. https://www.theglobalstatistics.com/indonesia-social-media-statistics/

Turner, J. R. (1993). Interpersonal and psychological predictors of parasocial interaction with different television performers. *Communication Quarterly, 41*(4), 443-453. https://doi.org/10.1080/01463379309369904

United Nations Environment Programme. (2024). *Global resources outlook 2024: Bend the trend—Pathways to a liveable planet as resource use spikes*. International Resource Panel. https://www.resourcepanel.org/reports/global-resources-outlook-2024

United Nations Environment Programme. (2025). *Facts about the nature crisis*. https://www.unep.org/facts-about-nature-crisis

Wahab, H. K. A., Alam, F., & Lahuerta-Otero, E. (2025). Social media stars: How influencers shape consumers' behavior on Instagram. *Spanish Journal of Marketing—ESIC, 29*(2), 188-206. https://doi.org/10.1108/SJME-09-2023-0257

WALHI. (2021). *Kondisi lingkungan hidup di Indonesia di tengah isu pemanasan global*. https://www.walhi.or.id/kondisi-lingkungan-hidup-di-indonesia-di-tengah-isu-pemanasan-global

Wang, J., & Oh, J. I. (2023). Factors influencing consumers' continuous purchase intentions on TikTok: An examination from the uses and gratifications (U&G) theory perspective. *Sustainability, 15*(13), Article 10028. https://doi.org/10.3390/su151310028

Whiting, A., & Williams, D. (2013). Why people use social media: A uses and gratifications approach. *Qualitative Market Research: An International Journal, 16*(4), 362-369. https://doi.org/10.1108/QMR-06-2013-0041

Xu, Y., Vanden Abeele, M., Hou, M., & Antheunis, M. (2023). Do parasocial relationships with micro- and mainstream celebrities differ? An empirical study testing four attributes of the parasocial relationship. *Celebrity Studies, 14*(3), 366-386. https://doi.org/10.1080/19392397.2021.2006730

Xu, Z., Islam, T., Liang, X., Akhtar, N., & Shahzad, M. (2021). "I'm like you, and I like what you like": Sustainable food purchase influenced by vloggers: A moderated serial-mediation model. *Journal of Retailing and Consumer Services, 63*, Article 102737. https://doi.org/10.1016/j.jretconser.2021.102737

Yang, Y., & Ha, L. (2021). Why people use TikTok (Douyin) and how their purchase intentions are affected by social media influencers in China: A uses and gratifications and parasocial relationship perspective. *Journal of Interactive Advertising, 21*(3), 297-305. https://doi.org/10.1080/15252019.2021.1995544

Yılmazdoğan, O. C., Doğan, R. Ş., & Altıntaş, E. (2021). The impact of the source credibility of Instagram influencers on travel intention: The mediating role of parasocial interaction. *Journal of Vacation Marketing, 27*(3), 299-313. https://doi.org/10.1177/1356766721995973

Yousaf, S. (2022). Food vloggers and parasocial interactions: A comparative study of local and foreign food vlogs using the S-O-R paradigm. *International Journal of Contemporary Hospitality Management, 34*(9), 3525-3549. https://doi.org/10.1108/IJCHM-09-2021-1090

Zafina, N., & Sinha, A. (2024). Celebrity-fan relationship: Studying Taylor Swift and Indonesian Swifties' parasocial relationships on social media. *Media Asia, 51*(4), 533-547. https://doi.org/10.1080/01296612.2024.2304422

Zhang, K., Zhang, M., & Li, C. (2021). Effects of celebrity characteristics, perceived homophily, and reverence on consumer-celebrity parasocial interaction and brand attitude. *Frontiers in Psychology, 12*, Article 711454. https://doi.org/10.3389/fpsyg.2021.711454

Zhao, C., Shen, H., & Zhang, Y. (2022). The study on the impact of short video tourism vloggers at social media platform on online sharing intention. *Frontiers in Psychology, 13*, Article 905002. https://doi.org/10.3389/fpsyg.2022.905002

Zubaidi, Z. (2025). *Sampah TPA Winongo menggunung, ini solusi wali kota Madiun*. Jatimnow.com. https://jatimnow.com/baca-76536-sampah-tpa-winongo-menggunung-ini-solusi-wali-kota-madiun

APPENDIX. SEMI-STRUCTURED INTERVIEW GUIDE

Introduction

Thank you for participating in this interview. This study aims to explore followers' motivation to develop parasocial relationships with sustainability micro-influencers and the implications of the relationships on sustainability context.

A. Following the Influencer

How did you first discover this sustainability influencer?

What made you decide to follow them?

B. Motivations for Developing Parasocial Relationships

What makes you continue following this influencer?

What do you like most about this influencer?

How do you feel about the way the influencer communicates sustainability issues?

Do you feel that the influencer shares values or perspectives similar to your own?

How relevant or relatable are the influencer's sustainability practices to your everyday life?

Have there been any particular posts, stories, or experiences that made you feel closer to the influencer? Please describe.

Why do you think you feel connected to this influencer?

C. Implications of the Relationships

Has following this influencer influenced the way you think about sustainability? How?

Has the influencer affected any of your attitudes, habits, or daily practices? Can you give examples?

Do you feel emotionally supported, inspired, or encouraged by the influencer? Why?

Do you feel part of a community of followers around this influencer? Please explain.

D. Closing

Is there anything else you would like to share about your experience following this influencer?

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A Study of the Construction of Lily's Cultural Identity in Timothy Mo's *Sour Sweet*

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ABSTRACT

Existing studies of Timothy Mo's *Sour Sweet* have largely examined Chinese diasporic experience, cultural conflict, and Confucian culture, while paying less attention to Lily's construction of cultural identity as an individual diasporic subject. Focusing on Lily, this study employs close reading and textual analysis, drawing primarily on Stuart Hall's theory of cultural identity and using intersectionality as a complementary perspective. It examines how Lily's early family life and martial arts training shape her cultural identity, how migration and changing familial and economic roles affect her position in Britain, and how later family rupture complicates her attempts to reconstruct her cultural identity. The findings show that Lily's martial upbringing provides her with bodily strength and discipline while also subjecting her to paternal control, making her early cultural identity internally complex rather than culturally fixed. After migration, her increasing involvement in household finance and the family business gives her a greater role in family decision-making, while earlier familial values continue to shape her responses to new circumstances. Chen's disappearance disrupts the family structure within which this position has developed, yet Lily does not respond to this rupture passively. Through memory, family responsibility, and her changing relationship with Man Kee, she continues to reposition herself and gradually reaches a new equilibrium, although this reconstruction remains limited. Her cultural identity is continually reconstructed through her responses to changing familial, economic, gendered, and diasporic conditions.

Keywords: Cultural identity, *Sour Sweet*, Stuart Hall, Timothy Mo

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INTRODUCTION

Chinese settlement in Britain had a long history, but a particularly important change occurred in the 1950s and 1960s, when large numbers of migrants from Hong Kong's New Territories arrived in Britain. Benton and Gomez (2008) note that this arrival transformed the existing Chinese communities, which had previously been relatively small and centred largely on port cities. Unlike many earlier Chinese settlers, who had entered Britain through maritime employment, post-war migrants from Hong Kong increasingly built their lives around land-based occupations and family networks. Their arrival represented a new stage in the formation of the British Chinese community.

The expansion of Chinese migration during this period was closely connected with changes in Britain's post-war economy. Commercial catering grew rapidly in the 1950s, as rising household incomes, the end of food rationing, and changing consumer tastes encouraged people to eat out more frequently. The arrival of Chinese from Hong Kong in Britain "coincided with the start of a Chinese catering boom, as a result of a general boom in commercial catering and the British discovery of a taste for the exotic" (Benton & Gomez, 2008). Many initially worked in established Chinese restaurants before setting up their own businesses, frequently drawing on kinship or village connections to recruit workers and support further migration. "The Commonwealth Immigration Act of 1962 temporarily strengthened these chains by introducing a voucher system that made new immigrants dependent on the patronage of established immigrants" (Benton & Gomez, 2008), reinforcing the concentration of Chinese migrants in the catering sector.

The changing composition and expansion of Chinese communities in Britain also provided an important social context for the development of British Chinese literature. According to Xiao (2020), although Chinese writing in Britain can date back to the early twentieth century, it has remained relatively marginal within the British literary sphere. Its development became more notable in the 1980s and 1990s, with the establishment of British Chinese Writers Association and British Chinese Artists' Association (Xiao, 2020). Timothy Mo was among the most prominent in this period, and his works have been listed in *The Cambridge Guide to Literature in English* (Xiao, 2020). British Chinese literature is also characterised by the heterogeneous backgrounds of its writers. Despite their different geographical and migratory experiences, such writers often engage with "Chineseness—whether through language, heritage, or cultural memory" (Xiao, 2025). At the same time, their different geographical and historical affiliations resist an understanding of British Chinese literature as a single or static category, instead contributing to its "dynamic, evolving and plural character" (Xiao, 2025).

Within this broader social and literary context, *Sour Sweet* (1982), a novel by Timothy Mo, turns to the everyday life of

a Hong Kong Chinese immigrant family in Britain. Shortlisted for the Booker Prize, the novel centres on the Chens, whose experiences unfold through their work, family relationships, and encounters with a new social environment. The Chens' livelihood is closely connected with the catering trade. Chen initially works as a chef in a Chinatown restaurant, and the family later open a takeaway in a London suburb. This trajectory shows a broader pattern of post-war Chinese settlement in Britain described by Benton and Gomez, in which catering employed many migrants from Hong Kong, some of whom later established their own restaurants and takeaways. As a wife, mother, and immigrant, Lily is central to the family, and her position within it is gradually reshaped by the changing economic and social circumstances. Although she continues to fulfil her female responsibilities within the new household, she also takes an increasingly active role in family decisions and in managing their new life. Lily's changing position makes her relevant to an examination of how cultural identity is continually negotiated and reconstructed within shifting familial and social conditions.

Existing studies have approached the novel from a variety of perspectives, including the representations of Confucian culture, Chinatown, the Hung Sect, family relations, and collective Chinese identity. These studies have provided important insights into this novel, but less attention has been paid to how Lily's cultural identity develops over the course of the novel. In particular, the connections between her early martial arts training, her changing position within the family, and the social conditions she encounters after migration have not been fully examined.

To address this gap, this study focuses on the construction of Lily's cultural identity in *Sour Sweet*. It traces how her early family experiences and martial arts training shape her cultural identity, how migration and changing familial and economic roles reposition her in Britain, and how later family rupture leads to further identity reconstruction. Particular attention is paid to the roles of gender, family relationships, and economic circumstances in this process. By considering Lily's individual experiences in relation to the historical and social context of British Chinese migration, this study moves beyond readings centred primarily on Confucian culture or generalised diasporic experience. It highlights the complex relationship between Lily's personal choices and the familial and social conditions that shape her cultural identity.

LITERATURE REVIEW

Sour Sweet portrays the struggles and hardships of first-generation Chinese immigrants in British Chinatown and is regarded as a representative work in British Chinese literature. Scholars have interpreted it through writing techniques, thematic analysis, language features, cultural study, and so forth. In terms of cultural elements in this novel, Rothfork (1989) and Tao (2012) study how Confucianism is manifested in the text, paying special attention to the portrayal

of the *hsiao*, or filial deference. Lim (1996) examines how patriarchal structures are deconstructed within traditional Confucian culture in the immigrant Chinese family. Ho (2000) further adopts a defamiliarisation approach to analyse the family and social spaces in the British Chinatown in the novel, revealing how cross-cultural context reshapes the power order of the immigrant family. Jin (2026) analyses the Chinese Pidgin English used by the non-whites in this novel.

Another group of studies focuses on immigrant individuals and their adaptive experiences in the novel. Suprajitno (2002) discusses how different personal traits influence the major characters' attitudes and coping strategies when they face an unfamiliar Western social and cultural environment. Çelikel (2010) points out that food and the body mark immigrant identity and serve as important channels for cultural exchange, cultural translation, and cultural transformation in *Sour Sweet*. In a more recent study, Zhai and Wang (2025) offer a detailed study of the relation between thing narrative and immigrants' cross-cultural adaptation.

While previous research offers valuable insight into this novel, it still has noticeable limitations, creating gaps worthy of further exploration. First, most studies rely on conventional ethnic literary frameworks to describe immigrant Chinese or Confucian culture in the text, with limited close reading of how diasporic Chinese negotiate and reconstruct their cultural identities in the British context. Second, previous studies tend to prioritise collective experiences of diasporic Chinese in Britain while neglecting individual differences in their cultural identity construction. Although existing studies have examined manifestations of the protagonists' identity crises, particularly their cross-cultural conflicts, less attention has been paid to how their cultural identities are initially formed and subsequently develop. Accordingly, the underlying cultural driving forces and the dynamic process of identity construction remain underexamined. These gaps leave space for further in-depth textual analysis of this novel.

Due to these limitations, this study examines the dynamic process of Lily's cultural identity formation mainly through Stuart Hall's theory of cultural identity. Hall argues that cultural identity is "a matter of 'becoming' as well as of 'being'" and is "subject to the continuous 'play' of history, culture and power" (Hall, 1990). His distinction between "similarity and continuity" and "difference and rupture" further shows how identity is shaped through both connections with the past and subsequent breaks and differences. Intersectionality offers a complementary perspective on how Lily's gender, migration, familial roles, and economic position interact at different stages of her identity construction. In this way, the study provides a closer examination of Lily's changing cultural identity within the specific familial and diasporic conditions represented in *Sour Sweet*.

Theoretical Framework

Hall puts forward two perspectives on cultural identity first in *Cultural Identity and Cinematic Representation* (1989). It was later revised as *Cultural Identity and Diaspora* (1990), becoming one of the most highly cited works in cultural studies. Hall first distinguishes a position that understands cultural identity in terms of continuity and shared experience. From this perspective, cultural identity reflects "the common historical experiences and shared cultural codes which provide us, as 'one people', with stable, unchanging and continuous frames of reference and meaning" (Hall, 1990). Meanwhile, Hall's second position brings historical difference, transformation, and rupture into the understanding of cultural identity. He argues that identities have histories, but they are also subject to continuing transformation. Rather than being fixed in an essentialised past, an identity "belongs to the future as much as to the past". They are formed by how individuals are positioned within changing historical and cultural circumstances.

The emphasis on difference also leads to Hall's discussion of rupture. In his account, Hall (1990) describes how the ruptures and discontinuities constitute precisely the Caribbean's uniqueness. Rupture does not simply mean the loss of an original identity. Rather, it points to the historical breaks and differences that prevent cultural identity from remaining continuous and unchanged. Experiences such as displacement, migration, and changing social relations may alter the positions from which individuals understand their past and locate themselves in the present. Continuity and rupture are not mutually exclusive. A sense of connection with the past may persist even as new circumstances disturb earlier forms of identification and produce new differences. Cultural identity develops through this tension between what is retained and what is changed.

Hall (1996) further develops his understanding of identity in *Who Needs "Identity"?* by arguing that identity should be understood as "a strategic and positional one" (Hall, 1996). Here, identity takes shape through particular positions and is articulated within specific historical and discursive conditions. Hall also stresses that identities are "never singular but multiply constructed across different, often intersecting and antagonistic, discourses, practices and positions" (Hall, 1996). This formulation further complicates any attempt to understand diasporic identity through a single cultural origin. Historical and cultural attachments remain important, but their meanings may change as subjects occupy different social positions and encounter different discourses and relations of power. Identity, in this sense, involves "using the resources of history, language and culture in the process of becoming rather than being" (Hall, 1996).

Hall's emphasis on difference and positioning remains useful for understanding cultural identity, and later scholarship has highlighted the multiple social positions through which identity is formed. Crenshaw's concept of intersectionality

challenges approaches that treat race and gender as mutually exclusive categories of experience and analysis (Crenshaw, 1989), drawing attention to the ways different forms of social difference and inequality intersect. Later scholars further develop intersectionality into a broader theoretical and methodological field, shifting attention from identity categories themselves to the social dynamics and relations through which subjects are constituted (Cho et al, 2013). Such perspectives complement Hall's theory of cultural identity by highlighting how gender, ethnicity, economic position, and migrant status may interact under particular social conditions.

Altogether, these perspectives provide a framework for examining the construction of cultural identity. Based on this, the study examines how Lily's early family experience and martial arts training shape her cultural identity, how migration and changing economic and familial roles affect her position in Britain, and how family rupture challenges her previous sense of identity and leads to further reconstruction.

METHODS

This study uses close reading and textual analysis as its core methods. It employs Hall's cultural identity theory as the primary framework to examine the construction of Lily's cultural identity in *Sour Sweet*. Following Hall's interpretation of cultural identity, this study considers identity in relation to historical continuity, difference, positioning and rupture. An intersectional perspective is also used as a supplementary approach to examine how gender, family roles, economic position, and migration interact in Lily's identity construction.

Hall's theory of cultural identity provides the main theoretical basis for the textual analysis. While the first position draws attention to shared histories and cultural continuity, the second emphasises difference, transformation, positioning, and rupture. Close reading is used to trace these processes through Lily's actions, interactions with other characters, and significant experiences in the novel. Particular attention is given to Lily's early family experience and martial arts training, her changing familial and economic position after migration to Britain, and the later rupture of her cultural identity. The analysis considers how she responds to changing social and familial circumstances and how intersecting conditions shape her possibilities for action.

First, in terms of the historical formation of identity, close reading examines how Lily's early family experience and martial arts training provide important resources for her cultural identity. In this sense, cultural tradition can provide a point of identification for her, but its meaning remains subject to reinterpretation as her circumstances change.

Second, in terms of identity positioning after migration, this study draws on Hall's theory to examine how Lily responds to the changing social, familial, and economic conditions of migrant life in Britain. Particular attention is paid to how she draws on existing cultural resources while taking

on new roles in the family and its business. An intersectional perspective further helps to consider how gender, family roles, economic position, and migration interact in shaping Lily's cultural positioning.

Third, the study examines the later development of Lily's cultural identity as changes in her family relationships unsettle the position she has established in Britain. Close reading is used to analyse how she responds to Chen's disappearance and her changing relationship with Man Kee, and how these experiences alter her position within the family. Particular attention is paid to the new equilibrium Lily seeks to establish through memory and familial responsibility, as well as the possibilities and limits of her later cultural position.

This study follows a text-based approach. The analysis is grounded primarily in textual evidence from the novel and is supplemented by relevant historical and social contexts of Chinese migration to Britain. The analysis does not rely on Mo's biographical information to explain the character or the novel.

In conclusion, this study combines close reading and textual analysis with Hall's cultural identity theory, supplemented by an intersectional perspective. The analysis examines Lily's cultural identity through its early historical and familial formation, her changing position after migration, and the later processes of rupture and reconstruction. This approach allows the study to explore both Lily's responses to changing circumstances and the social, familial, and economic conditions that shape the possibilities and limits of her identity construction.

RESULTS AND DISCUSSION

Martial Arts, Family, and Lily's Early Cultural Identity

Sour Sweet depicts the diasporic experience of the Chens, a Hong Kong Chinese family consisting of Chen, his wife Lily, and her sister Mui, who settle in Britain in the mid-twentieth century. Lily's cultural identity, however, is formed by a particular familial and social history before migration. Her childhood martial arts training, upbringing, and experience of wartime displacement provide the early foundations for her cultural identity.

Born in rural Kwangsi, China, Lily grows up in a household without a male heir after her mother dies giving birth to Mui. Her father responds by deciding that he can "pretend Lily was a boy" (Mo, 1982). This decision places Lily in a different position than her elder sister. While Mui is associated with flower arrangement, embroidery, and other activities arranged for her as a girl, Lily is directed towards the "sterner pursuits" of martial training. The contrast between the sisters shows that her gender does not simply determine Lily's early identity position. Rather, it develops within the specific structure of her family and through her father's decision to assign her a role unavailable to her.

The particular form of martial arts Lily learns further reveals the gendered nature of her father's arrangement. The narrator makes this distinction explicit by contrasting

the martial arts chosen for Lily with the "soft" or "internal" styles usually associated with female practitioners:

> No "soft" or "internal" style for Lily, with the passive, yielding techniques girls usually studied. Lily was not to learn one of the suitable systems such as the eight-diagram palm, the supreme ultimate fist of tai chi. White Crane fighting, or the speedy, economical system invented by the Buddhist nun Yim Wing Chun in the late eighteenth century. Instead, she was to be versed in all the pristine rigour and southern form of siu lum temple boxing.
>
> (Mo, 1982)

The contrast between these different styles makes her father's choice significant. Rather than seeing Lily as a common female practitioner, he subjects her to a more rigorous form of training. His decision reflects not simply the transmission of martial tradition, but the distinctive role he assigns Lily within the family. At five, Lily is required to remain in a low crouch for an hour while balancing a wine jar on her head and enduring repeated blows to her shins. The image of her continuing the exercise in tears reveals the severity of the discipline imposed on her. Martial arts give Lily unusual bodily strength and discipline while also placing her body under strict paternal control. This combination of empowerment and discipline becomes an important part of her early cultural identity.

However, such upbringing does not give her a stable position within the family. The same paternal authority that makes her exceptional also sets clear limits on her position. When Lily reaches puberty, her father abruptly ends her martial training. Significantly, his decision does not arise from "any tardy recognition of his daughter's gender" but from his dissatisfaction with the changes in her martial movements (Mo, 1982). The training consequently ends "as arbitrarily as it had begun" (Mo, 1982), which reflects the father's control over Lily's position. He first allows her to cross the gender distinction established between the two sisters and then withdraws that exceptional role according to his own judgement.

Lily's family history is further disrupted by political upheaval and war. In the final stage of the Chinese Civil War in the 1940s, her father joins the retinue of a local landowner and is killed three months later while attacking fortified positions (Mo, 1982). The narrator places his death within a wider historical change, observing that boxers who had previously played an important role in the "patriotic rising of 1900" had by the middle of the century been "overtaken by an interpretation of history" (Mo, 1982). With the death of her father, the practice that had structured Lily's childhood is no longer transmitted through the immediate master-disciple and father-daughter relationship. Lily and Mui are subsequently left to make their way alone, turning the martial and familial world of Lily's childhood into part of a disrupted past.

Seen in relation to Hall's distinction between cultural continuity and rupture,

these experiences provide an important historical basis for Lily's early cultural identity. Her martial upbringing connects her to her father and family history, but this inheritance is formed by gendered difference, paternal authority, and historical disruption. Martial arts give Lily bodily discipline and a distinctive position within the family. Yet, the abrupt end of her training and the later loss of her father prevent this position from becoming stable. Thus, her early cultural identity is historically formed and internally complex rather than culturally fixed.

Migration and the Repositioning of Lily's Cultural Identity

After migrating to Britain, Lily has to adapt her earlier cultural practices and family values to a different social and economic environment. At the beginning of *Sour Sweet*, the Chens have lived in Britain for four years, long enough to have "lost their place in the society from which they have emigrated but not long enough to feel comfortable" in Britain (Mo, 1982). This leaves the family with an even more unstable sense of cultural belonging. For Lily, migration does not erase the familial practices and bodily knowledge formed during her childhood. She continues to draw on them in managing her domestic life, but their meanings are increasingly shaped by the circumstances of migrant life in Britain. Her cultural identity after migration develops through the interaction between inherited cultural resources and the new social positions available to her as a wife, mother, and member of a migrant household.

The new family's economic status also shapes Lily's position after migration. Chen works long hours in a Chinese restaurant, spending fifty-six hours a week at work and considerably less time with his wife and son. Although his wages are described as "spectacularly good", "the money came at a cost" (Mo, 1982). This working pattern reflects the economic circumstances of post-war Chinese migration to Britain. As Benton and Gomez (2008) propose, the expansion of Chinese catering in the post-war decades provided an important source of employment for migrants from Hong Kong, many of whom initially worked in the restaurants as cooks and waiters before seeking opportunities to branch out on their own For Lily, Chen's long working hours mean that relative economic security comes with greater responsibility for everyday family life. She manages the household largely in his absence and gradually assumes a more important role in family decisions. Chen's employment is significant to Lily's identity construction because the economic conditions of migrant life also reshape her position within the family.

Lily initially performs this domestic role through practices she understands as appropriate to family life. She prepares a snack for Chen when he returns after midnight and watches closely to ensure that he finishes it. The narrator connects her behaviour to knowledge inherited from her father, including ideas about bodily balance and yin and yang. These details show that Lily continues to rely on the cultural knowledge she acquired earlier. Yet she is

far from an obedient wife. Even apparently conventional acts of care contain an element of control, as Chen finds Lily's "reproachful eyes" sufficiently powerful and intolerable to make him finish food he does not want. Domestic responsibility gives Lily a sphere in which her inherited knowledge, care, and authority can overlap. Her later rise within the family does not emerge suddenly from cultural adaptation but develops from a domestic position she has occupied from the beginning.

Outside the household, however, Lily is less familiar with the rules and conventions of British society. This becomes clear after she begins learning to drive. Her confidence in driving is closely connected with what she has learned from her father. When Mui worries about her driving, Lily recalls a principle repeatedly taught to her in childhood: "It's not hurry which makes speed, elder sister, but coolness" (Mo, 1982). Yet Lily also assumes her ability to drive matters more than formal recognition. She has no intention of taking a driving test and tells Mui, "I shall put a little tea money in a plastic folder. That'll be my licence" (Mo, 1982). Mui immediately warns her that "You can't get away with that sort of thing here" (Mo, 1982) and reminds her of the possibility of fines or even imprisonment. The disagreement shows that Lily tends to handle unfamiliar situations through the experience and judgement she already possesses, rather than immediately accepting rules that are new to her. This tendency may also relate to the family outlook she formed during childhood. Her belief that family members should remain united against "a hostile conspiring world" suggests that she has learned to rely strongly on the family and its own ways of confronting external difficulties (Mo, 1982). Her loyalty to her father and her reluctance to follow British regulations are not necessarily contradictory. The former belongs to the familial authority and disciplines she has internalised since childhood. In contrast, the latter belongs to an unfamiliar social system whose rules she does not yet fully accept. Her earlier cultural experience still influences how she responds to life in Britain, but familiar ways of dealing with problems do not always fit the new social environment.

Chinatown provides a different kind of encounter because it brings Lily into contact with a cultural practice familiar from her earlier life. Watching a public Chinese boxing demonstration, she does not simply recall her past but evaluates what she sees through the martial knowledge acquired in childhood. She becomes critical of the performers' techniques, noting that "their balance was single-weighted on the leading foot, cardinal error which could lead to broken legs in combat; the shadow boxing sets left out moves, and so on" (Mo, 1982). Her judgement shows that martial arts remain part of the knowledge through which she understands what she encounters after migration. In this sense, her earlier cultural experience continues to shape her diasporic life, while taking on new significance in a different social setting. It reactivates the special knowledge acquired through childhood training and

allows her to judge the performers from the position of an experienced practitioner. The distinction between spectator and expert temporarily changes her position in the public space of Chinatown. Martial arts, which her father had imposed on her through paternal discipline, then becomes a resource through which she exercises judgement independently of her father. The episode shows that Lily's earlier cultural experience has not simply disappeared. She retains embodied knowledge from her past but uses it from a different social and historical position.

A more consequential change occurs when Lily begins to intervene directly in the family's economy. The Chens' decision to establish their own business needs to be read against the structure of Chinese catering in Britain. Benton and Gomez (2008) note that independent proprietorship became an important aspiration among Chinese catering workers, and that personal savings and family labour played a major role in making such businesses possible (pp. 123-124). The novel also places the Chens directly within this pattern. Long before the family faces the risks of running its own establishment, Lily has been "scrimping on her diet" and steadily accumulating capital from the household budget (Mo, 1982). Her saving is not simply an act of thrift, but an effort to "insure against disaster or make a new future" (Mo, 1982). By carefully managing the household budget and accumulating savings, Lily gradually takes on a greater role in the family's financial affairs. Her contribution also strengthens her position in family decisions as the Chens move towards establishing their own business.

The move into family business also complicates the gendered division that had characterised the household. Benton and Gomez (2008) show that family labour gave Chinese takeaway businesses important economic advantages, and that husband-and-wife teams initially established many takeaways after working together and accumulating savings. From an intersectional perspective, Lily's growing economic role is closely connected to her position as a wife, mother, and member of the diaspora, as her involvement in the family business develops alongside her responsibilities within the household. Similar economic pressures shape the Chens' experience. When they inspect possible premises, Chen initially wants "a more cautious, less obtrusive start", whereas Lily is less willing to retreat from the risks involved (Mo, 1982). Chen's exposure to British society through restaurant work has made him acutely conscious of hostility outside the household. Lily, by contrast, has had less direct exposure to such encounters and approaches the new business with a different perception of risk. Their disagreement reflects more than a contrast between a cautious husband and a more assertive wife. Their different experiences of work and public life in Britain shape how they understand the risks involved in starting their business.

As the business develops, Lily becomes increasingly involved in the family's economic affairs. Her savings, labour, and

involvement in financial decisions give her a more direct stake in the household economy. At the same time, the business depends heavily on family cooperation. Her growing authority reflects both her commitment to the family and her increasing role in family decisions. Her efforts focus on the family's economic well-being, which also strengthens her voice in decisions conventionally associated with Chen as husband and breadwinner.

The dispute over remittances further reveals that Lily's economic authority is tied to her understanding of family obligation. When Chen proposes temporarily stopping payments to his parents, Lily regards the suggestion as a violation of "everything she believed in" and insists that the money should continue even if the family itself has to endure hardship (Mo, 1982). When Chen asks "Who is head in our family? You think wife tells Husband what to do?", Lily lowers her eyes but remains determined to disobey him. The scene makes the redistribution of domestic power explicit. Lily does not directly challenge Chen but does so in defence of a familial obligation she considers necessary to fulfil. Her insistence on family obligation does not make her submissive but gives her a reason to challenge his decision. The same commitment to family responsibility that might appear conservative gives Lily grounds to contest her husband's decision.

Lily's increasing involvement in managing family finances and running the family business give her greater influence over important family decisions. At the same time, she continues to draw on the familial values formed through her earlier experiences, as shown by her insistence on sending money to Chen's parents. These earlier values take on a different significance as Lily assumes greater economic and familial responsibilities in Britain. Her cultural identity is repositioned through her changing role within the family and the new economic circumstances of migrant life. This process reflects Hall's understanding of cultural identity as continually positioned and repositioned within changing historical conditions.

Yet Lily's cultural identity is repositioned more within the family and its economic life, and does not extend to the wider social sphere. The family business gives her greater influence over financial and domestic decisions, but her social contacts remain limited. Chen's work and concealed involvement with the Triad expose him to relationships and dangers of which Lily hardly knows. The limits of Lily's position become increasingly visible as tensions within the family intensify, and its previous stability begins to break down.

Family Rupture and Lily's Cultural Identity Crisis

The family occupies a particularly important place in Lily's life after migration. The novel describes her as moving within a "restricted circle" consisting largely of herself, Mui, and Man Kee. At the same time, her English neighbours and the Polish doctor remain little more than acquaintances (Mo, 1982). With much of her everyday life centred on

this small circle, the relationships within it become closely connected with the position Lily establishes in Britain. As tensions gradually emerge among Lily, Chen, Mui, and Man Kee, the family can no longer provide the same sense of order and stability. These changes prepare the way for a more serious crisis in Lily's cultural identity.

After several disagreements over Man Kee and Mui, Lily begins to feel that the other family members are turning against her. This sense of isolation is clearly shown in the dinner-table scene. When Chen takes Lily's usual chair, she finds herself "ranged on her own at the table", while Chen, Mui, and Man Kee sit together opposite her. The arrangement "mirrored the rift of feeling in the family" (Mo, 1982). The scene makes Lily's growing isolation within the family visible. Although she has gained a stronger voice in family decisions, her relationships with other family members have become increasingly strained. Her stronger position within the household does not necessarily bring greater understanding or closeness among members.

Her conflict with Man Kee exposes this limit more sharply. When her son says that he wants to become a gardener, Lily immediately asks whether he wants to become "a coolie" and reminds him of the labour and educational investment the family has made on his behalf (Mo, 1982). Her anger reflects her economic aspirations as a first-generation migrant parent who sees education as a means of securing upward mobility for the next generation. Yet Lily converts this aspiration into parental authority, insisting that Man Kee "must do what his parent says" (Mo, 1982). The disagreement reveals a growing conflict between Lily's expectations for her son's future and Man Kee's desire to make his own choices.

Lily's response to this disagreement turns the conflict over Man Kee's future into a physical struggle. According to the text, Lily goes into the garden, grips the mango plant, and tries to pull it from the ground. "She strained, fighting the plant with her whole body. With louder vegetable groanings, it began to come out of the earth. Another long pull and then the plant was uprooted with a single loud snap that seems to come out of her own body" (Mo, 1982). The scene recalls the bodily force developed through Lily's martial arts training, but it is then directed toward something cultivated by her son. The mango plant has grown successfully in a new environment Lily had considered unsuitable. Its unexpected growth parallels Man Kee's increasing independence and his desire to make choices beyond Lily's expectations. By uprooting the plant, Lily attempts to resist a change within the family that she finds difficult to accept.

Yet the final "snap", which comes from her own body, also connects the destruction of the plant with her own emotional strain. The episode reveals a growing tension in Lily's cultural identity. The martial strength and familial authority that have helped her establish her position within the family can no longer secure the same authority over Man Kee. Her position as a mother

then conflicts with her established role as the family's decision-maker. From an intersectional perspective, these positions do not operate separately but converge in her response to Man Kee, making his growing independence both a familial challenge and a challenge to the position Lily have constructed after migration. As Zhai and Wang propose, things (including the mango) serve as repositories of deep psychological truths, amplifying character traits and acting as powerful catalysts that propel the tragic figures toward their inevitable downfalls (Zhai & Wang, 2025).

Chen's subsequent disappearance turns these family tensions into a deeper rupture. His absence confronts Lily with a situation she cannot manage through the familial authority she has established. More importantly, the family structure on which her position in Britain has depended is suddenly disrupted. Although Lily has often challenged Chen and taken a leading role in family decisions, her roles as wife, mother, and manager of the household have all developed within their relationship. His disappearance affects more than her personal life. It further unsettles the familial position through which much of her cultural identity has been formed after migration.

This moment reflects Hall's distinction between "similarity and continuity" and "difference and rupture" (Hall, 1990). The rupture does not erase Lily's earlier identity but changes the conditions under which she can maintain it. Without Chen, the family relationships and roles that previously supported her position can no longer function in the same way. Lily must reposition herself within a changed family structure, while Man Kee's growing independence further complicates the process.

Lily does not respond to Chen's disappearance passively. She searches for him and tries to find out what has happened, but much of his life outside the family remains unknown to her. This situation marks a clear departure from the pattern established earlier in the novel. Within the family, Lily has usually responded to difficulties through her own decisions and actions. Chen's disappearance, however, confronts her with a situation that she can neither control nor resolve. How she has previously maintained family order is no longer sufficient, leaving the position she has established in Britain increasingly unstable.

The family rupture reveals the limits of the position Lily has constructed after migration. Her martial arts training, domestic authority, financial management, and commitment to family obligation have helped her establish a position within the household. Still, they cannot protect that position from changes in family relationships. Her conflict with Man Kee shows that she cannot simply pass her values and expectations on to the next generation. At the same time, Chen's disappearance demonstrates that authority within the family does not give her control over the circumstances beyond it. Lily's identity crisis emerges as the relationships that have supported her position begin to change or

disappear. From Hall's perspective, rupture does not erase her earlier cultural identity, but requires Lily to reposition herself when the values, relationships, and roles that previously supported it can no longer function in the same way.

The Limits of Lily's Cultural Identity Reconstruction

Chen's disappearance does not bring Lily's identity construction to an end but changes the conditions under which she continues to reposition herself. In Britain, Lily must continue the business and everyday family life without the relationship that had previously shaped her position within the household. She cannot simply recover her earlier position but must respond to these changes. Her subsequent reconstruction reflects the continuing process of becoming described by Hall, while also revealing the difficulties of repositioning herself after the family rupture.

One of Lily's responses is to reconstruct Chen through memory and imagination. During his lifetime, their relationship is marked by disagreements and repeated conflicts over family decisions. After his disappearance, however, these tensions fade when Lily talks about Chen to Man Kee. In her memory and imagination, Chen becomes "far-sighted, strong, resolute, kind, magnanimous, and brave; he was also considerate, unselfish, sympathetic, tender, and gentle" (Mo, 1982). This idealised image differs noticeably from the Chen presented earlier in their married life and allows Lily to preserve a positive image of the absent father for Man Kee.

Lily is not simply recalling the past as it was but reshaping her memories in response to the family's changed circumstances. As Man Kee grows up without his father, this idealised image of Chen helps her maintain a sense of family connection after the earlier family structure has broken down. At the same time, this reconstruction shows how Lily attempts to reposition herself after the rupture by giving new meaning to a relationship that can no longer continue in its previous form.

However, the limits of this reconstruction also become clearer when Lily's different social positions are considered together. Chen's absence affects not only her position as a wife but also the familial and economic responsibilities she must then assume. As subjects are constituted through intersecting social dynamics and relations (Cho et al., 2013), Lily's identity reconstruction must be understood in relation to her position as a mother, the family's sole supporter, and a Chinese immigrant in Britain. These overlapping positions increase her responsibilities while limiting her options for rebuilding her life after Chen's death.

Man Kee further complicates Lily's identity reconstruction after Chen's disappearance. As a second-generation Chinese who grows up in Britain, he develops preferences and expectations that do not always correspond with Lily's own. Lily nevertheless continues to fulfil her maternal responsibilities and passes on to him the family memories she has reconstructed after Chen's disappearance. In this sense, her role as a mother helps her

maintain family ties and cultural memory under changed circumstances. Her continued love for Chen, her belief that he may one day return, and her insistence on sending money to his parents back in Hong Kong further show that she does not abandon the relationship after his disappearance. By presenting a more positive image of Chen to Man Kee, Lily gives the absent husband and father a new place within the changed family.

Man Kee's growing independence places limits on Lily's reconstruction of her cultural identity, as she can no longer organise family life entirely according to her own expectations. Yet this does not diminish the active role she has come to play within the family. After Chen's disappearance, Lily continues to raise her son, manage family responsibilities, and maintain the values and memories she considers important. At the same time, she gradually accepts that Man Kee may make choices different from her own. Lily's later cultural identity represents neither a return to her earlier position nor a collapse after rupture. Instead, she begins to "find the still point of equilibrium" (Mo, 1982) between her attachment to the past and the changing realities of her family life. This equilibrium remains open to further change, showing that Lily can reposition herself through loss, motherhood, and ongoing family responsibility rather than being passively defined by them.

Taken as a whole, Lily's reconstruction after family rupture is neither a return to her earlier identity nor a passive response to the loss of Chen. Through her idealisation of Chen, her continuing commitment to family responsibilities, and her changing relationship with Man Kee, she actively repositions herself within the altered family structure. From an intersectional perspective, her positions as a mother, family organiser, financial decision-maker, and Chinese immigrant interact in this process, shaping both the possibilities and limits of her reconstruction. Lily gradually reaches a new equilibrium between her attachment to the past and the realities of her changed family life. Yet this equilibrium remains limited, as she cannot restore the relationships that have been lost or determine how Man Kee, as a second-generation Chinese person growing up in Britain, will understand the family history and values she passes on. Despite these limitations, Lily's reconstruction shows that rupture does not end her cultural identity formation, but may open new possibilities for her to reposition herself under changed circumstances.

CONCLUSION

Drawing on Stuart Hall's theory of cultural identity and supplemented by an intersectional perspective, this study examines Lily's cultural identity construction in *Sour Sweet* through close reading and textual analysis. The analysis shows that her cultural identity is shaped by both historical continuity and changing familial and social conditions. Her early martial arts training remains an important part of her cultural experience, while migration, changing family relations, and increasing economic responsibilities alter

the meanings attached to that experience. Lily's cultural identity construction is not a passive cultural adaptation. Instead, it develops through continuous repositioning between inherited values, changing social positions, and moments of rupture.

The study shows that Lily's cultural identity is better understood by bringing cultural continuity, gender, family roles, economic responsibilities, and immigrant experience into the same analysis. Hall's theory helps explain the changing and positional nature of her cultural identity, while an intersectional perspective shows how gender, family roles, economic position, and immigrant status shape both her choices and the constraints she faces. This reading also moves beyond approaches that treat Lily mainly as a representative of Chinese tradition and draws attention to how her identity develops through specific experiences and changing relationships. In this sense, the study offers a more character-centred understanding of identity construction in *Sour Sweet* and contributes to discussions of British Chinese diasporic literature.

This study focuses primarily on Lily and does not provide an equally detailed analysis of other characters whose experiences also contribute to the novel's representation of cultural identity. Its focus on a single character in a single text also limits the extent to which its findings can be applied to Mo's novels more broadly. Future research could compare Lily with other female characters in Mo's other novels to examine how different familial, social, and migratory circumstances shape cultural identity in different ways. Such comparative work may provide a broader understanding of the varied forms of identity construction represented in Mo's novels.

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REFERENCES

Benton, G., & Gomez, E. T. (2008). *The Chinese in Britain, 1800-present: Economy, transnationalism, identity*. Palgrave Macmillan. https://doi.org/10.1057/9780230288508

Çelikel, M. A. (2010). Food and body as markers of identity in Timothy Mo's *Sour Sweet*. *Seria Filologie, 62*(3), 228-232.

Cho, S., Crenshaw, K. W., & McCall, L. (2013). Toward a field of intersectionality studies: Theory, applications, and praxis. *Signs: Journal of Women in Culture and Society, 38*(4), 785-810. https://doi.org/10.1086/669608

Crenshaw, K. (1989). Demarginalizing the intersection of race and sex: A Black feminist critique of antidiscrimination doctrine, feminist theory and antiracist politics. *University of Chicago Legal Forum, 1989*(1), 139-167.

Hall, S. (1989). Cultural identity and cinematic representation. *Framework: The Journal of Cinema and Media*, (36), 68-81.

Hall, S. (1990). Cultural identity and diaspora. In J. Rutherford (Ed.), *Identity: Community, culture, difference* (pp. 222-237). Lawrence & Wishart.

Hall, S., & du Gay, P. (Eds.). (1996). *Questions of cultural identity*. SAGE Publications.

Ho, E. Y. L. (2000). *Timothy Mo*. Manchester University Press.

Jin, Y. (2026). From postcolonialism to cosmopolitanism: Reading Timothy Mo's thematic shift and its resonance with the development of British Chinese literature. *English Studies, 107*(3), 419-436. https://doi.org/10.1080/0013838X.2025.2573716

Lim, S. G. L. (1996). Race, national identity, and the subject in the novels of Timothy Mo. In P. Stummer & C. Balme (Eds.), *Fusion of cultures?* (pp. 91-101). Rodopi.

Mo, T. (1982). *Sour Sweet*. André Deutsch.

Rothfork, J. (1989). Confucianism in Timothy Mo's *Sour Sweet*. *The Journal of Commonwealth Literature, 24*(1), 49-64. https://doi.org/10.1177/002198948902400106

Suprajitno, S. (2002). Between two worlds: Timothy Mo's *Sour Sweet*. *k@ta, 4*(2), 75-90. https://doi.org/10.9744/kata.4.2.75-90

Tao, J. J. (2012). Chinese diaspora's Confucian "family" identity in Timothy Mo's *Sour Sweet*. *Contemporary Foreign Literature*, (1), 119-126. https://doi.org/10.16077/j.cnki.issn1001-1757.2012.01.007

Wang, G. L. (2010). Breaking out of the binary opposition cage: On Mo's novel *Sour Sweet*. *English and American Literature Studies*, (1), 112-116.

Xiao, C. D. (2025). Impacts of empire: British Chinese writers and their writing codes. *Literature Compass, 22*(3), Article e70029. https://doi.org/10.1111/lic3.70029

Xiao, C. D. (2020). *The politics of survival: Narrating histories in British Chinese literature*. Foreign Language Teaching and Research Press.

Zhai, W. H., & Wang, T. H. (2025). Tragic fates and ontological suspense: Thing narrative in Timothy Mo's *Sour Sweet*. *Critique: Studies in Contemporary Fiction*. Advance online publication. https://doi.org/10.1080/00111619.2025.2566240

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Intersectionality and Narrative Form: Race and Power in Zadie Smith's *On Beauty*

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ABSTRACT

This study investigates the relationship between intersectionality and narrative structure in Zadie Smith's (2005) novel *On Beauty* and how race and power are represented. Although previous literature has touched upon various themes, such as cosmopolitanism, liberalism, and diasporic identity within the novel, there is little focus on how intersectionality is applied in the novel as a cohesive analytical approach. To fill this gap, the current research relies on the theory of intersectionality developed by Kimberlé Crenshaw (1989) and the concept of the matrix of domination developed by Patricia Hill Collins (1990) to examine four interconnected dimensions: Racial Oppression, interlocking oppression, double bind, and intersectional invisibility. This study explores the functioning of these concepts at both the thematic and formal levels of the novel through a close textual analysis. It claims that the contradictions of race and power are actively created by the irony, free indirect discourse, and narrative ambivalence used by Smith and not merely represented. This analysis shows that the reproduction of systems of racial and gendered inequality is carried out at the institutional, social, and intimate levels, which involves both privileged and marginalised characters in the same system of domination. This study contributes to the scholarship on literature and culture by pre-emptively indicating the importance of narrative form in the formation of intersectional experience in a more conceptually rigorous and formally sensitive approach to the study of *On Beauty*. It also emphasises the significance of infusing theoretical accuracy with close reading in interpreting race in modern fiction.

Keywords: Intersectionality, narrative form, oppression, race, Zadie Smith

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INTRODUCTION

This study claims that Zadie Smith's *On Beauty* (2005) is not a race novel in

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liberal academic circles, but a literary enquiry that persists over time on how interrelated systems of oppression are both marginalising, invisible, and silencing Black subjects, specifically Black women. Inspired by Kimberlé Crenshaw's (1989) theorisation of intersectionality and Patricia Hill Collins's (1990) concept of the matrix of domination, we argue that the narrative form employed by Smith-its irony, dialogism, and use of free indirect discourse–actively brings about the ambivalences and contradictions which intersectional theory aims to name. Instead of providing direct critiques of how racism is perpetuated, Smith directs all her characters, including the Black conservative Monty Kipps and the liberal white academic Howard Belsey, to reproduce racial and gender hierarchies. The present reading addresses a particular gap in the current scholarship: whereas the ideas of cosmopolitanism, liberalism, and diasporic femininity in the novel have been studied by a variety of critics, such as Batra (2010), Taheri (2017), and Siccardi (2020), no one has presented the four interconnecting notions of intersectionality, matrix of domination, double bind, and intersection invisibility as a unified critical framework for the text.

Race, identity, ethnicity, equal rights, oppression, and stereotypes remain subjects of urgent debate in contemporary society. Race is a historically dominant social construct. The term 'racism' was coined in the 1930s as a reaction to the Nazi project aimed at making Germany *judenrein*, or free of Jews (Rattansi, 2020). The term's meaning is complex, encompassing various cognate ideologies such as ethnocentrism, nationalism, and xenophobia. In the nineteenth century, Robert Knox published *The Races of Men* (1850), asserting that race was the key concept for understanding human variation, while the French count Arthur de Gobineau regarded the history of every social order as the result of conquest by a dominant race, producing a bourgeois class of mixed origins and a lower class formed through miscegenation (Rattansi, 2020).In the United States, it is estimated that Europeans or whites are the ancestors of more than three-quarters of the African American population. During the era of slavery, white plantation owners exploited enslaved Black women, asserting their sexual rights over them. The uncertain status of mixed-race children gave rise to racial classifications such as 'Sambo' and 'meamelou,' associated with the principle of hypodescent, whereby children of mixed unions are automatically assigned to the group with a lower social status—an ideology also known as invisible blackness.

Stokely Carmichael and Charles Hamilton popularised the concept of institutional racism in the 1960s in the United States (Carmichael & Hamilton, 1967). Institutional racism highlights the structural denial of opportunities and outcomes to Black people, such as inadequate housing, poorly resourced schools, lower educational achievement, and employment discrimination, which create cycles of unemployment, criminalisation, and neighbourhood deprivation. Police,

courts, and legal institutions became systematically biased, and Black children grew up in environments that stereotyped and destabilised their aspirations, producing what Carmichael and Hamilton identified as the reproduction of white dominance across generations.

Racism and nationalism are mutually constitutive. Hobsbawm argues that nationalism was a product of what he calls the 'dual revolution'—the French and Industrial Revolutions. Alongside this formation, racism was formed, and it remains a persistent challenge. Expanding on this, Balibar argues that national identity has no choice but to be identified with race, such that the dimensions of history, culture and politics of a nation are racialised (Miles & Brown, 2004). This can be termed nationalistic pluralism, whereby the line between we and they are never well outlined. This study examines Kimberlé Crenshaw's (1989) intersectionality theory and its relevance to the interplay of various forms of oppression, such as racism and sexism, in Zadie Smith's novel *On Beauty*. Nominated for the 2005 Man Booker Prize, Smith's novel illustrates racist stereotypes, discrimination, and cultural diversity in high-end academic institutions, while also unveiling that discrimination is not only perpetrated by white characters but also by elite black characters. As Crenshaw (1989) defines it, intersectionality is "a metaphor for understanding the ways that multiple forms of inequality or disadvantage sometimes compound themselves and create obstacles that are not understood among conventional ways of thinking." We use Crenshaw's (1989) intersectionality and Collins's (1990) matrix of domination to assert that Smith deals with social stratification and race as multiple social memberships of characters that experience in ways that a single-axis approach cannot explain. Intersectionality cannot be used in the same context as diversity; it is an instrument for comprehending the unseen power dynamics and how they contribute to the creation of structural inequality (Cho et al., 2013; Crenshaw, 1989). To examine *On Beauty* thoroughly, we dwell on four theoretical lenses: interlocking oppression, matrix of domination, double bind, and intersectional invisibility.

LITERATURE REVIEW

Smith's literary works are based on various themes of race, culture, society, and family relations, exploring the nuances and issues of racial experiences in modern multicultural communities. *On Beauty,* which was published in 2005, a novel, based on the novels of E. M. Forster, *Howards End*, is about the conservative policy of elite universities and the mental traumatisation of deprived Black children and suggests a re-evaluation of citizenship, race and plural nationalism (Amine, 2006). Smith's honest and reflective treatment of identity and race has become central to conversations about contemporary society in the UK. As a woman and writer of colour, she explores culture in literary spheres that are exclusive and restrictive, using playful wit and vibrant narratives to comprehend complex themes

of race, class, and culture. She described her own sense of community in terms that prefigure intersectional analysis: "My trouble is I can't think of community in the singular. Doesn't everyone exist in a Venn diagram of overlapping allegiances and interests?" (Cronan, 2022). As a regular contributor to *The New Yorker* and The *New York Review of Books*, her prose captures the nuances and cadences of Northwest London, demonstrating her mastery of tone, subjectivity, and compartmentalisation of experience (Magee, 2012). Cronan (2022) argues that Smith's ideas are idiosyncratic and authentic, breathing life into characters who form portraits of contemporary life, combining societal and existential concerns through writing that engages identity politics at a genuinely political level, rather than merely personal.

Research Gap Present Contribution

Existing scholarship *On Beauty* has approached the novel through various critical lenses. Batra (2010) examines the novel in terms of cosmopolitanism, transnationalism, and Black Studies, arguing that it negotiates different versions of Black diasporic belonging. Taheri (2017) reads it as a liberal fairy tale that exposes the limits of multicultural idealism. Siccardi (2020) focuses on Smith's treatment of women and domestic space in *White Teeth*, *On Beauty*, and *NW*. Lopez (2010) examines the death of aesthetic relish within academic culture as it is depicted in the novel, while Hale (2012) interrogates the novel's own engagement with aesthetic theory. Lanone (2007) situates it in relation to E. M. Forster's legacy and Tew (2013) provides a broader overview of Smith's first decade of fiction. Studies of diasporic hybridity (Pourgharib & Pourya Asl, 2022) and of gendered ideological representation (Setiadi et al., 2023) have likewise shown the value of identity-centred readings of fiction. However, none of these studies has brought together the four theoretical concepts of interlocking oppression, the matrix of domination, the double bind, and intersectional invisibility as a unified analytical framework for the novel. This study aims to fill this gap. By treating these four concepts as interlocking rather than synonymous, and by attending to the novel's own formal strategies, its irony, free indirect discourse, and dialogic structure, we produce a more rigorous intersectional reading than those currently available in the literature on Smith.

Theoretical Background

The social framework of discrimination and white privilege is shaped by colonial legacies that constitute power relations. Intersectionality was coined by Kimberlé Crenshaw (1989) as a critical response to the single-axis approach prevalent in anti-discrimination law and anti-racist politics and the idea that the experiences of Black women could not be explained through the lens of single-axis analysis (race or gender). She also contends that intersectionality is a metaphor that can be used to explain how various kinds of inequality are multiplied and form impediments that are invisible to traditional thought. One should not

confuse the intersectionality as formulated by Crenshaw (1989) with similar but conceptually different models elaborated by other Black feminist intellectuals. Although Crenshaw's (1988) writings are more scholarly oriented on the subject of discrimination and structural analysis, Patricia Hill Collins (1990) conceived the idea of the matrix of domination in Black Feminist Thought to explain how race, class, and gender are all systems of oppression that work together at the individual, cultural, and institutional levels. The matrix of domination created by Collins (1990) builds upon Crenshaw's (1989) intersectional analysis. It asserts that these systems are not additive but constitutive of each other in generating distinctive forms of power and subordination. This paper relies on both theorists, but with this analytical distinction: we will apply Crenshaw's framework to discuss the structural and legal aspects of oppression and Collins's matrix of domination to explain the patterns of institutional and cultural oppression which are deeply rooted in the novel.

The idea of the so-called double bind, used in intersectional studies (Remedios & Snyder, 2018), is a case where an individual who is marginalised in more than one way is presented with conflicting and mutually supporting demands, whereby one response could only be considered a loss. Intersectional invisibility (Remedios & Snyder, 2018) is the term that explains how the subjects who are at the intersection of the various marginalised categories, such as Black women, become invisible exactly because they do not conform to the image of the prototypical member of any of the subordinated categories. These four concepts in combination provide an analytical scaffold for the close reading of the novel that follows. The segments of the diversity wheel overlap in systems and structures that define one's experience, personality, and identity. The main dimensions of age, ethnicity, and gender are constructed at the centre of the circle. The second layer includes the social, cultural, and environmental aspects under which family, community, nationality, and belief are the components of the individual. The outer circle explains the institutional framework and systemic obstacles within which the person functions (Scottish Government, 2022). Intersectionality is directly related to social inequality. Marginalisation, suppression, discrimination, and stereotyping are not just interpersonal failures; they are structural conditions that Black people are subjected to in society. Crenshaw (1989) opines that social categorisations were established initially during the onset of racial modernity and have been solidified by rules and policies that officially embrace equality but continue to uphold the racial hierarchy. Socialisation between various communities occurs within the framework of society, where power is the prevailing aspect. Intersectionality acknowledges all inequalities and their development in a variety of social categories (Collins & Bilge, 2016; Rosette et al., 2018). According to Crenshaw (1988), the main reason why racial discrimination persists is due to the stubborn tenacity of

white dominance, which is enshrined in the American legal and socioeconomic order (Coaston, 2019). Oppressed groups are excluded from society, and intersectionality is the main tool of analysis for how to bring out and question the structural roots of inequality, although civil rights are officially enacted.

METHODS AND MATERIALS

Research Objectives

Based on Kimberlé Crenshaw's (1989) theorisation of interlocking oppressions and intersectional invisibility and Patricia Hill Collins's (1990) matrix of domination, this study investigates the various forms of oppression, each interacting with the others to produce multifaceted experiences in *On Beauty*. In particular, the paper addresses the co-occurring experiences of racism and sexism and the re-enactment of white superiority over people of colour in institutions and intimate relationships.

Methods

This study represents a close textual analysis of the novel using intersectionality theory. Crenshaw (1989) and Collins's (1990) critical concepts of interlocking oppression, intersectional invisibility, and the matrix of domination were operationalised as separate analytical tools instead of being interchangeable. Interlocking oppression is the co-commensurability of various subordination systems and their mutual reinforcement. These systems are embedded in the overall social structure, which is referred to as the matrix of domination (Collins, 2000). The term double bind refers to a no-win situation created for the occupants of overlapping marginalised identities. Intersectional invisibility refers to the invisibility of people with complex identities that cannot be subordinated to any one prototype of marginalisation. The four lenses are used by persistently closely reading chosen scenes, paying attention to narrative structure, characterisation, dialogue, irony, and the formal ambivalences of the novel.

Materials

The novel *On Beauty* by Zadie Smith (2005) is the main source of information for the current research. The novel was chosen because it directly deals with humanist issues and reveals the difficulties of existing in the world of white privilege. This is highly relevant to this research as it describes the most profound forms of racism that Black characters go through, in particular, Haitian-origin Blacks in the United Kingdom, and describes all types of racism: individual, active, passive, cultural, and institutional.

RESULTS AND DISCUSSION

On Beauty investigates the issue of racism by juxtaposing the lives of two families (the Belseys and the Kippses) whose varying attitudes to race, social status, and identity help us understand how racism functions at the individual and systemic levels. The novel explores the complex racial conflicts present in elite American universities. Through Kiki Belsey, a Black woman married to a white

intellectual, Smith shows how a Black woman is placed in the middle between being an insider and an outsider in the academic world of her husband and has to consider the needs of other people more than her own. The various types of oppression and marginalisation that are revealed by the lives of Kiki and her children on the one hand and the family of Monty Kipps on the other are structured by the ironic narrative framework of the novel that never seeks to resolve the contradictions that it reveals. There are various forms of racism in the novel, and all the characters are interrelated in exclusion and marginalisation one way or another. The significance of race in the novel is ambivalent: Smith does not present heroic black characters and villainous whites only. On the contrary, she holds all her characters, even Black characters who reproduce hierarchies of class, gender and belonging, responsible for what Collins (2000) terms the matrix of domination.

The intersectional invisibility of Kiki is formed at the beginning, and with a bang. By hosting a party in her own house among white educated elites, she imagines how she will be viewed by them as a black woman in a head wrap, walking around with a bottle in one hand and a plate of food in the other as a maid in an old movie (Smith, 2005). This scene of self-objectification has a formal role: free indirect discourse enables Smith to allow the reader to be inside the alienation of self that Kiki experiences, to see the mechanism of internalisation and reproduction of racial stereotypes by the white gaze. The image of the 'maid in an old movie' does not arise from malice but from the accumulated cultural grammar of a white-dominated social world, which Crenshaw et al. (2019) describe as "practices, networks, and other social interactions that predictably reproduced white dominance across the social terrain." Kiki experiences racial stereotyping and microaggression by the academic peers of her husband, who view her as the representative of the whole African American population, not as an individual, and resorts to humour, withdrawal, and assertion as her coping strategies. As Crenshaw (1989) argues, racial identity is not a personal issue of prejudice but a deeply rooted issue in institutional practices and cultural conventions; intersectionality points out the interrelationship of race and sex as mutually constitutive identities.

Crenshaw (1989) thinks that the difficulty of being Black in a white-dominated world is partly that any racist comment may be directed any way, and it is hard to demonstrate and justify the presence of structural inequality. She is a feminist who supports structural transformation and the breaking down of racist institutions (Crenshaw, 1989). Carl Thomas is a brilliant Black music artist and a street poet accused of stealing a painting in the office of Monty Kipps due to his race, class and identity. Refusing to be educated at the university, humiliated by Howard at the anniversary party of Kiki, he explains his marginalisation: The future is a different country, man. And I still haven't been given a passport (Smith, 2005). Carl symbolises the validation, identity and equal

opportunity of the entire black community. The disillusionment of the society that Carl has been attempting to join is shaped by the matrix of domination structures. Simultaneously, interlocking oppression is also brought out clearly when Carl enters Claire's poetry class without being an enrolled student, creating controversies that highlight the contradictions of belonging.

In her essay, Unmasking Colour-blindness in the Law, Crenshaw suggests that the logics of segregation and racial power are not only based on formal rules but also on practices, networks, and social interactions that predictably reproduce white dominance (Crenshaw et al., 2019). The intersectional invisibility of Kiki is revealed not only through microaggressions but also through structural isolation: being in a mostly white neighbourhood, Kiki is socially deprived of peers. The importance of the interior monologue used by Smith here is important: the loneliness of Kiki is not the expression of self-pity, but rather an expression of a political situation, the work of a spatial and social hierarchy that allocates belonging by racial categories. Her friendship with Mrs. Kipps, despite their husbands' rivalry, symbolises the unity through the experience of the white world. Mrs. Kipps's remark, "There is such a shelter in each other" (Smith, 2005), is not merely an expression of friendship but a recognition of mutual intersectional invisibility. When Mrs. Kipps says, "You have a marvellous face…and the moment I saw you I knew I would like you" (Smith, 2005), she affirms an identity that the white academic world has consistently failed to see. Crenshaw focuses on the intersections of race and gender, highlighting the fact that the social world is constructed on multiple grounds of identity (Crenshaw, 1991). Levi's experience of racial belonging, articulated through his sense of homecoming in a Black neighbourhood

> How strange it was to see streets where everybody was black-nobody looked at him twice
>
> (Smith, 2005)

The irony that Smith has used here as a liberation is that one is not being looked at: the invisibility of Levi in the Black neighbourhood is the exact opposite of the invisibility of Kiki in the white world. The Haitian worker's cause in Wellington and his assistance to the Haitian group are indicative of his adherence to Black identity, which has been in constant conflict due to his mixed-race family life. His interrogative, which is addressed to some conceived Wellington audience, is in the novel translated with very suppressed scorn of liberal universalism.

> That is the question I pose to all fair-minded Wellingtonians today. Are we truly steadfast in our commitment to equality of opportunity, or not? Do we presume to speak of progress when, within these very walls, our policy remains so shamefully hesitant? Are we satisfied that the African American youth of this fair city?
>
> (Smith, 2005)

Levi hails from a mixed-race family and has the privilege of studying at

Wellington University because of his white father; he often wonders whether racism and differences of opinion are related to blackness. His friend Felix from Haiti was, in Levi's description, "blacker than any black man," possessing skin "like slate," yet withholding the "true essence of blackness" in ways that confound simple racial taxonomy. Haiti's history of slavery and oppression is detailed through Levi's engagement with it.

> A country close to America that you never hear about, where thousands of black people have been enslaved, have struggled and died in the streets for their freedom
>
> (Smith, 2005)

Crenshaw's (1991) analysis of the racialised subject draws attention to the fact that people of colour are differently situated across economic, social and political worlds. The model of domination suggested by Collins (2000) comes in quite handy in this case: it designates the structural architecture in which these various positionings of difference are created, not as a consequence of personal prejudice, but as the product of interlocked systems within the institutions of education, employment and criminal justice. The matrix also points to how the dominant groups maintain power and privilege over the marginalised groups through institutional set-ups that seem to be neutral. In the novel, Smith reflects the anguish of this oppression of the Haitian people:

> do not ever sell your soul, my brother… Everybody tries to buy a blackman. But he can't be bought. His day is coming
>
> (Smith, 2005)

This text describes what Collins (2000) describes as the outsider-within stance: the awareness of the persons who are part of the institutional context of conditions that do not recognise their entire humanity. The biggest scene in this respect is the funeral of Mrs Carlene Kipps, which Smith makes a surreal event that suspends the racial hierarchy in the moment. Jerome observes:

> You can tell she knew every type of person. Can you imagine a funeral—or any other event—like this, back home?"
>
> (Smith, 2005)

The story of Smith here is typically ironic: when there is democratic mixing at the funeral, the contrast is the segregation of common social life. Death is the only place in the novel where race is not used as a principle of exclusion, a darkly comical critique of the liberal university world. It is the visit of Howard to his parents after the funeral that leads to an episode of interlocking oppression: the father of Howard, not able to accept Kiki, expresses the logic of racial hierarchy in open-mindedness: "You couldn't expect black people to develop mentally like white people do" (Smith, 2005), and, on hearing that Kiki has found comfort elsewhere, attributes this to a racial essence: "It's their nature" (Smith, 2005). The fact that Smith puts this

racism in the mouth of an Englishman of the working class is formally important: it sends the liberal homogenisation of racism, that it is a condition of the uneducated, home on its head, when Howard himself behaves so with Kiki, that he is indifferent to her, that he thinks her intellectually inferior to him. Crenshaw states that racism and sexism are interconnected forms of interlocking oppression, especially as experienced by Black women in every aspect of their lives, both personally and professionally; Black women live through discrimination and marginalisation shaped by both race and gender (Crenshaw, 2006). Howard met his wife Kiki as a young nursing student, when her beauty was, in the novel's phrase, "natural, honest, powerful, unmediated, and full of genuine desire." Although she was not one of Howard's intellectual peers, she was politically engaged and feminine. Later, Howard became intolerant of her weight gain and ageing, his dislike expressing itself through an affair with Claire Malcolm, a white colleague:

> In the spring it was someone, a nameless someone, it was a one-night stand—now it's Claire Malcolm. It went on for weeks!
>
> (Smith, 2005)

After Howard's affair extended to Mr. Kipps's daughter, Victoria, Kiki left him to reflect on his mistakes. She tolerated the matrix of white domination, the oppression of her educated white colleagues, and marginalisation in the white community, yet Howard failed to perceive her needs as a Black woman. His white superiority is evident in his journey to England to prevent Jerome's relationship with Victoria because of her Black heritage. Victoria's praise of Kiki to Howard— "She's like a Queen. Imperious-looking…Like an African Queen" (Smith, 2005)—is an instance of the novel's formal irony: Victoria affirms Kiki's dignity in terms that Howard cannot hear, because his white liberal consciousness is structured precisely by the invisibility of that dignity. The double bind here is sharp: Kiki is praised for her queenly bearing at the very moment when her husband is conducting an affair with the woman praising her.

Jerome's and Victoria's relationship is established at the opening of the novel, with Jerome finding in the Kipps household an adaptability and belonging that his own family has not provided: "I love living here. It's a different universe" (Smith, 2005); "The Kippses continue to grow on me" (Smith, 2005). When Monty suggested that minority groups often claim equal rights they have not received, Jerome found himself identifying with the minority position; when Michael argued that being Black was merely "an accidental matter of pigment," Jerome began to reckon with his own mixed-race identity. The novel insists, through Jerome's experience, that 'accidental pigment' has material consequences in a world that distributes opportunities along racial lines.

Crenshaw (1991) mentions that individuals experience marginalisation within their own marginalised groups, leading to isolation and exclusion. The social isolation of Kiki spreads even to her

family: her children deprive her of the right to communicate with Mrs. Kipps, making the Kipps family the adversary in the academic battle between Howard and Mrs. Kipps. It is a moment of quiet bitterness on the part of Smith, of how the children recreate the logics of male academic rivalry by policing their mother's social world. Kiki's response—"You all have your life, and I have no life?" (Smith, 2005). This reaction is not a melodrama. It is an accurate expression of intersectional invisibility: the Black woman, whose desires and needs are made invisible by the needs of those who surround her. Kiki's social isolation intensifies as she declares, "My whole life is White" (Smith, 2005). She notes that the only Black people she sees in her day-to-day life are those cleaning floors in the Wellington College café or pushing hospital beds- a spatial arrangement of bodies that renders the matrix of domination material. It is not merely a lament of solitude which she witnesses but a sort of structural study. The physical space of the institution reproduces the racial hierarchy by determining which bodies are visible, where, and in what forms.

Crenshaw argues, "If you are a woman, then you are more victimised than a man, and if you are black, then you are more victimised than if you were white" (Coaston, 2019). Kiki describes herself as the only Black woman in the Wellington Choir, which she considers to be an army of the devil, where the white members are in the position of critical judgment. Jerome's entire involvement in the white choir music gives Kiki mixed feelings of pride and shame:

> After all, how many other young black men would even show up to something like this, I wouldn't be surprised to find that there is not one in this whole crowd
>
> (Smith, 2005)

It is the intersection of the matrix of white domination, interlocking oppression, and the double bind, and the intersectional invisibility that all come together in the voice of Kiki here. The fact that Jerome was included and at the same time Black was not in the white elite community underlines the duality of the intersectionally marginalised subject: it is a cause of joy to be included and at the same time a cause of grief to be excluded. Kiki's message to the Black community carries a weight of accumulated experience:

> And there's no big secret, not at all, you need to have faith, I guess, and you need to counter the dismal self-image that black men receive as their birth right from America—that's essential—and, I don't know…get involved in after school activities, have books around the house, and, sure, have a little money, and a house with outdoor…
>
> (Smith, 2005)

Crenshaw further argues that claims of equality for Black America "may fall upon deaf ears—ears deafened by repeated declarations that equality exists" (Crenshaw, 1988). Howard, a white professor at Wellington College, created a mixed-race family with his Black wife, Kiki. His exaggerated praise of the white academic

community and his neglect of his family's experience of racial inadaptability led to Kiki's oppression and marginalisation within the family. Kiki was not invited into the white, educated elite community and always felt isolated and distinct. Racial equality is not appreciated; rather, the matrix of white domination and intersectional invisibility is reproduced through Howard's indifference. Carl Thomas was denied a place at Wellington College because of his race, while Levi, though not interested in college, was compelled to attend because he had a white father. Haitian immigrants were denied basic rights and, without proper education, obliged to take undervalued jobs:

> This was a Haitian fellow driver called Pierree, one of the many from that difficult island who now found occupation
>
> (Smith, 2005)

On visiting the market, Kiki encounters a Haitian trader whose depression and suppression in the white-dominated community are evident. His refusal to accept the designation 'African American' and insistence on his Haitian identity speak to what intersectional theory recognises as the diversity within marginalised communities—the way in which intersectional frameworks must account for the specificity of national, cultural, and migratory experience. Institutional racism hinders the growth of the next generation, and Crenshaw (1988) emphasises that racism is not just about individual actions but also about institutional practices and policies that perpetuate racial inequality. In the novel, the university has a visible Black student population that forms a separate enclave—a mini-university within the university. Levi wonders why Wellington has this Black enclave, as Black students experience intersectional invisibility and often shelter within their community. The matrix of domination by white people suppresses and marginalises students of colour. Institutional racism extends to the faculty: the ideological conflict between Howard and Monty Kipps over Rembrandt is structurally revealing. What appears as an aesthetic dispute—Howard's scepticism about Rembrandt's genius versus Kipps's conviction that beauty comes from God—is in fact a contest over cultural authority, in which the white liberal Howard seeks to delegitimise the intellectual tradition that a Black conservative like Kipps has invested with personal and communal significance. Howard sees Kipps's Rembrandt book as "retrogressive, perverse, infuriatingly essentialist" (Smith, 2005). Yet, the novel's irony turns the judgment back on Howard: it is Howard who has not finished his own book, and it is Kipps's work—whatever its politics—that circulates in the world. The matrix of domination does not map neatly onto a Black/white binary; Smith insists on its more complex and ambivalent operation.

For 15 years, Howard and Kipps had moved in similar professional circles. Howard always disliked Monty because of his right-wing politics. He converted

this antagonism into rage when he heard of Kipps's Rembrandt book: "Take your pick. State of Britain, State of the Caribbean, states of blackness, state of art, state of women, state of the states—you hum it, he will play it" (Smith, 2005). Kiki's support of Kipps's anti-affirmative action bill—noting that he believes it is belittling for African American children to be told they need special assistance—places Smith's novel in dialogue with the complex politics of Black conservatism and the internal diversity of Black political thought. Monty Kipps informs Howard that he curated the first American exhibition of Caribbean 'Primitives' in New York in 1965: "I have the largest collection of Haitian art in private hands outside of that unfortunate island" (Smith, 2005). Haitian art—encompassing paintings, sculptures, drum art, and Voodoo flags, using vibrant colours and motifs with intricate meanings—is not only a cultural product of a single community but has also received international acclaim (Hatta, 2018). The representation of Black culture in white-dominated spaces becomes difficult when interlocking oppression and marginalisation operate on a large scale. The irony of a Black conservative claiming ownership of Haiti's cultural heritage while opposing affirmative action illustrates one of the novel's central insights: that the matrix of domination is not simply reproduced by white subjects but is internalised and mobilised in complex ways by those within marginalised communities. Smith's refusal to exempt Black characters from critique is one of the novel's most significant formal choices.

CONCLUSION

This study examined the multiple forms of oppression that intersect to create complex experiences in Zadie Smith's *On Beauty*, bringing together Kimberlé Crenshaw's (1989) intersectionality, Patricia Hill Collins's (1990) matrix of domination, and the related concepts of double bind and intersectional invisibility as a unified but internally differentiated analytical framework. By maintaining the distinction between Crenshaw's structural-legal analysis and Collins's cultural-institutional framework, we produced a more conceptually rigorous reading than those currently available in the literature. We argue that racism exists collectively in all aspects of society, from educational institutions and workplaces to communities and intimate relationships, persisting from birth to death. The constant rivalry between Kipps and Howard over Rembrandt portrays racism within educated elite society. Kiki's emotional turbulence, search for identity, final solace from Mrs. Kipps, and the significance of Mrs. Kipps's death and final gift together signify interlocking oppression and intersectional invisibility in every aspect of Kiki's life. A close reading of the novel suggests that every character encounters the matrix of domination and that the double bind is never far from the Black experience in the text.

Crucially, the analysis reveals that Smith's narrative form, its irony, free indirect discourse, and strategic ambivalence do not simply illustrate intersectional theory but perform it. The novel does

not attempt to resolve the contradictions that it uncovers, but rather involves all its characters, including the Blacks like Monty Kipps and Levi, in the reproduction of hierarchies. The mere fact that Smith will not give an easy answer is in itself a formal argument: racial inequality is not the result of personal villainy but of systems of interdependence that reproduce themselves even on their victims. According to Crenshaw (1991), racial identity is a complex and multifaceted phenomenon. She is against the normalisation of a one-axis system. She demands that power relations be central to the formation of racial identity as it enters the stage of marginalisation and oppression. Race, oppression, and subjugation are the novel's underlying themes. As the current reading illustrates, On Beauty depicts different types of oppression not only against immigrants but also against mixed-race people and second-generation people with one parent of white origin. This is most evident in the characters of Jerome, Levi, and Kiki. The last present that Mrs. Kipps gives Kiki wraps the most important political lesson of the novel: the cultural and historical heritage of Black communities cannot be entrusted to the care of white liberal institutions and must be maintained by the solidarity of Black communities.

This study makes three contributions to the disciplines of literary studies, race studies, and intersectional criticism. First, it shows the analytical usefulness of the distinction between intersectionality as developed by Crenshaw (1989) and the matrix of domination developed by Collins (1990) as it is applied to literary analysis, illustrating how each of the two concepts sheds light on various dimensions of the racial politics of the novel. Second, it identifies Smith's narrative form as intersectional—using irony, ambivalence, and free indirect discourse to refuse the single-axis analysis that intersectional theory critiques. Third, it opens directions for further research on Black conservatism and its internal contradictions as a literary subject, diasporic Haitian identity as it operates within African American political frameworks, gendered racialisation in mixed-race families in contemporary British fiction, and the limits and possibilities of institutional belonging for Black students and faculty in elite academic settings.Social justice for Black people is always a constant struggle, one that must be endured and accepted, even as power dynamics continue to favour the dominant. Smith's *On Beauty* depicts the intersection of race and identity in all its forms throughout the narrative, tracing a process of change, growth, and evolution that is never complete or easy.

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REFERENCES

Amine, L. (2006). Zadie Smith's *On Beauty*. *Postcolonial Text, 2*(4). https://doi.org/10.63260/pt.v2i4.571

Batra, K. (2010). Kipps, Belsey, and Jegede: Cosmopolitanism, transnationalism, and Black studies in Zadie Smith's *On Beauty*. *Callaloo, 33*(4), 1079-1092. https://doi.org/10.1353/cal.2010.0086

Carmichael, S., & Hamilton, C. V. (1967). *Black power: The politics of liberation in America*. Vintage Books.

Cho, S., Crenshaw, K. W., & McCall, L. (2013). Toward a field of intersectionality studies: Theory, applications, and praxis. *Signs: Journal of Women in Culture and Society, 38*(4), 785-810. https://doi.org/10.1086/669608

Coaston, J. (2019). *The intersectionality wars*. Vox. https://www.vox.com/the-highlight/2019/5/20/18542843/intersectionality-conservatism-law-race-gender-discrimination

Collins, P. H. (1990). *Black feminist thought: Knowledge, consciousness, and the politics of empowerment* (1st ed.). Routledge.

Collins, P. H. (2000). *Black feminist thought: Knowledge, consciousness, and the politics of empowerment* (2nd ed.). Routledge.

Collins, P. H., & Bilge, S. (2016). *Intersectionality*. Polity Press.

Crenshaw, K. (1989). Demarginalizing the intersection of race and sex: A Black feminist critique of antidiscrimination doctrine, feminist theory and antiracist politics. *University of Chicago Legal Forum, 1989*(1), 139-167. https://chicagounbound.uchicago.edu/uclf/vol1989/iss1/8/

Crenshaw, K. (1991). Mapping the margins: Intersectionality, identity politics, and violence against women of color. *Stanford Law Review, 43*(6), 1241-1299. https://www.jstor.org/stable/1229039

Crenshaw, K. W. (1988). Race, reform, and retrenchment: Transformation and legitimation in antidiscrimination law. *Harvard Law Review, 101*(7), 1331-1387. https://doi.org/10.2307/1341398

Crenshaw, K. W. (2006). Intersectionality, identity politics and violence against women of color. *Kvinder, Køn & Forskning*, (2-3). https://doi.org/10.7146/kkf.v0i2-3.28090

Crenshaw, K. W., Harris, L. C., HoSang, D. M., & Lipsitz, G. (Eds.). (2019). *Seeing race again: Countering colorblindness across the disciplines*. University of California Press.

Cronan, T. (2022, June 20). Zadie Smith finds her way to class. *Los Angeles Review of Books*. https://lareviewofbooks.org/article/zadie-smith-finds-her-way-to-class/

Hale, D. J. (2012). On beauty as beautiful? The problem of novelistic aesthetics by way of Zadie Smith. *Contemporary Literature, 53*(4), 814-844. https://doi.org/10.1353/cli.2012.0033

Hatta, Y. (2018). *Caribbean introduction series: News from Haiti*. The Association for Promotion of International Cooperation. https://www.apic.or.jp/english/projects/haiti000-eng.html

Knox, R. (1850). *The races of men: A fragment*. H. Renshaw. https://archive.org/details/bub_gb_XwQXAAAAYAAJ

Lanone, C. (2007). Médiating multicultural muddle: E. M. Forster meets Zadie Smith. *Études Anglaises, 60*(2), 185. https://doi.org/10.3917/etan.602.0185

Lopez, G. (2010). After theory: Academia and the death of aesthetic relish in Zadie Smith's *On Beauty* (2005). *Critique: Studies in Contemporary Fiction, 51*(4), 350-365. https://doi.org/10.1080/00111610903380030

Magee, C. M. (2012). Exclusive: The first lines of Zadie Smith's *NW*. *The Millions*. https://themillions.com/2012/07/exclusive-the-first-lines-of-zadie-smiths-nw.html

Miles, R., & Brown, M. (2004). *Racism* (2nd ed.). Routledge.

Pourgharib, B., & Pourya Asl, M. (2022). Cultural translation, hybrid identity, and third space in Jhumpa Lahiri's *Interpreter of Maladies*. *Pertanika Journal of Social Sciences and Humanities, 30*(4), 1657-1671. https://doi.org/10.47836/pjssh.30.4.10

Rattansi, A. (2020). *Racism: A very short introduction* (2nd ed.). Oxford University Press.

Remedios, J. D., & Snyder, S. H. (2018). Intersectional oppression: Multiple stigmatised identities and perceptions of invisibility, discrimination, and stereotyping. *Journal of Social Issues, 74*(2), 265-281. https://doi.org/10.1111/josi.12268

Rosette, A. S., Ponce de Leon, R., Koval, C. Z., & Harrison, D. A. (2018). Intersectionality: Connecting experiences of gender with race at work. *Research in Organizational Behavior, 38*, 1-22. https://doi.org/10.1016/j.riob.2018.12.002

Scottish Government. (2022, March 9). *What is meant by the concept of "intersectionality"?* https://www.gov.scot/publications/using-intersectionality-understand-structural-inequality-scotland-evidence-synthesis/pages/3/

Setiadi, D., Priyatna, A., & Rahayu, L. M. (2023). The portrayal of women in the works of Sugiarti Siswadi as the manifestation of Lekra and Gerwani ideology. *Pertanika Journal of Social Sciences and Humanities, 31*(2), 527-543. https://doi.org/10.47836/pjssh.31.2.04

Siccardi, J. (2020). "There is such a shelter in each other": Women looking for homes in Zadie Smith's *White Teeth*, *On Beauty* and *NW*. *African and Black Diaspora: An International Journal, 13*(2), 215-226. https://doi.org/10.1080/17528631.2020.1750173

Smith, Z. (2005). *On beauty*. Penguin Books.

Taheri, Z. (2017). Liberal fairy tales: The tale of the other in Zadie Smith's *On Beauty*. *The Explicator, 75*(2), 95-98. https://doi.org/10.1080/00144940.2017.1312253

Tew, P. (2013). *Reading Zadie Smith: The first decade and beyond*. Bloomsbury Academic.

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Emosi Marah dalam Novel *Hari-hari Terakhir di Jesselton*

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ABSTRAK

Kajian emosi dalam teks naratif banyak memberikan tumpuan kepada pengelasan emosi, pengalaman psikologi watak dan bentuk bahasa. Namun begitu, hubungan antara rangsangan situasi, penilaian kognitif dan strategi bahasa dalam pemaknaan emosi masih belum dijelaskan secara menyeluruh. Kajian ini bertujuan menganalisis pemaknaan emosi marah dalam dialog novel *Hari-hari Terakhir di Jesselton* berdasarkan kerangka Hude (2006). Kajian ini turut merumuskan hubungannya dengan pemikiran dan nilai sosial yang digambarkan dalam teks. Kajian menggunakan pendekatan kualitatif dengan kaedah analisis kandungan. Sebanyak 91 dialog yang memenuhi kriteria emosi marah dikenal pasti daripada keseluruhan novel dan dianalisis berdasarkan rangsangan situasi, penilaian kognitif, penggunaan bahasa, bentuk ekspresi dan konteks interaksi. Data diurus menggunakan NVivo, manakala pentafsiran dilakukan berdasarkan kerangka Hude (2006). Dapatan menghasilkan tiga tema, iaitu ancaman terhadap kuasa dan maruah sebanyak 41 dialog (45%), keinginan yang tidak tercapai sebanyak 26 dialog (29%) dan penilaian terhadap kebatilan sebanyak 24 dialog (26%). Analisis menunjukkan bahawa strategi bahasa marah berubah mengikut penilaian watak terhadap rangsangan. Ancaman terhadap kuasa dan maruah mendorong penegasan kedudukan atau usaha mempertahankan harga diri. Kegagalan mencapai matlamat pula mendorong kecaman, desakan atau pertahanan diri. Sementara itu, penilaian terhadap kebatilan mendorong penolakan, kritikan dan tuntutan keadilan. Kajian ini memperluas penggunaan

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kerangka Hude (2006) dengan menunjukkan bahawa pemaknaan emosi marah terbentuk melalui hubungan antara rangsangan situasi, penilaian kognitif, strategi bahasa dan fungsi ujaran dalam konteks interaksi.

Kata kunci: Bahasa emosi; dialog novel; emosi marah; penilaian kognitif; pemaknaan emosi

ABSTRACT

Studies of emotion in narrative texts have largely focused on emotion classification, characters' psychological experiences, and linguistic forms. However, the relationship between situational stimuli, cognitive appraisal, and language strategies in the meaning construction of emotion has not yet been fully explained. This study aims to analyse the meaning construction of anger in the dialogues of Hari-hari Terakhir di Jesselton *based on Hude's (2006) framework. It also examines its relationship with the thoughts and social values represented in the text. The study employed a qualitative approach using content analysis. A total of 91 dialogues that met the criteria for anger were identified and analysed in terms of situational stimuli, cognitive appraisal, language use, forms of expression, and interactional context. The data were managed using NVivo, while the interpretation was guided by Hude's (2006) framework. The findings reveal three themes: threats to power and dignity, 41 dialogues (45%); unfulfilled desires, 26 dialogues (29%); and appraisal of wrongdoing, 24 dialogues (26%). The analysis shows that anger-related language strategies vary according to the characters' appraisal of the stimuli. Threats to power and dignity prompt characters to assert their position or defend their self-worth. Failure to achieve goals prompts criticism, demands, or self-defence. Meanwhile, the appraisal of wrongdoing prompts rejection, criticism, and demands for justice. This study extends the application of Hude's (2006) framework by demonstrating that the meaning construction of anger emerges through the relationship between situational stimuli, cognitive appraisal, language strategies, and utterance functions within interactional contexts.*

Keywords*: Anger, cognitive appraisal, emotion language, meaning construction of emotion, novel dialogue*

PENGENALAN

Bahasa berperanan menyampaikan pemikiran, perasaan dan nilai dalam hubungan sosial. Dalam karya kreatif, khususnya novel, bahasa menjadi medium bagi pengarang menggambarkan pengalaman, pemikiran dan emosi watak (Siti Farida Salleh et al., 2020). Penyampaian tersebut dapat dilihat melalui dialog yang menggambarkan konflik, hubungan sosial, pemikiran dan emosi watak. Walaupun dirancang oleh pengarang, dialog fiksyen dibentuk berdasarkan ciri perbualan sebenar untuk menghasilkan komunikasi yang kelihatan semula jadi dan spontan (Baños-Piñero & Chaume, 2009; Nykänen & Koivisto, 2016). Oleh itu, dialog novel dapat dijadikan data linguistik untuk meneliti penggunaan bahasa dalam konteks interaksi.

Salah satu emosi yang sering muncul dalam situasi konflik ialah emosi marah. Emosi ini boleh tercetus akibat layanan

yang tidak wajar serta dipengaruhi oleh faktor persekitaran, keluarga dan sosial (Sariban et al., 2020). Apabila diekspresikan melalui ujaran, kemarahan mempengaruhi pemilihan dan penggunaan bahasa. Schultz-Palma (1996) menjelaskan bahawa konflik verbal sering menunjukkan perubahan dalam pemilihan leksikal, penggunaan kata berkonotasi negatif, peningkatan nada suara dan pengabaian terhadap norma komunikasi biasa. Namun begitu, emosi marah tidak semestinya dinyatakan secara langsung melalui kata emosi atau ungkapan kasar. Emosi ini juga boleh disampaikan melalui sindiran, soalan retorik, arahan, penegasan dan bentuk bahasa lain bergantung kepada konteks interaksi.

Dari sudut psikolinguistik, pemaknaan emosi melibatkan hubungan antara bahasa dengan proses kognitif ketika individu mentafsir sesuatu situasi. Hoemann et al. (2025) menegaskan bahawa analisis bahasa tidak seharusnya terbatas pada label emosi, sebaliknya perlu mengambil kira sumber bahasa yang digunakan untuk memahami pemaknaan emosi. Dalam kajian ini, pemaknaan emosi merujuk kepada pentafsiran emosi marah berdasarkan hubungan antara rangsangan situasi, penilaian kognitif watak, strategi bahasa dan konteks interaksi.

Kajian ini memilih novel *Hari-hari Terakhir di Jesselton* karya Ruhaini Matdarin (2018) yang memaparkan konflik sosial, perebutan kuasa dan tekanan emosi melalui interaksi antara watak. Novel ini turut menerima Hadiah Sastera Perdana Malaysia 2017/2018 (Hazira Ahmad Zaidi, 2025). Berdasarkan kerangka emosi Hude (2006), kajian ini meneliti pemaknaan emosi marah dengan memberikan perhatian kepada hubungan antara rangsangan situasi, penilaian kognitif, strategi bahasa serta pemikiran dan nilai sosial yang digambarkan melalui interaksi watak.

Pernyataan Masalah

Kajian emosi dalam teks naratif semakin berkembang dalam pelbagai disiplin ilmu. Namun, penelitian terdahulu masih banyak memberikan tumpuan kepada pengelasan kategori emosi tanpa menghuraikan proses pembentukan makna secara mendalam. Klinger et al. (2020) menjelaskan bahawa kajian emosi dalam teks fiksyen sering tertumpu pada pengelasan kategori tanpa mengambil kira struktur pengalaman emosi seperti pelaku, faktor pencetus dan sasaran emosi. Vishnubhotla et al. (2024) pula menunjukkan bahawa novel sering dianalisis sebagai satu aliran emosi secara keseluruhan sehingga perbezaan pengalaman emosi antara watak kurang diberikan perhatian. Keadaan ini menyebabkan proses pemaknaan emosi belum dijelaskan secara menyeluruh. Proses tersebut melibatkan hubungan antara peristiwa yang mencetuskan emosi, penilaian watak terhadap peristiwa tersebut dan bahasa yang digunakan untuk mengekspresikan emosi.

Emosi dalam teks naratif juga tidak semestinya dinyatakan melalui kata emosi secara langsung. Pertukaran penutur dan nada emosi sering disampaikan secara tersirat sehingga pentafsirannya memerlukan penelitian terhadap konteks yang mengiringi

dialog (Patil et al., 2026). Oleh itu, bentuk bahasa seperti makian, sindiran, arahan atau soalan retorik sahaja belum memadai untuk menjelaskan sebab sesuatu ujaran membawa makna marah dalam konteks tertentu. Hal ini dikatakan demikian kerana pemaknaan emosi marah turut melibatkan hubungan antara rangsangan situasi, penilaian kognitif watak, strategi bahasa yang digunakan serta fungsi ujaran dalam interaksi. Strategi bahasa yang sama juga tidak semestinya membawa makna dan fungsi ujaran marah yang sama apabila digunakan dalam situasi dan hubungan sosial yang berbeza-beza.

Dalam konteks kajian tempatan, penelitian emosi dalam karya kreatif lebih banyak memberikan perhatian kepada psikologi watak, jenis emosi, pemilihan kosa kata dan metafora (Nor Hafuza Muhammad Arif et al., 2024; Norazimah Zakaria & Mazarul Hasan Mohamad Hanapi, 2020; Sariban et al., 2020). Penelitian tersebut belum menghubungkan secara menyeluruh rangsangan situasi, penilaian kognitif dan strategi bahasa dalam menjelaskan pemaknaan emosi marah dalam interaksi. Oleh itu, kajian ini menggunakan kerangka emosi Hude (2006) untuk meneliti hubungan tersebut dan seterusnya merumuskan pemikiran dan nilai sosial yang digambarkan melalui interaksi watak dalam novel *Hari-hari Terakhir di Jesselton*.

Objektif Kajian

Kajian ini mempunyai dua objektif, iaitu:

1. Menganalisis pemaknaan emosi marah dalam dialog novel *Hari-hari Terakhir di Jesselton* berdasarkan kerangka emosi Hude (2006); dan
2. Merumuskan hubungan bahasa emosi marah dengan pemikiran dan nilai sosial yang digambarkan dalam dialog novel tersebut.

SOROTAN KAJIAN

Kajian terdahulu menunjukkan bahawa pemahaman emosi tidak seharusnya hanya tertumpu pada label emosi semata-mata. Hoemann et al. (2025) menjelaskan bahawa makna emosi dibentuk melalui hubungan antara bahasa dengan proses perhatian (*attention*), pentafsiran (*construal*) dan penilaian (*appraisal*). Klinger et al. (2020) pula menunjukkan bahawa analisis emosi dalam teks fiksyen perlu mengambil kira pihak yang mengalami emosi dan peristiwa yang mencetuskannya. Kedua-dua kajian ini menunjukkan bahawa pemaknaan emosi melibatkan hubungan antara bahasa, rangsangan, penilaian dan konteks.

Hubungan sosial turut mempengaruhi penggunaan bahasa untuk mengekspresikan emosi. Parkinson (2023) menjelaskan bahawa bahasa emosi bukan sahaja menggambarkan keadaan emosi, tetapi turut menjalankan fungsi sosial dalam interaksi. van Kleef dan Lange (2020) pula menunjukkan bahawa kuasa dan status mempengaruhi cara individu mengalami dan mengekspresikan emosi. Dalam penelitian bahasa marah, Ulrikayanti (2022) serta Nova dan Winarti (2024) menunjukkan bahawa kemarahan dapat disampaikan melalui pelbagai strategi, termasuk sindiran, humor sinis, makian dan bentuk ujaran tertentu. Kajian-kajian ini menjelaskan bahawa ekspresi marah berkaitan dengan

bahasa, tujuan komunikasi dan hubungan sosial. Namun demikian, penelitian tersebut belum menjelaskan secara menyeluruh hubungan antara penilaian terhadap sesuatu situasi dengan strategi bahasa yang dipilih. Hubungannya dengan fungsi ujaran marah dalam konteks interaksi juga belum diberikan perhatian yang mencukupi.

Penelitian emosi dalam karya kreatif pula menunjukkan kecenderungan yang berbeza-beza. Vishnubhotla et al. (2024) dan Klinger et al. (2020) mengambil kira watak, peristiwa dan pencetus emosi, tetapi menggunakan pendekatan yang lebih berorientasikan analisis perkomputeran. Seterusnya, kajian Norazimah Zakaria dan Mazarul Hasan Mohamad Hanapi (2020), Nurul Norasuwat Rosli dan Nordiana Hamzah (2020) serta Sariban et al. (2020) pula lebih memberikan perhatian kepada pengalaman dan aspek psikologi emosi watak. Penelitian linguistik pula menumpukan pola bahasa dalam media sosial (Umaimah Kamarulzaman et al., 2023), kosa kata emosi (Nani Sunarni, 2022) dan metafora emosi (Nor Hafuza Muhammad Arif et al., 2024). Perbandingan ini menunjukkan bahawa kajian karya kreatif lebih menekankan pengalaman emosi dan konteks watak, manakala kajian linguistik lebih memberikan perhatian kepada bentuk bahasa. Hubungan antara kedua-dua aspek tersebut, khususnya antara penilaian kognitif watak dengan strategi bahasa yang digunakan untuk menyatakan kemarahan, masih belum dijelaskan secara khusus.

Secara keseluruhannya, kajian terdahulu telah mengenal pasti bahasa, rangsangan, penilaian kognitif, tujuan komunikasi dan hubungan sosial sebagai unsur penting dalam memahami emosi. Namun, unsur-unsur tersebut lebih banyak diteliti secara berasingan. Hal ini menunjukkan bahawa masih belum jelas hubungan antara rangsangan situasi, penilaian kognitif, strategi bahasa dan fungsi ujaran dalam pemaknaan emosi marah dalam dialog karya kreatif. Jurang ini penting kerana makna marah tidak semestinya ditandai oleh kata emosi secara eksplisit. Makna tersebut juga dapat dikenal pasti melalui penilaian watak terhadap sesuatu situasi dan penggunaan bahasa sebagai tindak balas terhadap situasi tersebut. Oleh itu, kajian ini menggunakan kerangka Hude (2006) sebagai asas untuk meneliti pemaknaan emosi marah melalui hubungan antara rangsangan situasi, penilaian kognitif, strategi bahasa dan fungsi ujaran dalam dialog novel *Hari-hari Terakhir di Jesselton*.

Kerangka Teori

Kajian ini menggunakan kerangka emosi Hude (2006) sebagai asas untuk menjelaskan pemaknaan emosi marah dalam dialog novel. Menurut Hude (2006), emosi merupakan gejala psikofisiologi yang mempengaruhi persepsi, pemikiran dan tingkah laku manusia. Emosi dapat diklasifikasikan kepada enam kategori asas, iaitu gembira, marah, sedih, takut, benci dan hairan atau terkejut. Kajian ini memberikan tumpuan terhadap emosi marah yang banyak dipaparkan melalui konflik dan ketegangan antara watak dalam novel yang dikaji. Berdasarkan kerangka Hude (2006), emosi

terbentuk apabila rangsangan daripada sesuatu peristiwa atau keadaan dinilai berdasarkan pengalaman, kepercayaan, keinginan dan nilai individu. Penilaian tersebut mempengaruhi emosi yang dialami dan cara emosi diekspresikan melalui bahasa atau tingkah laku. Oleh itu, situasi yang sama boleh menghasilkan tindak balas emosi yang berbeza berdasarkan penilaian individu terhadap situasi tersebut.

Berdasarkan Hude (2006), emosi marah boleh tercetus apabila individu menilai sesuatu keadaan sebagai ancaman, halangan terhadap keinginan atau perkara yang bertentangan kebenaran. Berdasarkan penjelasan tersebut, data emosi marah dalam kajian ini dibahagikan kepada tiga tema, iaitu ancaman terhadap kuasa dan maruah, keinginan yang tidak tercapai dan penilaian terhadap kebatilan. Ancaman terhadap kuasa dan maruah merujuk kepada situasi yang dinilai menggugat kedudukan, kewibawaan atau harga diri watak. Keinginan yang tidak tercapai merujuk keadaan apabila matlamat, kehendak atau jangkaan watak terhalang. Penilaian terhadap kebatilan pula merujuk kepada situasi yang dinilai bertentangan dengan kebenaran, keadilan atau hak. Jika sesuatu dialog mengandungi lebih daripada satu rangsangan, pengelompokan dibuat berdasarkan rangsangan dan penilaian yang paling dominan dalam konteks interaksi.

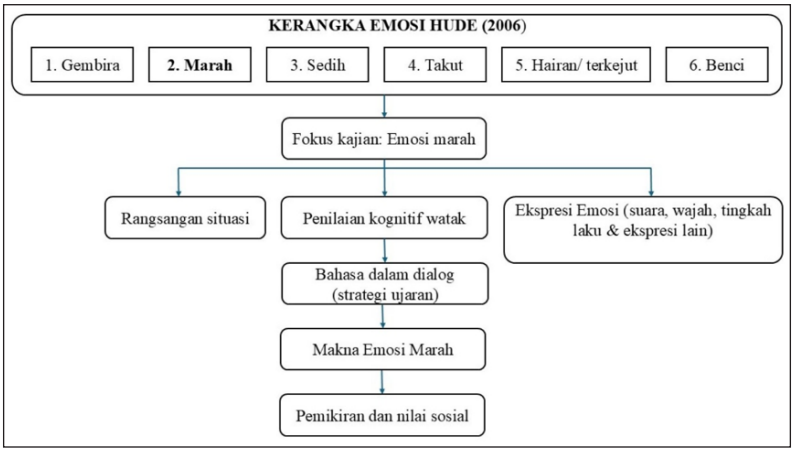
Selain bahasa dalam dialog, ekspresi emosi yang dinyatakan dalam naratif digunakan sebagai maklumat sokongan. Hude (2006) membahagikan ekspresi emosi kepada empat bentuk, iaitu ekspresi suara, wajah, tingkah laku dan ekspresi lain. Maklumat seperti perubahan nada suara, raut wajah dan tingkah laku digunakan untuk mengukuhkan pentafsiran emosi marah, manakala bahasa dalam dialog kekal sebagai data utama. Penggunaan maklumat pengiring ini selaras dengan kajian yang menunjukkan bahawa pemaknaan emosi dapat dibantu oleh pelbagai sumber linguistik dan konteks yang mengiringinya (Dana et al., 2025; Hoemann et al., 2025).

Secara keseluruhannya, kerangka Hude (2006) menjadi asas untuk mengenal pasti rangsangan dan penilaian yang mencetuskan emosi marah. Kajian ini seterusnya meneliti hubungan antara rangsangan situasi, penilaian kognitif, strategi bahasa dan fungsi ujaran dalam konteks interaksi bagi menjelaskan pemaknaan emosi marah. Analisis tersebut turut menjadi asas untuk merumuskan pemikiran dan nilai sosial yang digambarkan melalui interaksi watak.

Kerangka teori yang digunakan dalam kajian ini diringkaskan dalam Rajah 1.

METODOLOGI

Kajian ini menggunakan pendekatan kualitatif dengan kaedah analisis kandungan. Analisis kandungan digunakan untuk mentafsir data teks secara sistematik melalui proses pengekodan serta pengenalpastian tema atau pola (Hsieh & Shannon, 2005). Sumber data ialah novel *Hari-hari Terakhir di Jesselton* karya Ruhaini Matdarin (2018) yang diterbitkan oleh Dewan Bahasa dan Pustaka pada tahun 2018. Unit analisis ialah dialog yang memaparkan emosi marah dalam konteks interaksi yang lengkap. Naratif pengiring turut dirujuk untuk



Rajah 1. Kerangka analisis bahasa emosi marah berdasarkan kerangka emosi Hude (2006)
Sumber: Olahan pengkaji

memperoleh maklumat tentang penutur, lawan tutur, situasi komunikasi, nada suara, ekspresi wajah dan tingkah laku watak. Naratif digunakan sebagai maklumat sokongan, manakala bahasa dalam dialog menjadi data utama. NVivo digunakan untuk mengurus dan menyusun data secara sistematik (Allsop et al., 2022). Pengekodan dan pentafsiran pula dilakukan oleh pengkaji berdasarkan kerangka Hude (2006) dan konteks interaksi.

Persampelan Kajian

Kajian ini menggunakan persampelan bertujuan berdasarkan kriteria yang selaras dengan fokus kajian (Stratton, 2024). Keseluruhan novel diteliti untuk mengenal pasti dialog yang memaparkan emosi marah. Pemilihan data dibuat berdasarkan empat kriteria. Pertama, dialog menunjukkan emosi marah berdasarkan kerangka Hude (2006). Kedua, kemarahan dapat dikenal pasti melalui bahasa dan konteks yang mengiringinya. Ketiga, terdapat rangsangan yang mencetuskan kemarahan. Keempat, penutur, lawan tutur dan situasi interaksi dapat dikenal pasti dengan jelas. Bentuk bahasa seperti makian, sindiran, arahan, penegasan, teguran dan soalan retorik digunakan sebagai petunjuk apabila hadir, tetapi bukan sebagai penentu utama emosi marah. Semua dialog yang memenuhi keempat-empat kriteria dimasukkan tanpa mengehadkan watak, bab atau kedudukan dialog dalam novel. Dialog yang tidak memenuhi kriteria pula dikecualikan. Proses ini menghasilkan 91 dialog yang merupakan keseluruhan data emosi marah yang memenuhi kriteria kajian.

Pengumpulan dan Penganalisisan Data

Pengumpulan data dilakukan melalui pembacaan berulang-ulang terhadap keseluruhan novel. Dialog yang berpotensi mengandungi emosi marah dikenal pasti dan disaring berdasarkan kriteria pemilihan. Setiap dialog yang memenuhi kriteria direkodkan bersama maklumat bab,

halaman, penutur, lawan tutur dan konteks situasi. Dialog tersebut diberikan kod DEM (Data Emosi Marah) dan dimasukkan ke dalam NVivo.

Analisis dilakukan secara berperingkat. Pertama, dialog diteliti bersama naratif pengiring untuk mengesahkan emosi marah berdasarkan bahasa dan konteks. Kedua, peristiwa atau keadaan yang mencetuskan kemarahan dikenal pasti sebagai rangsangan dan diikuti dengan penelitian terhadap penilaian kognitif watak. Ketiga, strategi bahasa yang digunakan untuk mengekspresikan kemarahan dikenal pasti dan ditafsirkan berdasarkan konteks interaksi, termasuklah hubungan antara penutur dengan lawan tutur. Maklumat tentang suara, wajah dan tingkah laku dalam naratif digunakan sebagai sokongan kepada pentafsiran. Keempat, data membentuk tiga tema berdasarkan rangsangan dan penilaian kognitif, iaitu ancaman terhadap kuasa dan maruah, keinginan yang tidak tercapai dan penilaian terhadap kebatilan. Kelima, fungsi ujaran ditafsirkan berdasarkan tujuan penggunaan bahasa dan konteks interaksi. Proses ini membolehkan pemaknaan emosi marah dianalisis melalui hubungan antara rangsangan situasi, penilaian kognitif, strategi bahasa dan fungsi ujaran.

Sekiranya sesuatu data memenuhi kriteria lebih daripada satu tema, pengelompokan ditentukan berdasarkan rangsangan dan penilaian kognitif yang paling dominan. Tema dominan merujuk kepada perkara utama yang dinilai oleh watak sebagai punca kemarahannya berdasarkan keseluruhan konteks interaksi. Taburan data bagi setiap tema kemudiannya dihitung secara deskriptif untuk menunjukkan pola kemunculan tema.

Untuk memastikan ketekalan analisis, pengekodan semula dilakukan dalam NVivo selepas selang beberapa minggu daripada pengekodan awal. Prosedur ini digunakan untuk menilai ketekalan pengelompokan data oleh pengkaji pada dua tempoh yang berbeza (Aly et al., 2024; Mukhalalati & Taylor, 2020). Sebarang perbezaan dalam pengelompokan atau pentafsiran data diteliti semula dengan merujuk takrif dan kriteria bagi setiap tema, rangsangan situasi, penilaian kognitif, serta konteks interaksi. Pengekodan dan pentafsiran data turut dibincangkan bersama penyelia sebagai langkah tambahan untuk menilai kesesuaian pengelompokan tema dan meningkatkan ketekalan analisis (Aly et al., 2024).

ANALISIS DAN PERBINCANGAN

Analisis terhadap 91 dialog menunjukkan bahawa pemaknaan emosi marah tidak bergantung pada kata yang secara eksplisit menandai kemarahan. Sebaliknya, makna emosi terbentuk melalui hubungan antara rangsangan situasi, penilaian kognitif watak, strategi bahasa dan konteks interaksi. Naratif pengiring yang menggambarkan ekspresi suara, wajah, dan tingkah laku digunakan sebagai maklumat sokongan untuk mengukuhkan pentafsiran emosi serta menjelaskan intensiti kemarahan watak. Berdasarkan kerangka Hude (2006), analisis data menghasilkan tiga tema, iaitu marah sebagai reaksi terhadap ancaman terhadap kuasa dan maruah, marah akibat keinginan

yang tidak tercapai serta marah sebagai penilaian terhadap kebatilan.

Pengelompokan dibuat berdasarkan rangsangan dan penilaian kognitif yang paling dominan dalam konteks sesuatu dialog. Sekiranya sesuatu dialog mengandungi lebih daripada satu kemungkinan pencetus, tema ditentukan berdasarkan perkara utama yang dinilai oleh watak sebagai punca kemarahannya. Penilaian tersebut boleh melibatkan ancaman terhadap kuasa atau maruah, halangan terhadap keinginan atau matlamat, ataupun tindakan yang dianggap bertentangan dengan kebenaran dan keadilan. Penentuan ini penting kerana sesuatu situasi boleh mengandungi lebih daripada satu kemungkinan pencetus emosi. Taburan data ditunjukkan dalam Jadual 1.

Jadual 1 menunjukkan bahawa ancaman terhadap kuasa dan maruah merupakan tema paling dominan dengan 41 dialog (45%), diikuti oleh keinginan yang tidak tercapai sebanyak 26 dialog (29%) dan penilaian terhadap kebatilan sebanyak 24 dialog (26%). Taburan ini menunjukkan bahawa kemarahan paling banyak muncul apabila watak menilai sesuatu peristiwa sebagai ancaman terhadap kedudukan, autoriti, pengiktirafan atau harga diri. Ketiga-tiga tema ini turut menjelaskan bahawa emosi marah terbentuk berdasarkan cara watak menilai kesan sesuatu peristiwa terhadap kedudukan, matlamat dan nilai yang dipegang sebelum emosi tersebut diekspresikan melalui strategi bahasa tertentu.

Marah sebagai Reaksi terhadap Ancaman Kuasa dan Maruah

Tema ini merangkumi kemarahan yang tercetus apabila sesuatu tindakan dinilai sebagai ancaman terhadap autoriti, kedudukan, kawalan, pengiktirafan atau harga diri watak. Ancaman terhadap kuasa berlaku apabila watak yang mempunyai hak untuk memberikan arahan dan mengawal pihak lain berasa kedudukannya tercabar. Sementara itu, ancaman terhadap maruah berlaku apabila watak dihina, tidak diberikan pengiktirafan atau reputasinya tercemar. Analisis menunjukkan bahawa kemarahan dalam tema ini ditunjukkan melalui makian, arahan, penegasan kedudukan, soalan retorik, sindiran dan amaran. Walau bagaimanapun, penggunaan strategi tersebut berbeza mengikut jenis ancaman dan hubungan sosial antara penutur dengan lawan tutur.

Jadual 1
Taburan data mengikut tema pemaknaan emosi marah

Tema Makna Emosi Marah	Jumlah Data (dialog)	Peratus (%)
Marah sebagai reaksi terhadap ancaman kuasa dan maruah	41	45
Marah akibat keinginan yang tidak tercapai	26	29
Marah sebagai penilaian terhadap kebatilan	24	26
Jumlah	91	100.0

Sumber: Data kajian pengkaji

Contohnya, dalam DEM17 yang berikut:

> Setan! Kau mahu beritahu aku atau tidak? Aku ini tuan kau! Orang yang beri kau makan dan pakai. Beraninya kau mengulun tuan sendiri? Sikap apa ini?
>
> (12:141)

Dialog tersebut diujarkan oleh Sharif Hamid kepada Awang Ruskap dengan nada suara tinggi, jeritan dan makian. Sebelum ujaran tersebut, Awang Ruskap meminta Sharif Hamid berjanji untuk bertenang kerana bimbang akan terus diperlakukan secara kasar. Permintaan tersebut ditafsir oleh Sharif Hamid sebagai tindakan orang bawahan yang cuba menetapkan syarat dan mengawal tingkah lakunya. Penilaian tersebut turut dipengaruhi oleh rasa curiga terhadap Awang Ruskap yang berkemungkinan menyembunyikan maklumat dan mempunyai rancangan bersama Razak.

Berdasarkan kerangka Hude (2006), permintaan Awang Ruskap merupakan rangsangan yang dinilai sebagai sikap orang bawahan yang tidak patuh dan percubaan untuk mengkhianatinya, sekali gus mencabar kedudukan Sharif Hamid sebagai majikan. Penilaian tersebut dipengaruhi oleh kepercayaan bahawa orang bawahan perlu menunjukkan kesetiaan serta mematuhi arahan pihak yang lebih berkuasa. Oleh itu, kemarahan Sharif Hamid berpunca daripada kegagalannya memperoleh maklumat dan tanggapan bahawa hierarki antara majikan dengan orang bawahan telah dilanggar.

Penilaian terhadap ancaman tersebut kemudiannya ditunjukkan melalui beberapa strategi bahasa. Makian "setan" memberikan penilaian negatif terhadap lawan tutur dan meningkatkan ketegasan ujaran. Menurut *Kamus Dewan Perdana* (2021), syaitan merujuk makhluk jahat yang mempunyai sifat buruk, manakala "setan" turut digunakan sebagai kata makian ketika seseorang berasa sangat marah. Dalam konteks ini, Awang Ruskap bukan sahaja dianggap tidak memberikan kerjasama, tetapi turut dinilai sebagai pihak yang tidak setia dan boleh mengancam kepentingan penutur. Makian berbentuk pelabelan ini digunakan untuk menunjukkan bahawa penutur benar-benar marah dan menganggap lawan tutur sebagai individu yang jahat, di samping mempertahankan kedudukannya. Pengulangan kata ganti nama "kau" menunjukkan kecaman yang ditujukan secara langsung kepada Awang Ruskap. Ujaran "Aku ini tuan kau!" pula digunakan untuk menegaskan perbezaan status antara dirinya dengan lawan tutur. Hal ini diperkukuh melalui ujaran "Orang yang beri kau makan dan pakai", yang digunakan untuk menuntut ketaatan dan kesetiaan Awang Ruskap.

Seterusnya, tiga soalan retorik yang digunakan secara berturut-turut berfungsi untuk mengekspresikan kemarahan penutur. Soalan "Kau mahu beritahu aku atau tidak?" berfungsi sebagai desakan untuk memperoleh maklumat, manakala "Beraninya kau *mengulun* tuan sendiri?" berfungsi sebagai kecaman terhadap tindakan yang dianggap melanggar hierarki. Berdasarkan glosari novel, "mengulun" bermaksud mengarah-arah. Hal ini menjelaskan bahawa kemarahan

penutur berpunca daripada kedudukannya sebagai majikan yang tercabar apabila orang bawahannya tidak segera mematuhi kehendaknya, malah cuba memberikan arahan kepadanya. Soalan "Sikap apa ini?" pula memberikan penilaian negatif terhadap keseluruhan tingkah laku Awang Ruskap. Oleh itu, penggunaan makian, penegasan kedudukan dan soalan retorik dalam DEM17 menunjukkan kemarahan Sharif Hamid terhadap Awang Ruskap, di samping menegaskan kedudukannya sebagai majikan dan menuntut kepatuhan daripada orang bawahannya.

Pola yang hampir sama dapat diperhatikan dalam DEM18 dan DEM76. Dalam DEM18, makian "bahlul!" dan pertanyaan "Kau bekerja untuk siapa, setan!" digunakan ketika Sharif Hamid mahu mengingatkan Awang Ruskap tentang kedudukannya sebagai orang bawahan dan memintanya mematuhi arahan. Dalam DEM76 pula, soalan "Siapa bekerja untuk siapa?" diujarkan oleh Sharif Hamid kepada Awang Ruskap untuk menegaskan bahawa hak memberikan arahan ditentukan oleh kedudukan mereka dalam hierarki pekerjaan. Ujaran "Satu usaha untuk menyingkirkan aku ke tepi jalan" dalam DEM18 menunjukkan bahawa kemarahan bukan hanya berkaitan dengan ketidakpatuhan orang bawahan, tetapi juga kebimbangan terhadap kemungkinan kehilangan kuasa dan kedudukan. Perbandingan ini menunjukkan bahawa apabila watak merasakan autoritinya tercabar, bahasa marah akan digunakan untuk menegaskan kedudukan penutur dan menuntut kepatuhan daripada lawan tutur.

Ancaman terhadap maruah pula menunjukkan pola yang sedikit berbeza. Dalam DEM79, Sharif Hamid mengujarkan "Siapa suruh kau beritahu ayah aku?" dan "Kau memang celaka!" kepada Daiman selepas ayahnya mengetahui tentang pembelian rantai emas tersebut. Sharif Hamid menganggap tindakan Daiman sebagai satu pengkhianatan yang boleh menjejaskan reputasinya. Dalam konteks ini, soalan retorik dan makian digunakan untuk mengecam Daiman kerana mendedahkan perkara yang ingin dirahsiakannya. Tindakan Sharif Hamid mengayunkan penumbuk ke muka Daiman turut menunjukkan kemarahan yang semakin kuat apabila reputasinya dirasakan terancam.

DEM39 menunjukkan satu lagi bentuk ancaman terhadap maruah, iaitu watak Sharif Malik marah apabila statusnya sebagai anak tidak sah taraf menyebabkan dirinya tidak mendapat pengiktirafan daripada ayah kandungnya. Soalan retorik "Tahukah kau betapa menderitanya aku selama ini" menyuarakan penderitaan yang telah lama dipendam, manakala ujaran "usahamu selalu berhasil menjauhkan aku" meletakkan lawan tutur sebagai pihak yang dianggap menghalang dirinya daripada memperoleh pengiktirafan. Berbeza daripada DEM17, DEM18 dan DEM76 yang menonjolkan usaha menegaskan autoriti, kemarahan dalam DEM39 berfungsi untuk menuntut pengiktirafan serta mempertahankan identiti dan harga diri.

Analisis silang data ini menunjukkan bahawa strategi bahasa kemarahan berbeza mengikut bentuk ancaman yang

dirasakan oleh watak. Apabila ancaman melibatkan kuasa dan kedudukan, seperti dalam DEM17, DEM18 dan DEM76, kemarahan ditunjukkan melalui makian, penegasan status dan soalan retorik untuk menegaskan kuasa serta menuntut kepatuhan daripada lawan tutur. Sebaliknya, apabila ancaman berkaitan reputasi dan pengiktirafan diri seperti dalam DEM79 dan DEM39, bahasa marah berfungsi untuk mengecam pengkhianatan, mempertahankan harga diri dan menuntut pengiktirafan. Secara keseluruhannya, hubungan antara rangsangan, penilaian kognitif dan strategi bahasa menunjukkan bahawa penggunaan bahasa marah berbeza mengikut jenis ancaman dan kedudukan penutur dalam hubungan sosial.

Dapatan ini mempunyai persamaan dengan Park et al. (2013), yang menghubungkan ekspresi marah dengan status dan dominasi sosial, serta Van Kleef dan Lange (2020), yang menunjukkan bahawa kedudukan sosial mempengaruhi cara individu mengekspresikan kemarahan. Walau bagaimanapun, analisis kajian ini memperincikan hubungan tersebut pada tahap bahasa dengan menunjukkan bahawa jenis ancaman menghasilkan fungsi bahasa marah yang berbeza. Ancaman terhadap autoriti mendorong penggunaan strategi yang menegaskan hierarki dan menuntut kepatuhan, manakala ancaman terhadap maruah dan pengiktirafan mendorong penggunaan bahasa untuk mempertahankan harga diri dan menuntut pengiktirafan. Dapatan berkaitan penafian pengiktirafan pula mempunyai persamaan dengan Zhang et al. (2025), yang menghubungkan kemarahan dengan usaha mempertahankan kedudukan dan maruah diri.

Dari sudut pemikiran dan nilai yang digambarkan dalam teks, tema ini menunjukkan bahawa hubungan antara pihak atasan dengan orang bawahan menuntut rasa patuh dan hormat terhadap autoriti. Namun, kuasa tidak seharusnya digunakan untuk menghina, mengugut atau melakukan kekerasan terhadap orang bawahan. Data tentang reputasi dan pengiktirafan pula menunjukkan bahawa watak berusaha mempertahankan harga diri apabila kedudukan atau identitinya dinafikan. Setiap individu, tanpa mengira kedudukannya, mempunyai maruah dan mengharapkan pengiktirafan daripada orang lain. Dari sudut nilai sosial, tema ini menonjolkan nilai hormat, kepatuhan, maruah, pengiktirafan, kesantunan dan kawalan emosi. Oleh itu, bahasa marah dalam tema ini digunakan untuk mempertahankan kuasa dan kedudukan serta melindungi maruah diri.

Marah Akibat Keinginan yang Tidak Tercapai

Tema ini merangkumi emosi marah yang timbul apabila sesuatu peristiwa tidak menepati keinginan, harapan, rancangan atau matlamat watak. Keadaan tersebut dinilai secara negatif kerana menghalang hasil yang ingin dicapai atau menjejaskan kepentingan watak. Dalam data yang dianalisis, kemarahan dalam tema ini ditunjukkan melalui soalan retorik, sindiran, kecaman, arahan dan penilaian negatif

terhadap tindakan lawan tutur. Strategi bahasa yang digunakan berbeza mengikut matlamat watak dan pihak yang dianggap menghalang matlamat tersebut.

Hal ini dapat dilihat dalam DEM03 yang berikut:

> Kau sudah hilang akalkah? Apa yang kaufikirkan?
>
> (10:121)

Dialog tersebut diujarkan oleh Miss Tijah kepada Razak selepas persembahan mereka tidak berjalan seperti yang dirancang. Razak telah merombak jalan cerita secara drastik sehingga persembahan menjadi celaru. Naratif yang mengiringi dialog menggambarkan Miss Tijah bersuara tinggi, berwajah masam mencuka dan melepaskan kemarahannya di hadapan semua anak wayang. Maklumat ini menjelaskan bahawa kedua-dua soalan tersebut tidak diujarkan sebagai pertanyaan biasa, tetapi sebagai ekspresi marah.

Berdasarkan kerangka Hude (2006), tindakan Razak mengubah jalan cerita sehingga persembahan menjadi celaru menjadi rangsangan kepada emosi marah Miss Tijah. Tindakan tersebut dinilai sebagai sesuatu yang menjejaskan perancangan, usaha dan kelancaran persembahan. Penilaian ini dipengaruhi oleh harapannya agar persembahan berjalan dengan teratur serta rasa tanggungjawabnya terhadap kelab. Perbezaan antara hasil yang diharapkan dengan keadaan sebenar menyebabkan Razak dianggap sebagai pihak yang menggagalkan perancangan tersebut, lalu mencetuskan kemarahan Miss Tijah.

Penilaian tersebut kemudiannya ditunjukkan melalui dua soalan retorik yang diujarkan secara berturutan. Soalan "Kau sudah hilang akalkah?" digunakan untuk mengecam tindakan Razak yang dianggap tidak rasional dan dilakukan tanpa mempertimbangkan kesannya terhadap persembahan. Soalan "Apa yang kaufikirkan?" pula mempersoalkan pertimbangannya ketika membuat keputusan tersebut. Kedua-dua soalan ini menunjukkan penolakan Miss Tijah terhadap tindakan Razak serta meletakkannya sebagai pihak yang bertanggungjawab terhadap kegagalan persembahan. Penggunaan kata ganti nama "kau" pula perlu ditafsir berdasarkan hubungan kekeluargaan antara Miss Tijah dengan Razak. Kata ganti nama tersebut pada asalnya menunjukkan hubungan yang rapat dan tidak formal. Namun, apabila digunakan bersama-sama soalan retorik serta diujarkan dengan suara tinggi dan wajah masam mencuka, kecaman Miss Tijah terhadap Razak menjadi lebih langsung dan tegas. Hal ini menunjukkan bahawa penggunaan sesuatu bentuk bahasa dalam mengekspresikan kemarahan turut dipengaruhi oleh konteks interaksi dan hubungan antara watak.

Makna emosi marah ini turut dikukuhkan melalui DEM04, iaitu:

> Dan kerana itulah kau merombak jalan cerita lalu menjadikan cerita yang sudah berminggu-minggu kita rancang menjadi kucar-kacir sebentar tadi?
>
> (10:122)

Soalan retorik ini meneruskan kecaman Miss Tijah terhadap tindakan Razak.

Leksis "kucar-kacir" menggambarkan hasil persembahan yang bertentangan dengan keadaan teratur yang diharapkan, manakala frasa "sudah berminggu-minggu kita rancang" menekankan usaha dan komitmen bersama yang dianggap telah disia-siakan. Penggunaan kata ganti nama "kau" meletakkan Razak sebagai pihak yang dipersalahkan, manakala kata ganti nama "kita" menunjukkan bahawa perancangan tersebut melibatkan usaha bersama. Perbandingan DEM03 dan DEM04 menunjukkan bahawa apabila matlamat bersama terjejas akibat tindakan seseorang, bahasa marah digunakan untuk mengecam tindakan tersebut dan meletakkan tanggungjawab terhadap pihak yang dianggap telah menjadi puncanya.

Pola yang berbeza-beza dapat dilihat apabila keinginan yang tidak tercapai melibatkan usaha penutur untuk mendapatkan pemahaman atau penerimaan daripada lawan tutur. Dalam DEM44, Razak menggunakan soalan retorik dan leksis "degil" apabila Miss Tijah enggan mendengar penjelasannya tentang rancangan untuk melarikan diri. Leksis "degil" menunjukkan penilaian negatif terhadap Miss Tijah yang enggan menerima pandangannya. Dalam DEM47 pula, pengulangan kata "faham" dalam soalan "Kau tak faham-faham lagi?" menunjukkan rasa geram Razak apabila Leman masih tidak memahami rancangan yang cuba dijelaskannya. Kedua-dua data menunjukkan bahawa apabila keinginan untuk didengar atau difahami tidak tercapai, bahasa marah digunakan untuk memberikan penilaian negatif dan mendesak lawan tutur supaya menerima atau memahami penjelasan penutur.

Dalam DEM46 pula, emosi marah Razak tercetus apabila usahanya untuk memajukan kelab tidak mencapai hasil yang diharapkan, malah dia dipersalahkan atas kegagalan tersebut. Frasa "mencuba nasib supaya kelab kita boleh pergi jauh" menunjukkan matlamat yang ingin dicapai, manakala soalan "Kau salahkan aku" menunjukkan penolakannya terhadap tuduhan Miss Tijah. Penggunaan kata nafi dalam "tidak tahu" dan "tidak tahu-menahu" pula digunakan untuk menafikan penglibatannya serta mempertahankan diri daripada tuduhan tersebut. Naratif yang menggambarkan Razak menjerit sehingga urat-urat di lehernya kelihatan turut menguatkan pentafsiran terhadap kemarahannya. Data ini menunjukkan bahawa apabila kegagalan mencapai matlamat disertai dengan tuduhan terhadap penutur, bahasa marah turut digunakan untuk menafikan tuduhan dan mempertahankan diri.

Analisis silang data menunjukkan bahawa penggunaan bahasa marah dalam tema ini berbeza mengikut keinginan atau matlamat yang tidak tercapai. Dalam DEM03 dan DEM04, kegagalan melibatkan perancangan dan hasil kerja bersama, lalu soalan retorik dan penilaian negatif digunakan untuk mengecam tindakan serta menyalahkan pihak yang dianggap menjadi punca kegagalan tersebut. Dalam DEM44 dan DEM47 pula, kemarahan timbul apabila penutur gagal mendapatkan pemahaman daripada lawan tutur. Bahasa marah digunakan untuk mendesak dan

memberikan penilaian negatif terhadap lawan tutur. DEM46 menunjukkan pola yang berbeza apabila kegagalan mencapai matlamat disertai dengan tuduhan terhadap penutur. Dalam keadaan ini, bahasa marah digunakan untuk menafikan tuduhan dan mempertahankan diri.

Secara keseluruhannya, perbezaan tersebut menunjukkan bahawa bahasa marah digunakan mengikut keadaan yang mencetuskan kekecewaan, sama ada untuk mengecam, mendesak atau mempertahankan diri. Hal ini menjelaskan bahawa fungsi bahasa marah dalam interaksi berubah mengikut bentuk halangan terhadap matlamat yang dinilai oleh penutur. Dapatan ini mempunyai persamaan dengan Breuer dan Elson (2017), yang menjelaskan bahawa kekecewaan boleh berlaku apabila matlamat atau jangkaan individu tidak tercapai dan seterusnya mencetuskan kemarahan. Walau bagaimanapun, analisis kajian ini menunjukkan bahawa kegagalan mencapai matlamat tidak menghasilkan penggunaan bahasa marah yang seragam. Sebaliknya, strategi bahasa dan fungsi ujaran marah dalam interaksi berubah mengikut bentuk halangan yang dihadapi oleh penutur. Kegagalan dalam perancangan bersama mencetuskan kecaman dan tuntutan agar pihak yang dianggap menjadi puncanya bertanggungjawab. Kegagalan untuk difahami pula mendorong desakan dan penilaian negatif terhadap lawan tutur, manakala tuduhan terhadap penutur sebagai punca kegagalan mendorong penafian dan usaha mempertahankan diri.

Dari sudut pemikiran dan nilai yang digambarkan dalam teks, tema ini menunjukkan bahawa pencapaian sesuatu matlamat memerlukan perancangan, kerjasama dan tanggungjawab. Keputusan yang melibatkan kepentingan bersama juga perlu mengambil kira pandangan pihak yang terlibat. Konflik boleh berlaku apabila tindakan seseorang menjejaskan perancangan bersama-sama atau apabila pandangan dan penjelasan tidak didengar serta difahami. Hal ini mempunyai persamaan dengan Mohamad Mokhtar Abu Hassan (2024), yang menjelaskan bahawa konflik dan kurangnya kerjasama menyebabkan Kelab Bangsawan Seri Melati tidak dapat diurus dengan baik serta gagal mencapai matlamatnya. Dari sudut nilai sosial, tema ini menonjolkan nilai tanggungjawab, kerjasama, saling menghormati, kesediaan mendengar pandangan, kesabaran dan kawalan emosi. Oleh itu, bahasa marah dalam tema ini menunjukkan reaksi watak apabila sesuatu matlamat tidak tercapai, seperti meluahkan rasa tidak puas hati, meminta dirinya difahami dan mempertahankan diri.

Marah sebagai Penilaian terhadap Kebatilan

Tema ini merangkumi emosi marah yang tercetus apabila sesuatu tindakan dinilai bertentangan dengan kebenaran, keadilan dan nilai moral yang dipegang oleh watak. Dalam data yang dianalisis, kebatilan melibatkan eksploitasi, penyalahgunaan kuasa, layanan tidak adil, pencabulan maruah dan tindakan yang melanggar norma sosial. Emosi marah dalam tema ini ditunjukkan melalui ayat bersyarat, bahasa tersirat, sindiran, soalan retorik, arahan dan

amaran. Strategi bahasa yang digunakan berbeza mengikut bentuk kebatilan yang dinilai serta pihak yang menjadi sasaran kemarahan.

Contohnya, dalam DEM51:

> Sekiranya saya bagus dan bakal pelabur menyukai persembahan kelab kami, maka baguslah. Tapi, sekiranya tidak memuaskan hati bakal pelabur, tidak perlulah dilanjutkan sampai ke ranjang kerana saya percaya di luar sana pasti ada pelabur yang akan menghargai bakat anak seni seperti saya tanpa perlu meminta sesuatu yang melibatkan maruah seorang wanita.
>
> (3:37)

Sebelum DEM51 diujarkan, Daiman terlebih dahulu memaklumkan bahawa bakal pelabur mempunyai "permintaan istimewa" terhadap Miss Tijah. Maklumat tersebut menjadi rangsangan yang mencetuskan kemarahannya. Berdasarkan pengalaman menghadapi situasi yang sama sebelum ini, Miss Tijah mengesyaki bahawa permintaan tersebut merujuk kepada permintaan seksual. Walaupun Daiman belum menjelaskan maksud sebenar permintaan itu, Miss Tijah telah menilainya sebagai cubaan mengeksploitasi dirinya dan mencabul maruahnya sebagai seorang wanita.

Berdasarkan kerangka Hude (2006), penilaian tersebut dipengaruhi oleh pengalaman terdahulu serta kepercayaan Miss Tijah bahawa kejayaan seorang anak seni seharusnya dinilai berdasarkan bakat dan mutu persembahan, bukannya dengan memenuhi kehendak seksual pihak tertentu. Oleh itu, permintaan tersebut dinilai sebagai tindakan yang tidak bermoral dan menjatuhkan maruah, lalu mencetuskan kemarahannya.

Walaupun mengandungi emosi marah, DEM51 tidak disampaikan melalui makian atau jeritan. Sebaliknya, Miss Tijah menggunakan ayat bersyarat dan bahasa tersirat untuk menyatakan pendiriannya. Ujaran "Sekiranya saya bagus dan bakal pelabur menyukai persembahan kelab kami, maka baguslah" menunjukkan bahawa penajaan seharusnya berdasarkan bakat dan mutu persembahan. Jika persembahannya tidak memuaskan, dia sanggup menerima penolakan. Namun, dia menolak hubungan seksual sebagai syarat mendapatkan penajaan melalui ujaran "tidak perlulah dilanjutkan sampai ke ranjang". Ungkapan "sampai ke ranjang" merujuk hubungan seksual secara tersirat dan membolehkan penutur menyentuh perkara sensitif tanpa menggunakan kata yang terlalu langsung. Strategi ini menunjukkan bahawa kemarahan boleh disampaikan secara terkawal tetapi tetap tegas.

Frasa "tidak perlulah" menunjukkan penolakan terhadap permintaan yang dianggap tidak bermoral. Ujaran "saya percaya di luar sana pasti ada pelabur" pula menunjukkan keyakinan Miss Tijah bahawa pihak lain akan menghargai bakatnya tanpa mengenakan syarat yang menjatuhkan maruah. Penggunaan leksis "bakat" dan "anak seni" pula menegaskan identitinya sebagai penggiat seni yang mahu dinilai berdasarkan kebolehan, manakala leksis "maruah" dan "wanita" memperlihatkan

prinsip yang dipertahankannya. Oleh itu, bahasa marah dalam DEM51 berfungsi untuk menolak eksploitasi dan mempertahankan maruah tanpa menggunakan bahasa kasar.

Pola penolakan terhadap eksploitasi turut ditemukan dalam DEM57 dan DEM59, tetapi dipaparkan melalui strategi bahasa yang berbeza. Dalam DEM57, Miss Tijah menggunakan sindiran "Bagi kalian, semuanya atas nama perniagaan" untuk mengkritik pihak yang dianggap menggunakan kepentingan perniagaan sebagai alasan bagi membenarkan tindakan yang bertentangan prinsipnya. Kata ganti nama "kalian" memperluas sasaran kritikan kepada pihak yang terlibat dalam tindakan tersebut. Dalam DEM59 pula, kemarahan dinyatakan dengan lebih langsung melalui arahan "Diam!" dan amaran kepada Nadrah supaya tidak menggadaikan maruah demi mendapatkan penaja atau mengejar kemasyhuran. Jika DEM51 memperlihatkan penolakan secara terkawal melalui ayat bersyarat dan bahasa tersirat, DEM57 menggunakan sindiran untuk mengkritik, manakala DEM59 menggunakan arahan dan amaran untuk mencegah tindakan yang dianggap boleh menjatuhkan maruah.

Perbandingan DEM51, DEM57 dan DEM59 menunjukkan bahawa penilaian terhadap eksploitasi menghasilkan strategi bahasa yang berbeza-beza. DEM51 menggunakan bahasa terkawal dan tersirat untuk menolak, DEM57 menggunakan sindiran untuk mengkritik, manakala DEM59 menggunakan arahan dan amaran untuk memberikan peringatan. Perbezaan ini dipengaruhi oleh hubungan antara penutur dengan lawan tutur serta tujuan kemarahan disampaikan. Dapatan ini mempunyai persamaan dengan Lizarazo Pereira et al. (2022) yang menjelaskan bahawa persepsi terhadap ketidakadilan boleh mencetuskan emosi marah. Namun begitu, analisis kajian ini menunjukkan bahawa penilaian terhadap pelanggaran nilai tidak menggunakan bahasa marah yang sama. Perbezaannya dapat dilihat pada cara kemarahan disampaikan mengikut sasaran dan tujuan penutur, sama ada untuk menolak, mengkritik, memberikan arahan atau memberi amaran.

Penilaian terhadap kebatilan turut melibatkan ketidakadilan sosial dan ekonomi. Dalam DEM61, ibu Awang Ruskap mempersoalkan hubungan yang dianggap sebagai persaudaraan kerana anaknya tidak menerima upah yang setimpal dengan pekerjaannya. Perbandingan "bekerja macam tikus siang malam" menggambarkan beban kerja yang berat, manakala persoalan tentang perbezaan upah menunjukkan layanan tidak adil yang diterima oleh anaknya. Dalam DEM62 pula, beliau mempersoalkan kehilangan tanah keluarga atas nama kebaikan yang sebenarnya menguntungkan pihak lain. Berbeza daripada DEM51, DEM57 dan DEM59 yang berkaitan dengan eksploitasi dan maruah wanita, DEM61 dan DEM62 menunjukkan kemarahan terhadap tindakan yang dinilai menafikan hak dan mengambil kesempatan terhadap pihak lain.

Analisis silang data menunjukkan bahawa bahasa marah dalam tema ini berubah mengikut bentuk kebatilan dan

tujuan penutur. Apabila kebatilan melibatkan eksploitasi dan pencabulan maruah, bahasa marah digunakan untuk menolak permintaan, mengkritik tindakan dan memberikan peringatan bagi mempertahankan maruah. Apabila kebatilan melibatkan ketidakadilan sosial dan ekonomi, bahasa marah digunakan untuk mempersoalkan layanan tidak adil dan menuntut hak pihak yang terjejas. Perbezaan tersebut menunjukkan bahawa bahasa marah dalam tema ini bukan sekadar ekspresi tidak puas hati, tetapi digunakan untuk menyatakan pendirian terhadap tindakan yang dinilai bertentangan dengan prinsip, maruah dan keadilan.

Secara keseluruhannya, dapatan ini selaras dengan Hude (2006), iaitu emosi marah boleh menjadi bentuk penolakan terhadap kebatilan dan penolakan tersebut dapat dinyatakan melalui penggunaan bahasa. Kebatilan dalam data melibatkan eksploitasi dan pencabulan maruah wanita serta ketidakadilan sosial dan ekonomi. Penilaian terhadap tindakan tersebut menghasilkan strategi bahasa yang berbeza, seperti ayat bersyarat, bahasa tersirat, sindiran, soalan retorik, arahan dan amaran. Penggunaannya pula bergantung pada bentuk tindakan yang dinilai salah, hubungan antara watak dan tujuan kemarahan disampaikan. Dengan demikian, bahasa marah bukan sahaja menunjukkan keadaan emosi watak, tetapi turut digunakan untuk menolak tindakan, mempertahankan prinsip, memberikan peringatan dan mempersoalkan ketidakadilan.

Dari sudut pemikiran dan nilai yang digambarkan dalam teks, tema ini menekankan kepentingan menjaga maruah, berlaku adil dan menghormati hak orang lain. Bakat dan mutu kerja perlu dihargai tanpa mengambil kesempatan terhadap seseorang demi kepentingan tertentu. Oleh itu, bahasa marah dalam tema ini digunakan untuk menolak eksploitasi dan ketidakadilan serta mempertahankan prinsip yang dipegang oleh watak.

KESIMPULAN

Kajian ini menunjukkan bahawa makna emosi marah tidak hanya dikenal pasti melalui kata-kata yang menandai kemarahan secara langsung. Sebaliknya, pemaknaan emosi marah terbentuk melalui hubungan antara rangsangan situasi, penilaian kognitif watak, penggunaan bahasa dan konteks interaksi. Naratif yang menggambarkan suara, wajah dan tingkah laku watak turut berfungsi sebagai maklumat sokongan bagi mengukuhkan pentafsiran terhadap makna dan intensiti kemarahan.

Analisis terhadap 91 dialog menghasilkan tiga tema utama berdasarkan kerangka Hude (2006), iaitu marah sebagai reaksi terhadap ancaman kuasa dan maruah, marah akibat keinginan yang tidak tercapai serta marah sebagai penilaian terhadap kebatilan. Ancaman terhadap kuasa dan maruah merupakan tema yang paling dominan. Emosi marah diekspresikan melalui pelbagai strategi bahasa seperti soalan retorik, arahan, sindiran, penegasan, amaran dan makian. Dapatan menunjukkan bahawa kemarahan tidak semestinya disampaikan melalui bahasa kasar, tetapi juga boleh dinyatakan secara tersirat,

terkawal dan tegas mengikut situasi, hubungan antara watak dan tujuan ujaran.

Penelitian terhadap ketiga-tiga tema menunjukkan bahawa penggunaan bahasa marah berbeza mengikut penilaian watak terhadap situasi yang dihadapi. Apabila autoriti dicabar, bahasa marah digunakan untuk menegaskan kedudukan dan menuntut kepatuhan. Apabila maruah terjejas, bahasa marah digunakan untuk mempertahankan harga diri dan mendapatkan pengiktirafan. Kegagalan mencapai matlamat pula mendorong penggunaan bahasa untuk mengecam, mendesak atau mempertahankan diri. Tindakan yang dinilai salah atau tidak adil pula mendorong penggunaan bahasa untuk menolak, mengkritik, memberikan peringatan dan menuntut keadilan. Dapatan ini memperluas penerapan kerangka Hude (2006) dengan menunjukkan bahawa perbezaan rangsangan dan penilaian kognitif berkait dengan perbezaan strategi bahasa dan fungsi ujaran dalam mengekspresikan kemarahan.

Keseluruhannya, bahasa emosi marah dalam novel yang dikaji bukan sahaja menggambarkan keadaan emosi watak, tetapi turut menjadi medium untuk menyatakan pendirian terhadap kuasa, maruah, tanggungjawab dan keadilan. Melalui penggunaan bahasa marah, teks turut menggambarkan nilai hormat, tanggungjawab, kerjasama, kesantunan, kawalan emosi dan kepentingan menjaga maruah. Dari sudut implikasi, dapatan ini menunjukkan kepentingan menggabungkan rangsangan situasi, penilaian kognitif dan konteks interaksi dalam penelitian bahasa emosi, khususnya bagi menjelaskan makna emosi yang tidak dinyatakan secara langsung dalam teks.

IMPLIKASI KAJIAN

Kajian ini memperluas penggunaan kerangka emosi Hude (2006) dengan menunjukkan bahawa perbezaan rangsangan situasi dan penilaian kognitif berkait dengan pemilihan strategi bahasa serta fungsi ujaran yang berbeza dalam mengekspresikan kemarahan. Dapatan ini menunjukkan bahawa analisis emosi tidak memadai dengan mengenal pasti kata atau bentuk bahasa yang menunjukkan kemarahan, tetapi perlu mengambil kira penilaian watak, hubungan antara watak dan tujuan ujaran. Dari sudut metodologi, konteks interaksi dan naratif pengiring penting untuk membantu mentafsirkan emosi yang tidak dinyatakan secara langsung dalam dialog. Pendekatan ini dapat menjadi asas analisis bahasa emosi yang menghubungkan aspek kognitif dengan penggunaan bahasa dalam konteks interaksi.

CADANGAN KAJIAN LANJUTAN

Kajian lanjutan boleh meneliti dengan lebih khusus pengaruh hubungan sosial dan kedudukan penutur terhadap pemilihan strategi bahasa dan fungsi ujaran marah. Dapatan kajian ini menunjukkan bahawa strategi bahasa yang digunakan berbeza-beza mengikut jenis rangsangan, penilaian watak, hubungan antara penutur dengan lawan tutur serta tujuan ujaran. Oleh itu, penelitian terhadap hubungan kuasa, status dan keakraban antara penutur dalam karya atau korpus yang berbeza-beza dapat

menguji sama ada pola tersebut turut ditemukan dalam konteks interaksi yang lain.

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RUJUKAN

Allsop, D. B., Chelladurai, J. M., Kimball, E. R., Marks, L. D., & Hendricks, J. J. (2022). Qualitative methods with NVivo software: A practical guide for analyzing qualitative data. Psych, 4(2), 142-159. https://doi.org/10.3390/psych4020013

Aly, A., Hishari, O., Stewart, D., Awaisu, A., Elshami, S., & Mukhalalati, B. (2024). Exploring the perceptions of faculty members about research courses in undergraduate pharmacy curriculum: A qualitative study. PLOS ONE, 19(6), Article e0305946. https://doi.org/10.1371/journal.pone.0305946

Baños-Piñero, R., & Chaume, F. (2009). Prefabricated orality: A challenge in audiovisual translation. inTRAlinea. https://www.intralinea.org/specials/article/1714

Breuer, J., & Elson, M. (2017). Frustration–aggression theory. In P. Sturmey (Ed.), The Wiley handbook of violence and aggression (pp. 1-12). Wiley. https://doi.org/10.1002/9781119057574.whbva040

Dana, O., Zulfiya, K., Bakhtigul, S., Aisulu, T., Aigul, O., Nursulu, T., Makhazhanova, G., & Aigul, K. (2025). Psycholinguistic and cultural dimensions of emotion verbalization: Investigating the rationale behind word choice. Eurasian Journal of Applied Linguistics, 11(1), 202-216. https://files.eric.ed.gov/fulltext/EJ1474975.pdf

Hazira Ahmad Zaidi. (2025, October). Last days of Jesselton: Citra Borneo ke pentas antarabangsa. Berita Harian. https://www.bharian.com.my/rencana/sastera/2025/10/1454741/last-days-jesselton-citra-borneo-ke-pentas-antarabangsa

Hoemann, K., Lee, Y., Dussault, È., Devylder, S., Ungar, L. H., Geeraerts, D., & Mesquita, B. (2025). The construction of emotional meaning in language. Communications Psychology, 3, Article 99. https://doi.org/10.1038/s44271-025-00255-0

Hsieh, H.-F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. Qualitative Health Research, 15(9), 1277-1288. https://doi.org/10.1177/1049732305276687

Hude, M. D. (2006). Emosi: Penjelajahan religio-psikologis tentang emosi manusia di dalam Al-Quran. Penerbit Erlangga.

Kamus Dewan Perdana. (2021). Dewan Bahasa dan Pustaka.

Klinger, R., Kim, E., & Padó, S. (2020). Emotion analysis for literary studies: Corpus creation and computational modelling. In N. Reiter, A. Pichler, & J. Kuhn (Eds.), Reflektierte algorithmische Textanalyse: Interdisziplinäre(s) Arbeiten in der CRETA-Werkstatt (pp. 237-268). De Gruyter. https://doi.org/10.1515/9783110693973-011

Lindquist, K. A., MacCormack, J. K., & Shablack, H. (2015). The role of language in emotion: Predictions from psychological constructionism. Frontiers in Psychology, 6, Article 444. https://doi.org/10.3389/fpsyg.2015.00444

Lizarazo Pereira, D. M., Schubert, T. W., & Roth, J. (2022). Moved by social justice: The role of kama muta in collective action toward racial equality. Frontiers in Psychology, 13, Article 780615. https://doi.org/10.3389/fpsyg.2022.780615

Mohamad Mokhtar Abu Hassan. (2024). Pendekatan pengurusan dalam kerjaya. The International Journal of Arts, Culture & Heritage (iJACH), 12, 1-34. https://doi.org/10.62312/asw.ijach.12.1.2024

Mukhalalati, B. A., & Taylor, A. (2020). Examining the disconnect between communities of practice learning theory and educational practices in the PharmD program in Qatar. *American Journal of Pharmaceutical Education, 84*(9), 1198-1210. https://doi.org/10.5688/ajpe847515

Nani Sunarni. (2022). Kosakata emosi dalam cerpen "Mikan". *Jurnal Sastra Studi Ilmiah Sastra, 12*(1), 30-38. http://45.118.112.109/ojspasim/index.php/sastra/issue/view/79

Nor Hafuza Muhammad Arif, Maizura Osman, & Hasmidar Hassan. (2024). Manifestasi emosi melalui metafora api: Satu representasi pemikiran Melayu. *Jurnal Pengajian Melayu (JOMAS), 35*(1), 1-17. https://ejournal.um.edu.my/index.php/JOMAS/article/view/51752

Norazimah Zakaria, & Mazarul Hasan Mohamad Hanapi. (2020). Citra emosi wanita dalam cerpen dan rasa kepada khalayak. *International Journal of Social Science Research, 2*(1), 124-138. http://myjms.moe.gov.my/index.php/ijssr/article/view/8374

Nova, I. F., & Winarti, D. (2024). Ungkapan marah dalam Komunitas Marah-Marah di media sosial X (kajian sosio-pragmatik). *Diglosia: Jurnal Kajian Bahasa, Sastra, dan Pengajarannya, 7*(4), 749–-760. https://doi.org/10.30872/diglosia.v7i4.1124

Nurul Norasuwat Rosli, & Nordiana Hamzah. (2020). Analisis emosi marah pemimpin Melayu dahulu dalam *Hikayat Raja Pasai*. In *Budaya komunikasi dan teknologi: Cabaran masa depan serumpun* (pp. 25-29). Universiti Pendidikan Sultan Idris.

Nykänen, E., & Koivisto, A. (2016). Introduction: Approaches to fictional dialogue. *International Journal of Language and Literature, 5*(2), 1-14. https://doi.org/10.15462/ijll.v5i2.56

Park, J., Kitayama, S., Markus, H. R., Coe, C. L., Miyamoto, Y., Karasawa, M., Curhan, K. B., Love, G. D., Kawakami, N., Boylan, J. M., & Ryff, C. D. (2013). Social status and anger expression: The cultural moderation hypothesis. *Emotion, 13*(6), 1122-1131. https://doi.org/10.1037/a0034273

Parkinson, B. (2023). Cross-cultural calibration of words and emotions: Referential, constructionist, and pragmatic perspectives. *Emotion Review, 15*(4), 348-362. https://doi.org/10.1177/17540739231182680

Patil, U., Hanmante, S., Patil, S., & Shahade, A. K. (2026). Narrative dialogue dataset: Speaker and emotion annotated conversational corpus. *Scientific Data, 13*, Article 507. https://doi.org/10.1038/s41597-026-06891-3

Ruhaini Matdarin. (2018). *Hari-hari terakhir di Jesselton*. Dewan Bahasa dan Pustaka.

Sariban, S., Furqon, H., Babil, M. I. S., Retno, R. T., Nisa', C., & Putri, N. W. E. (2020). The anger of the main character in the *Perempuan Bersampur Merah* novel by Intan Adaru: A study of literary psychology. *Edulitics (Education, Literature, and Linguistics) Journal, 5*(2), 93-101. https://doi.org/10.52166/edulitics.v5i2.3398

Schultz-Palma, M. (1996). The language of anger. *MEXTESOL Journal, 19*(4), 27-35. https://mail.mextesol.net/static/public/files/0eca85c6af6242c4f79e9417c9c680e4.pdf

Siti Farida Salleh, Yazid Yahya, Mary Fatimah Subet, & Muhammad Zaid Daud. (2020). Analisis semantik leksikal dalam novel *Sangkar* karya Samsiah Mohd. Nor. *Asian People Journal, 3*(1), 45-63. https://doi.org/10.37231/apj.2020.3.1.144

Stratton, S. J. (2024). Purposeful sampling: Advantages and pitfalls. *Prehospital and Disaster Medicine, 39*(2), 121-122. https://doi.org/10.1017/S1049023X24000281

Ulrikayanti, G. F. (2022). Pragmatics analysis on anger expression in #IndonesiaTerserah on Twitter. *Indonesian Journal of English Language Studies, 8*(1), 38-44. https://doi.org/10.24071/ijels.v8i1.3886

Umaimah Kamarulzaman, Rozaimah Rashidin, Afnieza Nurul, & Zuraidah Jantan. (2023). Pola bahasa kemurungan di media sosial: Analisis korpus linguistik. *Jurnal Melayu, 22*(2), 84-97.

van Kleef, G. A., & Lange, J. (2020). How hierarchy shapes our emotional lives: Effects of power and status on emotional experience, expression, and responsiveness. *Current Opinion in Psychology, 33*, 148-153. https://doi.org/10.1016/j.copsyc.2019.07.009

Vishnubhotla, K., Hammond, A., Hirst, G., & Mohammad, S. M. (2024). The emotion dynamics of literary novels. *Findings of the Association for Computational Linguistics: ACL 2024*, 2557-2574. https://doi.org/10.18653/v1/2024.findings-acl.150

Zhang, J., Xiong, Z., Zheng, H., & Ma, X. (2025). The moral psychological justification of anger: An exploration of self-respect and recognition. *Behavioral Sciences, 15*(1), Article 3. https://doi.org/10.3390/bs15010003

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Content Validity and Internal Consistency of a Moon Phases Achievement Test and a Science Self-Efficacy Questionnaire for Year 5 Primary Science

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ABSTRACT

This research examined the content validity as well as internal consistency of two instruments prepared for use in Year 5 primary science, the Moon Phases Achievement Test and the Science Self-Efficacy Questionnaire (SSEQ). The achievement assessment was designed by the researcher and contained 20 items covering the identification, sequence, and spatial and temporal relationships of Moon Phases. The 22-item self-efficacy questionnaire was adapted to measure vicarious experience, mastery experience, emotional state, as well as verbal persuasion. Each instrument underwent evaluation by an independent panel consisting of three experts. The relevance of each item was assessed using a four-point rating scale, while content validity was established through the calculation of the Item-Level Content Validity Index (I-CVI) and the Scale-Level Content Validity Index utilising the average approach (S-CVI/Ave). Every item demonstrated an I-CVI value of 1.00, and both instruments recorded an S-CVI/Ave value of 1.00. Expert comments nevertheless resulted in revisions to wording, visual presentation, item clarity, and construct representation before pilot testing. The revised instruments were administered to 60 Year 5 pupils from two schools. The achievement test recorded a KR-20 coefficient of 0.783 while the self-efficacy questionnaire demonstrated a Cronbach's alpha coefficient of 0.800. These results suggest that both instruments possess acceptable levels of content validity as well as internal consistency for the intended Year 5 primary science research context. Further psychometric evaluation is recommended before the instruments are applied more broadly.

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INTRODUCTION

Achievement and science self-efficacy are important outcomes in science education.

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Achievement reflects pupils' knowledge and understanding of scientific content, whereas science self-efficacy concerns their confidence in their capability to successfully undertake science-related activities. Prior research has indicated that self-efficacy is related to academic performance and science achievement (Bal-Taştan et al., 2018; Doménech-Betoret et al., 2017; Hasanah et al., 2021; Kirbulut & Uzuntiryaki-Kondakci, 2019). Therefore, accurate measurement of these outcomes requires instruments that are appropriate for the intended content, construct, and educational context.

This study focuses on two instruments for Year 5 primary science: a researcher-developed Moon Phases Achievement Test and an adapted Science Self-Efficacy Questionnaire (SSEQ). The Moon Phases topic is abstract and challenging for pupils (Chia et al., 2023; Hartanto et al., 2025; İnaltekin & Akbaba, 2024; Sağdıç, 2024), while science self-efficacy is relevant to how pupils' approach and perform science-related tasks (Bakar & Halim, 2022; Kirbulut & Uzuntiryaki-Kondakci, 2019; Ting et al., 2023). Since the two instruments have different purposes, structures and scoring systems, each instrument must be properly validated and tested for reliability prior to use in the larger study.

Achievement in the Moon Phases Topic

The Moon Phases topic is widely recognised as difficult for pupils to understand, given that it involves abstract astronomical concepts. Misconceptions include the belief that Moon Phases are caused by the Earth's shadow or clouds, and that the Moon produces its own light (LoPresto & Murrell, 2011; Türkmen, 2015). Difficulties in understanding the topic have also been reported in studies of astronomy learning and conceptual understanding (Chia et al., 2023; Syuhendri et al., 2022).

In the present study, a needs analysis drew on the 2023/2024 reports of *Pentaksiran Bilik Darjah* (PBD; classroom assessment) and *Ujian Akhir Sesi Akademik* (UASA; end-of-academic-session test). The reports indicated that Year 5 pupils attending *Sekolah Jenis Kebangsaan Tamil* (SJKT; Tamil national-type primary schools) in the Jempol district experienced difficulties answering questions on Moon Phases. Interviews with two science teachers also indicated difficulties in teaching the topic because of its abstract nature and limited support from concrete materials.

Previous research has developed instruments specifically for assessing understanding of lunar phases. Chastenay and Riopel (2020) developed the Moon Phases Concept Inventory for Middle School for pupils aged 10-14 and evaluated it with a sample that included Grade 5 pupils. Their study provides an established example of assessing lunar concepts among learners of a similar age to those in the present study. The measurement requirement in the present research concerns achievement in the Malaysian Year 5 Moon Phases curriculum, assessed through the particular content coverage, item formats and Tamil wording of the researcher-developed test.

The *Dokumen Standard Kurikulum dan Pentaksiran* (DSKP; Curriculum and Assessment Standard Document) for Year 5 Science provided the content basis for the achievement test, while the revised Bloom's taxonomy provided a framework for organising its cognitive demands (Anderson et al., 2001). The test addresses recognition of Moon Phases representations, names and sequence, and spatial and temporal relationships within a lunar cycle. These frameworks guided item development, but evidence was still needed concerning how well the resulting items represented the intended content. Sireci and Faulkner-Bond (2014) identify the definition, relevance and representation of the assessed domain as central considerations in evaluating test content. Accordingly, an expert review examined the suitability of the developed items, while pilot testing provided an initial estimate of the internal consistency of pupils' scores.

Science Self-Efficacy in Primary Science

Bandura's (1977) self-efficacy theory provides a conceptual basis for examining pupils' beliefs about their capability to undertake learning tasks. The theory identifies experiences of successful performance, observation of others, verbal persuasion and physiological states as sources of information from which individuals develop efficacy beliefs. In educational measurement, these sources are commonly represented as mastery experience, vicarious experience, social persuasion, and physiological and emotional states (Usher & Pajares, 2009). These sources concern the experiences and interpretations that inform capability beliefs; they should therefore be distinguished from direct judgements of capability.

Previous instrument-development studies illustrate how this distinction can guide measurement. Usher and Pajares (2009) developed a questionnaire assessing the four sources in middle-school mathematics and obtained evidence supporting a four-factor structure through successive stages of item development and evaluation. In primary science, Carroll et al. (2020) developed the Irish Science Self-Efficacy Children's Questionnaire (IS-SEC-Q) for investigating scientist-facilitated outreach among children aged 11-12. These studies provide a theoretical and empirical basis for examining sources of self-efficacy, while their findings relate to the instruments and populations they investigated.

The present 22-item SSEQ was adapted from the IS-SEC-Q and organised around mastery experience, vicarious experience, verbal persuasion and emotional state. Translation into Malay, contextual changes to the wording and modification from seven to five response categories produced a version requiring further evaluation. The International Test Commission (2017) recommends obtaining evidence for the intended use of adapted tests in the target population. The present study therefore examined the relevance and suitability of the adapted items through expert review and estimated internal consistency through pilot testing. The four proposed groups provided a

conceptual basis for this review; their factor structure was not tested in the present study.

The Need for Valid and Reliable Instruments

The purpose of instrument evaluation is to gather evidence supporting the interpretation of scores for an intended use. Sireci and Faulkner-Bond (2014) explain that evidence based on test content concerns the relationship between the assessment content and its stated purposes. For the Moon Phases Achievement Test, this required examination of the items against the specified curriculum content and cognitive demands. For the adapted SSEQ, it required examination of whether the wording remained relevant to the proposed sources of self-efficacy and appropriate for the intended pupils. Expert ratings and written comments provided complementary information about item relevance and areas requiring revision.

Internal consistency addresses a further measurement question: the extent to which item responses contribute consistently to the reported scores within the participating sample. However, an acceptable coefficient does not establish the dimensionality of a questionnaire (Taber, 2018). The present study therefore had two specific objectives for each instrument: to obtain content validity evidence through expert evaluation and to estimate internal consistency in a Year 5 pilot sample. KR-20 was used for the dichotomously scored achievement test, and Cronbach's alpha was used for the SSEQ. Together with the documented item revisions, these analyses provide preliminary evidence for the instrument versions prepared for the intended research context.

Research Gap and Rationale for the Study

The study arose from a need to prepare assessment instruments for a larger investigation of Year 5 primary science learning. The needs analysis, based on the 2023/2024 PBD and UASA reports and interviews with two science teachers, identified difficulties with the Moon Phases topic among the intended SJKT pupils. The achievement test was developed to assess identification of phase representations, knowledge of phase names and sequence, and understanding of spatial and temporal relationships within a lunar cycle. Its development therefore required decisions about curriculum coverage, cognitive demands, diagrams and wording in the Tamil translation. Examining these decisions was necessary to provide evidence that the test content corresponded to its intended assessment purpose (Sireci & Faulkner-Bond, 2014).

A related measurement requirement concerned the adapted SSEQ, which covered the four proposed sources of science self-efficacy. The questionnaire drew on the IS-SEC-Q developed by Carroll et al. (2020), but its use in the present context involved translation into Malay, changes to contextual wording and a reduction from seven to five response categories. Evidence concerning the original questionnaire could not, by itself, establish the suitability of this

modified version. The International Test Commission (2017) recommends obtaining reliability and validity evidence for adapted instruments in their intended populations. The present study addressed an initial part of this requirement through expert content review and pilot assessment of internal consistency.

The two instruments were intended to provide separate information about Moon Phases achievement and pupils' reported experiences relating to the sources of science self-efficacy within the same larger study. The present paper contributes preliminary measurement evidence for these instrument versions and documents the reasoning behind specific revisions. These include changes to astronomical diagrams and instructions in the achievement test, and more specific references to teachers, classmates and family members in the questionnaire. Reporting these decisions alongside item-level expert ratings allows readers to examine how the instruments were prepared and what was revised before pilot testing. The findings provide a basis for further evaluation of these versions within the intended Year 5 research context.

Research Objectives

This study aims to explore the validity and reliability of two instruments developed or adapted to be used in Year 5 primary science. In particular, the following goals were pursued:

1. To determine the content validity and internal consistency of the Year 5 Moon Phases Achievement Test.
2. To determine the content validity and internal consistency of the Science Self-Efficacy Questionnaire.

METHODOLOGY

Instrument Development, Adaptation and Preliminary Evaluation

This study examined the development of the Moon Phases Achievement Test and the adaptation of the Science Self-Efficacy Questionnaire (SSEQ), followed by content validation and pilot assessment of internal consistency. Both instruments were prepared for the same larger Year 5 science study, which required measures of achievement and pupils' experiences relating to sources of science self-efficacy. Their preparation is reported together to explain how these different measurement requirements were addressed. Each instrument had a separate evaluation objective, expert panel and internal consistency analysis.

The rationale for developing the achievement test was informed by a needs analysis involving the 2023/2024 Classroom Assessment (PBD) and Final Academic Session Test (UASA) reports for Year 5 SJKT pupils in the Jempol district, together with interviews with two science teachers. The reported difficulties provided a local basis for focusing on Moon Phases learning. The test was developed with reference to the Year 5 Science Curriculum and Assessment Standard Document (DSKP). Its intended abilities were identifying representations of Moon Phases, identifying and sequencing phase names, and interpreting spatial and temporal relationships within a lunar cycle.

A table of test specifications organised the content and cognitive demands using the revised Bloom's taxonomy (Anderson et al., 2001).

The SSEQ was adapted from the IS-SEC-Q developed by Carroll et al. (2020). Its preparation involved translation, contextual modification and a change from seven to five response categories. These changes required evaluation of the adapted version for its intended use, consistent with the International Test Commission (2017). Following development or adaptation and translation, both instruments underwent expert content review, revision based on written feedback and pilot administration to 60 Year 5 pupils. The evaluation reported here concerns content validity and internal consistency.

Year 5 Moon Phases Achievement Test

The Year 5 Moon Phases Achievement Test was developed with reference to the Year 5 Science DSKP (Ministry of Education, 2017). The test was designed to assess three main areas: i) identifying representations of Moon Phases, ii) mastering the names and sequence of the phases, and iii) understanding the spatial and temporal relationships involved in a complete lunar cycle.

The test contained 20 items: 16 multiple choices, 2 drawings, 1 matching, and 1 marking. The items were developed according to Bloom's updated taxonomy (Anderson et al., 2001). The difficulty distribution followed a ratio of 3:5:2, consisting of six low-difficulty items, ten moderate-difficulty items, and four high-difficulty items. Pupils were given one hour to complete the test. Correspondingly, a table of test specifications was prepared to ensure appropriate coverage of the intended content and cognitive levels. Table 1 presents the specification of the Year 5 Moon Phases Achievement Test.

The instrument assesses pupils' ability to i) identify drawings of the new and old crescent Moon, ii) identify and arrange the names and sequence of Moon phases, and iii) understand spatial and temporal relationships across one complete lunar cycle. Note that the achievement test was initially developed in Malay and subsequently translated into Tamil by an Excellent Science Teacher from SJKT. To ensure semantic equivalence, the Tamil version was then translated back into Malay by a Malay Language teacher from an SJKT following a back-translation procedure (Brislin, 1970; Creswell & Creswell, 2018; Gay et al., 2012). Subsequently, the back-translated Malay version was compared with the original Malay version to analyse discrepancies and ensure the intended meaning of each item was retained.

Science Self-Efficacy Questionnaire

Permission to use and adapt the IS-SEC-Q was obtained from the instrument developers prior to the adaptation. The questionnaire consisted of 22 items representing four dimensions of science self-efficacy: vicarious experience, mastery experience, emotional state, as well as verbal persuasion. Table 2 presents the constructs along with

Table 1
Specification of the Year 5 moon phases achievement test

Content Area	Remember	Understand	Apply	Analyse	Evaluate	Create	Total Items
Identifying representations of Moon Phases	1, 2, 3	4, 19, 20	–	–	–	–	6
Mastering the sequence and names of Moon Phases	–	–	7, 8, 9, 10, 11	5, 12, 14, 15, 16	–	–	10
Understanding spatial and temporal relationships in a complete lunar cycle	–	–	–	–	6, 13, 17	18	4
Total items	3	3	5	5	3	1	20
Difficulty level	Low	Low	Moderate	Moderate	High	High	
Difficulty distribution		6 low-difficulty items		10 moderate-difficulty items		4 high-difficulty items	3:5:2

Source: Authors' own work

Table 2
Constructs and number of items in the science self-efficacy questionnaire

Construct	Number of items
Mastery experience	6
Vicarious experience	4
Verbal persuasion	6
Emotional state	6
Total	22

Source: Authors' own work

the corresponding number of items included in the SSEQ.

The initial questionnaire employed a seven-point Likert scale. However, for the current study, the response format was adapted to a five-point Likert scale, with responses ranging from 1 (strongly disagree) to 5 (strongly agree). A five-point scale was selected as it provides a simpler response format for primary school pupils and reduces possible confusion in interpreting response options (Dawes, 2008; Revilla et al., 2014). The questionnaire contains five sections, namely i) Section A: demographic information, ii) Section B: mastery experience, iii) Section C: vicarious experience, iv) Section D: verbal persuasion, as well as v) Section E: emotional state.

Consequently, the questionnaire was translated into Malay and subjected to a back-to-back translation procedure. Two School Improvement Specialist Coaches Plus (SISC+) language officers with expertise in English language and Malay

language were involved in the translation process. The back-translated as well as translated versions were subsequently examined against the initial instrument to ensure consistency of meaning.

Content Validation

Separate panels of three experts evaluated the two instruments. The Moon Phases Achievement Test was reviewed by one university academic specialising in Science Education and two experienced science teachers. On the other hand, the SSEQ was reviewed by two university academics in education-related fields and one officer from the Science and Mathematics Unit of the Negeri Sembilan State Education Department. The experts were purposely selected based on their relevant academic qualifications, professional roles and expertise in Science Education, primary science teaching, STEM education, or science curriculum. The two school-based experts who evaluated the achievement test had over a decade of experience in the field of science education. Table 3 presents the profiles of the expert panels.

Both expert evaluation forms were reviewed by the research supervisor before they were distributed to the respective expert panels. Separate expert evaluation forms were used for the Moon Phases Achievement Test and the SSEQ. The achievement test evaluation form presented the study background, research objectives,

Table 3
Profiles of the expert panels

Instrument	Expert	Position	Institution	Field of Expertise/ Qualification
Year 5 Moon Phases Achievement Test	Expert 1	Professor	Universiti Putra Malaysia	PhD in Science Education
	Expert 2	Excellent Science Teacher, DG12	Sekolah Kebangsaan Nuri, Johol, Negeri Sembilan	B.Ed. in Primary Science Education
	Expert 3	Head of Science Panel, DG12	Sekolah Kebangsaan Tunku Kurshiah, Kuala Pilah, Negeri Sembilan	M.Ed. in Primary Science Education
Science Self-Efficacy Questionnaire	Expert 1	Senior Lecturer	Universiti Sains Malaysia	PhD in Biology Education and Educational Technology
	Expert 2	Senior Lecturer	Universiti Putra Malaysia	PhD in Science and STEM Education
	Expert 3	Assistant Director, Science and Mathematics Unit	Negeri Sembilan State Education Department	PhD in Primary Science Education

Source: Authors' own work

item formats, and table of test specifications. It identified the Year 5 Science Curriculum and Assessment Standard Document (DSKP) as the reference for curriculum coverage and the revised Bloom's taxonomy as the framework for classifying cognitive demands (Anderson et al., 2001). Experts were asked to consider the appropriateness of the format, language and terminology, curriculum coverage, item variety and intended difficulty levels. These materials provided a reference for examining the items against the stated assessment requirements.

The SSEQ evaluation form identified Carroll et al. (2020) as the source of the adapted questionnaire and presented definitions of mastery experience, vicarious experience, verbal persuasion and emotional state before their respective item groups. Experts were asked to consider item relevance, clarity, appropriateness of terminology and accuracy of meaning. The definitions and grouping of items provided a conceptual reference for examining whether the wording corresponded to the proposed sources of self-efficacy.

Both forms included instructions for assigning one relevance rating to each item using a four-point scale: 1 = not relevant, 2 = somewhat relevant, 3 = relevant and 4 = highly relevant. Space was provided for comments and suggested revisions. Providing explicit instructions, domain information and rating guidance is consistent with the preparation of content validation forms described by Yusoff (2019). Ratings of 3 or 4 were classified as indicating relevance when calculating the I-CVI, and the S-CVI/Ave was obtained by averaging the item-level indices (Polit & Beck, 2006). These indices concerned the items in the achievement test and SSEQ; they did not constitute a separate validation of the expert evaluation forms.

The I-CVI was determined as:

$$\text{I-CVI} = \frac{\text{Number of experts rating item as 3 or 4}}{\text{Total number of experts}}$$

The S-CVI/Ave was calculated as:

$$\text{S-CVI/Ave} = \frac{\text{Sum of all I-CVI values}}{\text{Total number of items}}$$

For panels consisting of three to five experts, an I-CVI of 1.00 was established as the required threshold for item acceptance, whereas an S-CVI/Ave of at least 0.80 was considered acceptable (Davis, 1992; Grant & Davis, 1997; Polit & Beck, 2006; Polit et al., 2007). Beyond the quantitative evaluations, the experts' written feedback, observations, and suggestions were reviewed and used to revise both instruments before pilot testing. Correspondingly, revised instruments were used in the pilot study.

Pilot Study

A pilot study was performed with 60 Year 5 pupils from two schools in Port Dickson. The schools were selected given that their pupils had age and background characteristics similar to those of the intended study population. Intact-group sampling was employed, whereby existing Year 5 classes were retained, and all pupils in the selected classes participated in the pilot study. No treatment or control groups

were formed, as the primary objective of the pilot study was to administer the same two instruments to all participants and to examine their reliability before use in the larger study.

The pupils were given one hour to complete the Moon Phases Achievement Test and 15 minutes to complete the SSEQ. The pilot study was implemented to assess the internal consistency of both research instruments as well as to determine whether further revisions were required before their use in the larger study.

Reliability Analysis

The Moon Phases Achievement Test used dichotomous scoring, with each response scored as correct (1) or incorrect (0). Although the test included multiple-choice, drawing, matching, and marking items, all responses were converted into dichotomous scores. Therefore, the KR-20 coefficient was applied to evaluate the instrument's internal consistency.

The SSEQ utilised a five-point Likert scale and was assessed through Cronbach's alpha. A coefficient of 0.70 or higher was regarded as an acceptable level of internal consistency, while values of 0.80 or above were interpreted as good (George & Mallery, 2003).

Ethical Considerations

Approval to conduct the pilot study and administer the research instruments was obtained from the Educational Planning and Policy Research Division, Ministry of Education (MoE) Malaysia [Approval No: KPM.600-3/2/3-eras (25668)]. The validation and pilot-testing procedures formed part of the larger research study and were conducted in accordance with the approved research procedures. Note that permission was obtained from the relevant authorities and participating schools before data collection.

Written informed consent was secured from the parents or legal guardians, while assent was obtained from the participating pupils prior to the commencement of data collection. Participation in the study was entirely voluntary, and all information gathered was utilised exclusively for research purposes. The identities of the participating pupils and schools were kept confidential in the reporting of the findings.

RESULTS

Content Validity of the Year 5 Moon Phases Achievement Test

Item-Level and Scale-Level Content Validity

Three experts evaluated the Year 5 Moon Phases Achievement Test, with all 20 items receiving ratings of 3 (relevant) or 4 (highly relevant) from each expert. Consequently, every item obtained an I-CVI of 1.00. The overall S-CVI/Ave was also 1.00, exceeding the minimum acceptable value of 0.80. Table 4 presents the item-level expert ratings as well as content validity indices.

Although all items met with the I-CVI criterion, the experts recommended several revisions to improve item presentation, wording, visual clarity and cognitive demand. Therefore, the quantitative CVI findings were considered together with the experts' written comments.

Table 4
Expert ratings and content validity indices for the Year 5 moon phases achievement test

Item	Expert 1	Expert 2	Expert 3	Agreement	I-CVI	Decision
1	4	4	4	3	1.00	Retained
2	4	4	4	3	1.00	Retained
3	3	4	4	3	1.00	Retained
4	3	4	4	3	1.00	Retained
5	4	4	4	3	1.00	Retained
6	3	3	4	3	1.00	Retained
7	4	4	4	3	1.00	Retained
8	4	4	4	3	1.00	Retained
9	4	4	4	3	1.00	Retained
10	4	4	4	3	1.00	Retained
11	4	4	4	3	1.00	Retained
12	4	3	3	3	1.00	Retained
13	4	3	4	3	1.00	Retained
14	4	4	4	3	1.00	Retained
15	4	4	4	3	1.00	Retained
16	4	4	4	3	1.00	Retained
17	3	4	4	3	1.00	Retained
18	4	4	4	3	1.00	Retained
19	4	4	4	3	1.00	Retained
20	4	4	4	3	1.00	Retained
S-CVI/Ave					1.00	Accepted

Source: Authors' own work

Expert Feedback and Revisions to the Achievement Test

The experts discovered the test's overall content was relevant to the Moon Phases topic but proposed several improvements. Consequently, these recommendations were incorporated before the instrument was used in the pilot study. Table 5 summarises the main feedback and revision actions.

The revisions mainly improved the clarity, visual representation, organisation and cognitive coverage of the test. No items were omitted as all 20 items met with the required I-CVI.

Content Validity of the Science Self-Efficacy Questionnaire

Item-Level and Scale-Level Content Validity

The 22-item SSEQ was evaluated by three experts according to its four constructs: vicarious experience, mastery experience, emotional state, as well as verbal persuasion. All items received ratings of 3 or 4 from all three experts and obtained an I-CVI of 1.00. The overall S-CVI/Ave was also 1.00. Table 6 presents the expert ratings according to the four constructs.

Table 5
Expert feedback and revisions to the Year 5 moon phases achievement test

Item	Expert Feedback	Revision Action
1, 2, 3, 4, 6, 7, 8, 10, and 11	Arrange answer options consistently from shorter to longer responses.	The answer options were rearranged from shorter to longer responses.
6	Revise the instructions to improve clarity.	The instruction was revised, and the answer options were adjusted accordingly.
12	Add the Sun to strengthen the representation of the Moon Phases concept.	A Sun diagram was added to the right side of the figure.
12	Add an orbital line to clarify the sequence of the Moon Phases.	A counterclockwise orbital line was added to the figure.
13	Improve the contrast between the illuminated and dark portions of the Moon.	The Moon diagram was revised using a darker colour setting.
13	Replace Roman numerals with alternative alphabetical labels.	Roman numerals were replaced with the letters K, L, M, and N.
18 and 20	Include items that require pupils to create or draw representations of the Moon Phases.	The items were revised as drawing tasks requiring pupils to produce Moon Phase representations.

Source: Authors' own work

Table 6
Expert ratings and content validity indices for the science self-efficacy questionnaire

Construct	Item	Expert 1	Expert 2	Expert 3	Agreement	I-CVI	Decision
Mastery experience	1	4	4	4	3	1.00	Retained
	2	4	4	4	3	1.00	Retained
	3	3	4	3	3	1.00	Retained
	4	4	4	4	3	1.00	Retained
	5	4	4	4	3	1.00	Retained
	6	3	4	4	3	1.00	Retained
Vicarious experience	7	3	4	4	3	1.00	Retained
	8	4	4	3	3	1.00	Retained
	9	3	4	4	3	1.00	Retained
	10	4	4	3	3	1.00	Retained
Verbal persuasion	11	4	4	4	3	1.00	Retained
	12	3	4	3	3	1.00	Retained
	13	4	4	4	3	1.00	Retained
	14	4	4	4	3	1.00	Retained
	15	4	3	4	3	1.00	Retained
	16	3	4	3	3	1.00	Retained
Emotional state	17	4	4	4	3	1.00	Retained
	18	4	4	4	3	1.00	Retained
	19	3	4	4	3	1.00	Retained
	20	4	3	3	3	1.00	Retained
	21	4	4	4	3	1.00	Retained
	22	3	4	4	3	1.00	Retained
S-CVI/Ave						1.00	Accepted

Source: Authors' own work

Although all items met with the required I-CVI value, several received ratings of 3, along with recommendations for wording, specificity, and construct representation. These comments were used to revise the questionnaire before pilot testing.

Expert Feedback and Revisions to the Science Self-Efficacy Questionnaire

The expert feedback mainly concerned the clarity and contextual appropriateness of the wording used for Year 5 pupils. Several general terms were replaced with more specific references, while selected items were rewarded to represent their respective self-efficacy constructs. Table 7 presents the main revision of actions.

The revisions included all 22 items, but increased linguistic clarity, specificity, age appropriateness, and consistency with the four intended sources of science self-efficacy.

Table 7
Expert feedback and revisions to the science self-efficacy questionnaire

Item	Expert Feedback	Revision Action
3	The original negatively worded item required recording and clearer wording.	Revised to: "I successfully complete difficult science tasks after working hard."
6	The term "most" was unnecessary.	The term was removed.
7	The term "adults" was too general.	"Adults" was replaced with "teacher."
8 and 10	The sentence structure was lengthy.	The wording was shortened by removing unnecessary phrasing.
9	The term "children" was too general.	"Children" was replaced with "classmates."
11, 12, 14, and 16	The phrase indicating that someone "told" the pupil did not clearly represent praise or encouragement.	The wording was revised to reflect praise more directly.
12	The term "people" was too general.	"People" was replaced with "teachers."
14	The term "good" required more appropriate wording.	The wording was revised using a more suitable expression of positive ability.
15	The original item reflected classmates' preference for collaboration rather than direct verbal persuasion.	Revised to reflect praise from classmates for the pupil's contribution to science tasks.
16	The term "adults" was too general.	"Adults" was replaced with "family members."
17	The original wording required a clearer expression of emotional tension.	Revised to: "I feel tense when doing science tasks."
18	The original wording required a clearer expression of fatigue.	Revised to: "Doing science tasks makes me feel tired."
19	The expression referring to feeling "stressed and nervous" was simplified.	The wording was revised to express the feeling "anxious."
20	The original item was considered more cognitive than emotional.	The item was revised to better reflect the emotional-state construct.
21	The sentence structure was revised for clarity.	Revised to: "I feel stressed when starting a science task."
22	The term referring to feeling "depressed" was considered unsuitable for the intended context.	Revised to reflect reduced interest when thinking about learning science.

Source: Authors' own work

Reliability of the Year 5 Moon Phases Achievement Test

The reliability of the Year 5 Moon Phases Achievement Test was analysed based on the pilot study of 60 Year 5 pupils. Each of the 20 items was rated dichotomously with 1 = correct and 0 = incorrect. The test obtained a KR-20 coefficient of 0.783, which is acceptable with regard to internal consistency.

Reliability of the Science Self-Efficacy Questionnaire

Cronbach's alpha was used to measure the internal consistency of the 22-item SSEQ. The Cronbach's alpha coefficient for the questionnaire was 0.800, which is considered to have good internal consistency. The results of reliability for both instruments are summarised in Table 8.

Overall, the results indicated that all items in both instruments had an I-CVI of 1.00, and the S-CVI/Ave of each instrument was 1.00, indicating that all items in both instruments met the specified content validity criterion. The expert feedback led to revisions in wording, visual presentation, item structure, and construct alignment, without removing any items. The subsequent pilot study produced a KR-20 coefficient of 0.783 for the achievement test and a Cronbach's alpha coefficient of 0.800 for the self-efficacy questionnaire.

DISCUSSION

This research investigated the content validity and internal consistency of two instruments intended for Year 5 primary science: the researcher-developed Moon Phases Achievement Test and the adapted SSEQ. The findings provide strong evidence of content validity for both instruments, while the pilot study showed acceptable to good internal consistency. The results are discussed in terms of the different purposes and characteristics of the two instruments.

Validity of the Year 5 Moon Phases Achievement Test

The Year 5 Moon Phases Achievement Test achieved an I-CVI of 1.00 for all 20 items and an S-CVI/Ave of 1.00. With three experts, an I-CVI of 1.00 indicates unanimous agreement regarding the relevance of every item, while the overall S-CVI/Ave exceeded the recommended minimum criterion (Davis, 1992; Polit & Beck, 2006; Polit et al., 2007). These findings provide evidence that the test content was considered appropriate for its intended purpose.

Table 8
Reliability results for the two instruments

Instrument	Number of Items	Reliability Analysis	Coefficient	Interpretation
Year 5 Moon Phases Achievement Test	20	KR-20	0.783	Acceptable
Science Self-Efficacy Questionnaire	22	Cronbach's alpha	0.800	Good

Source: Authors' own work

Other than that, the test's content validity was supported by its systematic construction. The items were aligned with the Year 5 Science curriculum and distributed across varying cognitive domains according to the updated Bloom's taxonomy framework (Anderson et al., 2001). This was important as the Moon Phases topic requires pupils to perform more than simple recall. Pupils must i) identify representations of the phases, ii) arrange them in sequence, and iii) understand spatial and temporal relationships across a complete lunar cycle. Previous studies have demonstrated that Moon Phases remain difficult for pupils and are associated with persistent misconceptions (Chia et al., 2023; Hartanto et al., 2025; İnaltekin & Akbaba, 2024; Syuhendri et al., 2022). Therefore, adequate coverage of the intended content and cognitive demands was necessary when constructing the achievement test.

Importantly, the perfect CVI values did not mean that no revisions were required. The experts recommended improvements to the organisation of answer options, item wording, diagram clarity, orbital representation, and the cognitive demand of selected items. These revisions demonstrate the value of considering both qualitative expert feedback and numerical CVI values. Expert judgement in instrument development should not be limited to determining whether an item is retained or rejected. However, it should also be used to improve content representation and item quality (Grant & Davis, 1997). Thus, the content-validation process strengthened the achievement test even though all items had already met the quantitative acceptance criterion.

Validity of the Science Self-Efficacy Questionnaire

The SSEQ likewise obtained an I-CVI of 1.00 for all 22 items and an S-CVI/Ave of 1.00. These results indicate complete agreement among the three experts on the relevance of each item to the intended questionnaire content (Polit & Beck, 2006; Polit et al., 2007).

In contrast to the achievement test, the questionnaire was modified based on the IS-SEC-Q introduced by Carroll et al. (2020). The original instrument provided the conceptual structure for measuring four dimensions of science self-efficacy, namely i) mastery experience, ii) vicarious experience, iii) verbal persuasion, as well as iv) emotional state. Nonetheless, adaptation involved translation, contextual modification, and a change from a seven-point to a five-point response scale. Hence, it was necessary to validate the adapted version.

Several items needed to be modified as indicated by the expert feedback, although they have been rated as acceptable. General terms like "adults", "children," and "people" were changed to more specific terms like "teacher", "classmates", "teachers," and "family members". Other items were amended for a more accurate reflection of verbal persuasion or emotional condition. These changes improved the clarity and context of the questionnaire for the target Year 5 primary school pupils.

Equivalence between the original and adapted versions was also achieved through the translation process. Back-translation is widely used to determine if the meaning of the translations is consistent with the meaning of the source instrument (Brislin, 1970). In this study, the translation and expert-review processes complemented one another by examining both linguistic equivalence and contextual suitability. The use concerning a five-point response scale was also considered more manageable for younger respondents, consistent with previous discussions concerning the number of response categories used in rating scales (Dawes, 2008; Revilla et al., 2014).

Nevertheless, the present findings should be clarified as evidence of content validity for the adapted questionnaire rather than comprehensive evidence of construct validity. Although the items were considered appropriate representations of the four proposed sources of science's self-efficacy, additional psychometric evaluation would still be necessary to investigate the latent factor structure of the adapted version.

Reliability of the Year 5 Moon Phases Achievement Test and Science Self-Efficacy Questionnaire

The Year 5 Moon Phases Achievement Test obtained a KR-20 coefficient of 0.783. This indicates acceptable internal consistency for the 20 dichotomously scored items (George & Mallery, 2003). The use of KR-20 was appropriate as all responses, including drawing, matching, and marking items, were ultimately scored as correct or incorrect.

The SSEQ obtained a Cronbach's alpha coefficient of 0.800, reflecting good internal consistency based on the interpretation adopted in this study (George & Mallery, 2003). This result suggests that the 22 items demonstrated satisfactory consistency in the pilot sample.

The use of different reliability coefficients reflected the different scoring characteristics of the two instruments. The achievement test assessed correct or incorrect performance, whereas the self-efficacy questionnaire measured responses on a Likert scale. Therefore, reliability coefficients should be interpreted according to the instrument's nature and intended use rather than treated as a single universal indicator of instrument quality (Taber, 2018).

The reliability findings support the use of both instruments in this intended study context. Nonetheless, internal consistency represents only one aspect of reliability. Hence, the coefficients reported in this study should be interpreted as evidence obtained from the pilot sample rather than as proof that the instruments will produce identical reliability estimates across all populations and settings.

CONCLUSION

This research investigated the reliability as well as validity of a researcher-developed Year 5 Moon Phases Achievement Test and an adapted SSEQ. Both instruments underwent systematic preparation, expert content validation, revision based on expert feedback, pilot testing, and reliability analysis.

All 20 items in the achievement test and all 22 items in the self-efficacy questionnaire achieved an I-CVI of 1.00, while both instruments obtained an S-CVI/Ave of 1.00. Note that the achievement test produced a KR-20 coefficient of 0.783, demonstrating an acceptable level of internal consistency. Meanwhile, the SSEQ recorded a Cronbach's alpha coefficient of 0.800, reflecting good internal consistency.

This study provides preliminary content validity and internal consistency evidence for two instruments prepared for a larger Year 5 science study. Its contribution lies in the evaluation of the developed and adapted versions and the documentation of item revisions arising from expert feedback. Further evaluation should examine achievement test item performance, the factor structure of the adapted SSEQ, and the interpretation of scores when the instruments are used to assess change following instruction.

IMPLICATION OF THE STUDY

Expert review was followed by revisions to both instruments and administration of the revised versions to 60 Year 5 pupils. Although all items met the specified relevance criterion, the written feedback identified changes needed in instructions, diagrams and questionnaire wording. All 20 achievement test items and 22 SSEQ items were retained. The subsequent pilot provided estimates of internal consistency for the revised versions, with KR-20 of 0.783 for the achievement test and Cronbach's alpha of 0.800 for the SSEQ. These stages documented the preparation and initial evaluation of the instruments for the larger study.

The intended next application was assessment before and after science instruction in the larger Year 5 study. The achievement test was prepared to assess performance on the specified Moon Phases content, while the SSEQ was prepared to collect pupils' reports concerning mastery experience, vicarious experience, verbal persuasion and emotional state in science learning. Their different purposes allowed the larger study to examine achievement and experiences associated with the proposed sources of self-efficacy. The present article reports the evidence obtained during instrument preparation; their subsequent application and any instructional outcomes are outside its scope.

The study's contribution includes the record of how expert feedback informed the preparation of these instrument versions. Tables 5 and 7 connect specific concerns to corresponding revisions, including changes to astronomical diagrams, instructions, social referents and expressions of encouragement. This record illustrates why unanimous relevance ratings can still be accompanied by recommendations for revision. It also allows readers to examine the reasoning behind the changes when considering the instruments for related research. Further use requires attention to the intended interpretation of scores and the evidence available for that purpose, consistent with Sireci and Faulkner-Bond (2014).

LIMITATIONS OF THE STUDY

This study possesses several limitations. Each instrument was evaluated by a separate panel of three experts, consistent with the minimum panel size discussed by Polit and Beck (2006). With three experts, an I-CVI of 1.00 requires all three to judge an item relevant by assigning a rating of 3 or 4. All items in the present study met this criterion. Consequently, the S-CVI/Ave was also 1.00 for each instrument because it was calculated by averaging the item-level indices. These findings document agreement within the participating panels. Nevertheless, the small number of experts limited the range of perspectives represented, and further review by a larger panel with varied expertise could provide additional insights into content coverage and item suitability.

The factor structure of the adapted SSEQ was not examined. Although expert review addressed item relevance and Cronbach's alpha provided an estimate of internal consistency, these findings do not establish whether the items form the four proposed groups. As Taber (2018) explains, an acceptable alpha coefficient does not demonstrate the dimensionality of a scale. This remains a limitation following the questionnaire's translation, contextual adaptation, and change in response format. Further research should examine the proposed structure through factor analysis. Sample planning for this work should consider the communalities of the items and the number of indicators representing each factor, as these influence sample-size requirements (MacCallum et al., 1999).

The pilot study involved 60 Year 5 pupils from two schools in Port Dickson. Bujang et al. (2024) propose a minimum of 30 respondents for preliminary questionnaire reliability assessment under the statistical assumptions considered in their review. The present sample exceeded this suggested minimum, providing support for its use at the pilot stage. However, meeting a general recommendation does not establish the precision of a particular reliability estimate; sample requirements also depend on the intended statistical power or precision (Bonett, 2002). Recruitment from intact classes in only two schools' further limits wider generalisation. The reported coefficients should therefore be interpreted as estimates obtained from this pilot sample.

Finally, the Moon Phases Achievement Test was developed specifically for the Year 5 Moon Phases topic and should not be interpreted as a general measure of primary science achievement. Similarly, the SSEQ was adapted for the intended study context, and further validation may be required before its use with different populations or settings.

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REFERENCES

Anderson, L. W., Krathwohl, D. R., Airasian, P. W., Cruikshank, K. A., Mayer, R. E., Pintrich, P. R., Raths, J., & Wittrock, M. C. (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives* (Complete ed.). Longman.

Bakar, M. R. A., & Halim, L. (2022). Pembinaan model literasi saintifik pelajar berdasarkan faktor persekitaran pembelajaran konstruktivisme, pengetahuan sains, sikap terhadap sains, efikasi kendiri dan motivasi. *Jurnal Pendidikan Malaysia, 47*(1), 1-18. https://doi.org/10.17576/JPEN-2022-47.01SI-01

Bal-Taştan, S., Davoudi, S. M. M., Masalimova, A. R., Bersanov, A. S., Kurbanov, R. A., Boiarchuk, A. V., & Pavlushin, A. A. (2018). The impacts of teacher's efficacy and motivation on student's academic achievement in science education among secondary and high school students. *EURASIA Journal of Mathematics, Science and Technology Education, 14*(6), 2353-2366. https://doi.org/10.29333/ejmste/89579

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*(2), 191-215. https://doi.org/10.1037/0033-295X.84.2.191

Bonett, D. G. (2002). Sample size requirements for testing and estimating coefficient alpha. *Journal of Educational and Behavioral Statistics, 27*(4), 335-340. https://doi.org/10.3102/10769986027004335

Brislin, R. W. (1970). Back-translation for cross-cultural research. *Journal of Cross-Cultural Psychology, 1*(3), 185-216. https://doi.org/10.1177/135910457000100301

Bujang, M. A., Omar, E. D., Foo, D. H. P., & Hon, Y. K. (2024). Sample size determination for conducting a pilot study to assess reliability of a questionnaire. *Restorative Dentistry & Endodontics, 49*(1), Article e3. https://doi.org/10.5395/rde.2024.49.e3

Carroll, S., Sheahan, J., McCauley, V., & Grenon, M. (2020). *Development and validation of the Irish science self-efficacy children's questionnaire to assess the short-term influence of scientists facilitating outreach* [Preprint]. bioRxiv. https://doi.org/10.1101/2020.01.25.919357

Chastenay, P., & Riopel, M. (2020). Development and validation of the moon phases concept inventory for middle school. *Physical Review Physics Education Research, 16*(2), Article 020107. https://doi.org/10.1103/PhysRevPhysEducRes.16.020107

Chia, Y. K., Lim, S. H., Kiew, S. P., Koo, R. R. J., Lau, I. Z. W., Ling, Y. R., Chongo, S., & Lapawi, N. (2023). Overcoming students' misconception on moon phases: A classroom action research. *International Journal of Advanced Multidisciplinary Research and Studies, 3*(6), 375-379. https://www.multiresearchjournal.com/arclist/list-2023.3.6/id-1934

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE.

Davis, L. L. (1992). Instrument review: Getting the most from a panel of experts. *Applied Nursing Research, 5*(4), 194-197. https://doi.org/10.1016/S0897-1897(05)80008-4

Dawes, J. (2008). Do data characteristics change according to the number of scale points used? An experiment using 5-point, 7-point and 10-point scales. *International Journal of Market Research, 50*(1), 61-77. https://doi.org/10.1177/147078530805000106

Doménech-Betoret, F., Abellán-Roselló, L., & Gómez-Artiga, A. (2017). Self-efficacy, satisfaction, and academic achievement: The mediator role of students' expectancy-value beliefs. *Frontiers*

in Psychology, 8, Article 1193. https://doi.org/10.3389/fpsyg.2017.01193

Gay, L. R., Mills, G. E., & Airasian, P. W. (2012). *Educational research: Competencies for analysis and applications* (10th ed.). Pearson.

George, D., & Mallery, P. (2003). *SPSS for Windows step by step: A simple guide and reference* (4th ed.). Allyn & Bacon.

Grant, J. S., & Davis, L. L. (1997). Selection and use of content experts in instrument development. *Research in Nursing & Health, 20*(3), 269-274. https://doi.org/10.1002/(SICI)1098-240X(199706)20:3%3C269::AID-NUR9%3E3.0.CO;2-G

Hartanto, T. J., Mustika, M., & Budi, G. S. (2025). Improving prospective physics teachers' conceptual understanding of moon phases through an integrated observational and virtual simulation learning. *Prisma Sains: Jurnal Pengkajian Ilmu dan Pembelajaran Matematika dan IPA IKIP Mataram, 13*(4), 933-948. https://doi.org/10.33394/j-ps.v13i4.16338

Hasanah, R. S., Sholihin, H., & Nugraha, I. (2021). An investigation of junior high school students' science self-efficacy and its correlation with their science achievement in different school systems. *Journal of Science Learning, 4*(2), 192-202. https://doi.org/10.17509/jsl.v4i2.27275

İnaltekin, T., & Akbaba, B. (2024). Investigation of middle school students' model of astronomy events and information sources of incorrect model. *International Journal of Contemporary Educational Research, 11*(4), 508-524. https://doi.org/10.52380/ijcer.2024.11.4.680

International Test Commission. (2017). *The ITC guidelines for translating and adapting tests* (2nd ed.). https://www.intestcom.org/files/guideline_test_adaptation_2ed.pdf

Kirbulut, Z. D., & Uzuntiryaki-Kondakci, E. (2019). Examining the mediating effect of science self-efficacy on the relationship between metavariables and science achievement. *International Journal of Science Education, 41*(8), 995-1014. https://doi.org/10.1080/09500693.2019.1585594

LoPresto, M. C., & Murrell, S. R. (2011). An astronomical misconceptions survey. *Journal of College Science Teaching, 40*(5), 14. https://www.nsta.org/journal-college-science-teaching/journal-college-science-teaching-mayjune-2011/astronomical

MacCallum, R. C., Widaman, K. F., Zhang, S., & Hong, S. (1999). Sample size in factor analysis. *Psychological Methods, 4*(1), 84-99. https://doi.org/10.1037/1082-989X.4.1.84

Ministry of Education. (2017). *Pelan pembangunan pendidikan Malaysia 2013-2025*. https://www.moe.gov.my/menumedia/media-cetak/penerbitan/dasar/1207-malaysia-education-blueprint-2013-2025/file

Polit, D. F., & Beck, C. T. (2006). The content validity index: Are you sure you know what's being reported? Critique and recommendations. *Research in Nursing & Health, 29*(5), 489-497. https://doi.org/10.1002/nur.20147

Polit, D. F., Beck, C. T., & Owen, S. V. (2007). Is the CVI an acceptable indicator of content validity? Appraisal and recommendations. *Research in Nursing & Health, 30*(4), 459-467. https://doi.org/10.1002/nur.20199

Revilla, M. A., Saris, W. E., & Krosnick, J. A. (2014). Choosing the number of categories in agree–disagree scales. *Sociological Methods & Research, 43*(1), 73-97. https://doi.org/10.1177/0049124113509605

Sağdıç, A. (2024). Shedding light on pre-service science teachers' instructional preferences and hurdles in teaching phases of the moon. *Kastamonu Education Journal, 32*(2), 201-214. https://doi.org/10.24106/kefdergi.1473470

Sireci, S., & Faulkner-Bond, M. (2014). Validity evidence based on test content. *Psicothema, 26*(1), 100-107. https://doi.org/10.7334/psicothema2013.256

Syuhendri, S., Siahaan, S. M., & Pasaribu, A. (2022). Lunar phases refutation texts: Supplement texts to overcome students' misconceptions. *European Journal of Education and Pedagogy, 3*(6), 157-160. https://doi.org/10.24018/ejedu.2022.3.6.504

Taber, K. S. (2018). The use of Cronbach's alpha when developing and reporting research instruments in science education. *Research in Science Education, 48*(6), 1273-1296. https://doi.org/10.1007/s11165-016-9602-2

Ting, C. W., Surat, S., & Rahman, S. (2023). Tahap efikasi kendiri dan penguasaan kemahiran berfikir aras tinggi (KBAT) dalam kalangan murid. *Jurnal Dunia Pendidikan, 4*(4), 318-333. https://doi.org/10.55057/jdpd.2022.4.4.27

Türkmen, H. (2015). After almost half-century landing on the moon and still countering basic astronomy conceptions. *European Journal of Physics Education, 6*(2), 1-17. https://doi.org/10.20308/ejpe.70434

Usher, E. L., & Pajares, F. (2009). Sources of self-efficacy in mathematics: A validation study. *Contemporary Educational Psychology, 34*(1), 89-101. https://doi.org/10.1016/j.cedpsych.2008.09.002

Yusoff, M. S. B. (2019). ABC of content validation and content validity index calculation. *Education in Medicine Journal, 11*(2), 49-54. https://doi.org/10.21315/eimj2019.11.2.6

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Case Study

Influence of L1 Interference (Tamil) on SJKT Students' Use of English Grammar in Writing: A Case Study

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ABSTRACT

Tamil medium (SJKT) pupils often experience difficulties in English writing due to structural differences between Tamil and English in multilingual Malaysia. This study examines the impact of L1 interference (Tamil) on students' understanding and usage of English grammar in writing. This study adopts mixed methods case study design. The data were collected from narrative writing samples and semi-structured interviews which were produced by 15 Year 6 SJKT students and from semi-structured interviews. Error analysis is used to analyse the written text to identify and sort out grammatical errors. Interview data were thematically analysed in order to explore learners' perceptions. The findings show recurrent 178 grammatical errors with most common ones involving subject verb agreement, tense usage, articles, word order, and prepositions. Many of these errors were caused by Tamil to English direct transfer. The interview results show that students often think in Tamil before writing in English, depend heavily on translation and possess limited awareness about English morphosyntax. The study concludes that L1 interference (Tamil) is a significant factor affecting English writing accuracy among SJKT pupils. Such an insight is useful to understand that they need more English input and writing practices that help think directly in English.

Keywords: English writing, error analysis,multi lingual, L1 interference, Tamil medium learners, error analysis,multi lingual

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INTRODUCTION

Writing in a second language remains one of the hardest literacy skills for bilingual learners as they must grasp grammar and be able to interpret meaning in two different languages. In Malaysia, where

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many languages are spoken, Tamil medium (SJKT) students often acquire English as a second language in environments in which Tamil is the main language at home and in the community. When students write in English in this sociolinguistics environment, they typically use Tamil grammatical patterns, which leads to mistakes in tense, articles, subject-verb agreement, prepositions, and word order (Krishnasamy et al., 2024; Maniam, 2021). This type of language interference is especially strong when children are under a lot of pressure to learn several different languages simultaneously. This makes it hard for them to use grammar, syntax, and vocabulary correctly in their writing (Mehat et al., 2024). Recent study on error analysis has shown that mother tongue influence is a major cause of ongoing grammatical problems for Tamil background speaking students and show that the differences in structure between Tamil and English, especially in syntax and morphology, lead to consistent errors like misplaced verbs, missing articles and wrong inflections (Maniam, 2021; Sheroon et al., 2025). These findings indicate that L1 interference arises not only from direct translation but also from profound grammatical transfer, which impacts students' ability to use English conventions in connected writing (Maniam, 2021; Sheroon et al., 2025). Many Malaysian academics also point to contextual and teaching factors that make grammatical problems worse, in addition to L1 effect((Abdul Ghani & Shing, 2019; Mehat & Ismail, 2021; Shamimah Mohideen, 2022).

Furthermore, studies on Malaysian ESL learners show that limited exposure to English outside the classroom, along with difficulties in applying grammatical rules in writing tasks contribute to recurring grammatical errors (Ali et al., 2023). Moreover, research on SJKT learners shows that although students may understand certain grammatical rules, they often struggle to apply them accurately in extended writing tasks. This is largely attributed to L1 interference, where mother tongue influence affects grammatical production in the target language (Krishnasamy et al., 2024).

Given this context, a focused case study evaluating how Tamil L1 interference impacts SJKT students' knowledge and use of English grammar in writing solves an important gap. Although the current research outlines common error types, there are a small number of studies that integrate learner perspectives, systematic error coding, and classroom realities to clarify the persistence of interference and its interaction with teaching approaches. Therefore, this study utilises an error analysis methodology, triangulated with student interviews and writing samples, to figure out the most persistent Tamil influenced grammatical patterns and provide classroom-oriented suggestions for improvement.

LITERATURE REVIEW

Educational and Linguistic Background of Tamil-Medium Learners in Malaysia

The Department of Statistics Malaysia reports that Indians constitute approximately 6.5%

of Malaysia's total population (Department of Statistics Malaysia, 2024).Over 80% of this group are ethnic Tamils, which means that Tamil is the most common language used by Indian Malaysians (Mahalingam, 2023). Tamil medium National type primary communication across domains such school Sekolah Jenis Kebangsaan Tamil business, science, diplomacy and also (SJKT), are a big help in keeping the Tamil language and culture alive. In addition, there are about 523 SJKT schools in Malaysia right now. These schools serve about 60% of Indian Malaysian students, many of whom originate from families with low to moderate incomes (Nagappan et al., 2023). Despite their cultural importance, Tamil schools continue to face persistent challenges such as inadequate infrastructure, limited financial resources, and constrained access to educational support (Nagappan, 2023). Although government agencies and community organisations have made ongoing efforts to improve facilities and educational quality, these limitations continue to affect teaching and learning outcomes. In SJKT, Tamil serves as the primary medium of instruction for most of the subjects, which provides students with an extensive exposure to Tamil during their schooling years (Government of Malaysia, 2026). Due to this, students usually experience trouble learning English, especially when it comes to writing, where grammar and sentence structure are quite important.

Role of English in the Malaysian Education System

In Malaysia, English is an important second language and an important means for people all over the world to communicate to each other. English language is also widely recognised as a global lingua franca and is extensively used in international communication across domains such as business, science, diplomacy and also education (Abdullo qizi, 2026; Zeng & Yang, 2024). English is a compulsary subject in primary as well as secondary schools in Malaysian education system. It is also the main language of teaching at most university. Additionally, English language is widely used in Malaysia for official documentation, particularly in legal texts, financial transactions, contracts and international communication (Department of Information Malaysia, 2025). The Ministry of Education (MoE) has implemented several policy reforms to strengthen English language teaching upon recognising the importance of English for national development and global competitiveness. Moreover, major reforms include the introduction of the Kurikulum Bersepadu Sekolah Rendah (KBSR) and Kurikulum Bersepadu Sekolah Menengah (KBSM) under the Integrated Secondary School Curriculum in 1989, which emphasised communicative competence and speaking skills. Later, these initiatives were extended through the implementation of the Kurikulum Standard Sekolah Rendah (KSSR) and the English Language Education Roadmap 2015-2025, which aligned English language instruction

with the Common European Framework of Reference for Languages (CEFR) (Yahaya & Wong, 2022).Studies show that many Malaysian students continue to face difficulties in achieving adequate English language proficiency despite years of formal instruction in schools especially in developing communicative competence when entering higher education (Nadesan & Shah, 2020).

English Language Learning in Tamil Vernacular

Learning English as a third language in vernacular schools may contribute to lower English proficiency among students as learners often face mother tongue interference and perceive English as a challenging subject (Kumaran & Krish, 2021). Studies also indicate that time allocation for English language lessons is 5 hours per week in the national schools, but only 2.5 hours per week in Tamil vernacular schools (Kumaran & Krish, 2021). Thus, students from Tamil vernacular schools have less exposure to the English language which may hinder their acquisition of the English language. Ironically, vernacular education in Malaysia allows minority communities to receive primary education in their respective mother tongues.On top of that, in SJKT, Tamil functions as the main medium of instruction while Bahasa Melayu is taught as a second language and English is offered as a third language in accordance with the national curriculum structure (Ministry of Education Malaysia, 2026). In national schools, English is the second language and given greater emphasis in lessons. This is different from how it is established here. Research shows that students in Tamil medium schools receive considerably less exposure to English compared to their counterparts in national schools, where English is allocated approximately 300 minutes per week under the KSSR framework (Kumaran & Krish, 2021). SJKT schools have less chances to give students meaningful English practice since their curriculum is rigid and they don't have enough time to teach. As a result, interference from the first language (Tamil) becomes more noticeable especially in writing where students tend to transfer grammatical structures from their L1 into English (Al-Saggaf et al., 2022; Kumaran & Krish, 2021).

Writing needs the active production and organisation. Hence these learners frequently transfer Tamil sentence patterns into English, leading to chronic grammatical problems.

Grammar and Writing in Second Language Learning

Writing is a complicated skill that needs students to make writings that are grammatically correct, make sense, and well organised (Bulqiyah et al., 2021). In the second language (L2) acquisition, grammar is essential for facilitating learners in expressing meaning with clarity and precision. Grammatical knowledge includes syntax, morphology, and word classes, all of which are important for constructing meaningful sentences (Akbaş & Ölçü-

Dinçer, 2021). Tamil speaking students have a hard time learning English grammar since the two languages are very different in terms of their structure. Tamil is an agglutinative language with a subject-object-verb (SOV) word order and no article system.Whereas English follows a subject-verb-object (SVO) structure and relies on articles a well as tense marking. These structural differences between the two languages often lead to grammatical errors in English writing including incorrect tense usage, omission of articles, subject–verb agreement errors and non-standard sentence structures (Kumaran & Krish, 2021; Sinnappan & Abdul Samat, 2024; Sarveswaran, 2024).

Moreover, empirical study on ESL learners indicates that a concerning proportion of Tamil primary school students consistently exhibit grammatical errors in their written English.The grammatical errors remain frequent in writing, particularly in areas such as subject-verb agreement, verb tense, plural forms and word choice (Alyas, 2019; Permatasari et al., 2019). Such errors make writing less clear, structured, and better overall, which often leads to bad ratings.

Pedagogical Approaches to Grammar Instruction

In there is an ongoing discussion about the effective methods to teach grammar. Meaning focused training stresses using language in the context to communicate while form focused instruction stresses teaching grammatical rules directly. Moreover, research indicates that less proficient learners often benefit from explicit, form focused instruction while more advanced learners tend to respond more positively to implicit, meaningfulness approaches, depending on learner proficiency and grammatical complexity (van Rijt et al., 2019).

Nevertheless, questions persist regarding the effectiveness of specific grammar instruction in fostering effortless and intuitive language utilisation. On the other hand, some scholars argue that grammar knowledge developed through isolated rule based instruction may not always transfer effectively to communicative use unless it is reinforced through contextualised practice and meaningful language use (Nassaji, 2017). These findings reveal that grammar instruction must be tailored to the learners' skill levels and language backgrounds, especially in multilingual and vernacular educational settings like SJKT schools.

L1 Interference and Grammatical Errors in SJKT Learners' Writing

A growing body of research identifies L1 interference as a crucial factor contributing to grammatical errors in English writing among Tamil medium learners (Kumaran & Krish, 2021; Raman et al., 2022). Additionally, learners often import Tamil grammatical patterns into English since they don't hear or read English very often and rely a lot on Tamil grammar. Consequently, this leads to a pattern of repeated errors. Despite considerable evidence of grammatical challenges in informal education, there's a lack of focused research on how Tamil

as a first language affects the grammatical choices of SJKT students when they write extended essays.

While recent studies have examined the broad challenges faced by students in vernacular schools, they have not offered thorough assessments of how Tamil grammar is applied in their writing. This gap highlights the need for a detailed, context-specific investigation. Such an investigation is crucial for a better understanding of grammatical errors and for creating effective teaching strategies.

Theoretical Framework: Error Analysis and L1 Transfer Theory

This study is grounded in Error Analysis (EA) Theory (Corder, 1967; 1974) and L1 Transfer/Interference Theory (Selinker, 1972; Odlin, 1989), which together provide a comprehensive structure for investigating grammatical errors in second language writing. EA views learner errors as systematic and meaningful indicators of interlanguage development, as opposed to arbitrary errors. Consequently, it allows researchers to identify, classify, and measure errors, distinguishing between interlingual errors stemming from L1 influence and intralingual errors resulting from overgeneralisation or inadequate L2 proficiency. L1 Transfer Theory elucidates the impact of a learner's first language on the acquisition and utilisation of a second language. For Tamil speaking learners, features such as the absence of articles and the SOV word order in Tamil often result in article omission, verb placement errors, and non standard sentence structures in English writing (Kumaran & Krish, 2021; Raman et al., 2022). This study combines EA and L1 Transfer Theory to not only record the various types and frequency of grammatical errors in SJKT students' writing, but also to explain the linguistic reasons behind these errors. These theoretical approaches together enhance the understanding of Tamil L1 interference's impact on English grammatical precision and establish a foundation for establishing targeted pedagogical techniques to elevate English writing instruction in Tamil vernacular schools.

METHODOLOGY

Research Design

In order to investigate the impact of first language (L1) interference from Tamil on the English grammar usage of SJKT students in writing, this study utilised mixed methods research design. A mixed methods approach is suitable as it integrates both quantitative and qualitative data, allowing for a more comprehensive understanding of language learning phenomena by combining statistical patterns with contextual interpretation (Creswell & Creswell, 2023).

The case study design allows a comprehensive analysis of students' genuine written work in a natural classroom environment, enabling the researcher to discern systemic grammatical mistake patterns and deduce their root causes (Yin, 2018). In the field of second language acquisition, case studies are extensively

employed to examine L1 transfer effects. This is because they reflect learners' authentic language usage rather than mere test performance (Duff, 2022).

Research Setting and Participants

The study was carried out in a Tamil medium vernacular primary school which is Sekolah Jenis Kebangsaan Tamil in Malaysia. Moreover, the participants for this study comprised of 15 Year 6 students and purposive sampling was used to select these students based on their consistent difficulties in English writing as identified by their English language teacher. These learners represented a typical linguistic profile of Tamil speaking students in vernacular schools, where Tamil is the primary language of instruction in daily communication. Here English is learned as a second or third language. Besides that, all participants used Tamil as their dominant language at home and in school which makes them appropriate subjects for examining Tamil L1 interference in English grammatical production.

Sampling Procedure

Purposive sampling was employed to select participants who met specific criteria that aligned with the research objectives (Campbell et al., 2020). The selection process involved consultation with the English teacher, examination of recent writing tasks and also confirmation that participants met the following inclusion criteria: (a) Tamil as their first language, (b) enrolment in Year 6, and (c) recurring grammatical errors in English for data collection, ethical approval was obtained from the school administration and written parental consent was secured for all participants who met the criteria.

Data Collection Instruments

Two tools have been utilised for gathering data: 1. Writing samples from students and 2. Semi-structured nterviews that are only partly structured. Each participant engaged in a narrative writing activity derived from a standardised prompt according to the Year 6 English curriculum. Narrative writing activities are effective in encouraging extended learner output which allows grammatical structures and error patterns to emerge during language production (Hyland, 2019). After the writing assignment, individual semi structured interviews were carried out to investigate students' impressions of their writing challenges, language usage habits and understanding of Tamil to English transfer. These semi structured interviews offer adaptability while ensuring uniformity across participants and are extensively utilised in qualitative language research (Cohen et al., 2022). Moreover, all interviews were audio recorded and transcribed verbatim.

Data Analysis

Students' written texts were analysed using EA procedures which involves error identification, classification and explanation as specified by Corder 1974. Then, these errors were categorised into grammatical areas such as subject verb agreement, tense

usage, articles, prepositions and sentence structure with particular emphasis on errors reflecting Tamil language transfer. It is evident that recent studies continue to support EA as a method for identifying interlanguage patterns in second language writing (Ferris, 2023).

Consequently, the interview transcripts were analysed using thematic analysis following the phases outlined by Braun and Clarke (2022) which includes familiarisation, coding, theme development and interpretation. For thematic analysis, the themes related to L1 influence, limited English exposure and also challenges in understanding English grammar were identified. Finally, data from both sources were triangulated to enhance the credibility of the findings.

Validity and Reliability

Validity and reliability of this study were assessed using approaches that enhance the overall credibility of the research process. Whereas Methodological triangulation, which collected data from students' written texts and semi structured interviews, enhanced validity, particularly for reliability. The utilisation of various data sources allowed the researcher to validate findings and confirm that interpretations of grammatical errors. This was based on both tangible linguistic evidence and students' reflections on their language usage. This triangulated technique reduced the likelihood of single source bias and improved the overall understanding of Tamil L1 interference in English grammatical formation (Creswell & Poth, 2023).

The systematic use of EA processes enhanced analytical validity by ensuring that grammatical errors were consistently identified, categorised and comprehended in accordance with recognised linguistic frameworks. Moreover, the categorisation of errors into specific grammatical classifications has guaranteed analytical accuracy and enabled meaningful comparisons across participants. The thematic analysis of interview data followed clear and systematic coding rules which made the results more reliable (Braun & Clarke, 2022). In addition, reliability was ensured by maintaining a clear and complete audit record of the study methods that included how data was collected, how it was transcribed, how it was coded and how it was analysed. This comprehensive recording makes it easier to look back at the research process. If necessary, the process will be repeated in a similar situation. Additionally, using a standardised writing prompt and the same interview questions for all participants has increased procedural dependability by making sure that data collection was consistent (Cohen et al., 2018). Finally, confirmability was attained by making all interpretations on empirical data derived directly from students' written samples and interview portion, to minimise researcher bias. During the analysis, reflexive awareness was maintained to ensure that conclusions were derived from the facts rather than prior assumptions. In mixed methods second language writing research these processes ensured that the study's findings are trustworthy, reliable and robust.

RESULTS

The findings from the analysis of students' written essays, the categorisation of grammatical errors and the semi structured interview data are presented in this section. Here the quantitative analysis reports the frequency and distribution of grammatical error types, while the qualitative analysis provides an in depth understanding of the influence of Tamil (L1) on students' English grammar usage. Moreover,the comprehensive and profound analysis revealed 178 grammatical errors in 15 student essays. Furthermore, the errors were organised into six distinct categories which are subject-verb agreement, tense errors, articles and determiners, prepositions, word order and plural/singular forms respectively. Table 1 presents the distribution, percentage, and mean for each category

The most common faults were subject-verb agreement and tense problems. This shows that Tamil had a big effect on morphology and syntax. Errors involving articles, prepositions and word order shown substantial evidence of L1 effect. Errors

Table 1
Types of recurrent English grammar errors among SJKT Tamil-medium learners

No.	Error Category	Description	Frequency (n)	Percentage (%)	Mean
1	Subject-Verb Agreement	Incorrect matching of verb to subject number/person	42	24%	0.24
2	Tense Errors	Incorrect use of past, present, or continuous tenses	35	20%	0.20
3	Preposition Errors	Substitution/omission of prepositions due to L1 transfer	31	17%	0.17
4	Articles & Determiners	Misuse or omission of a, an, or the	28	16%	0.16
5	Word Order Errors	Tamil syntactic structure applied to English	24	13%	0.13
6	Plural/Singular Forms	Incorrect pluralisation influenced by Tamil morphology	18	10%	0.10
Total	—	—	178	100%	1.00

Table 2
Categories of Tamil (L1) interference in students' English grammar

No.	Type of L1 Interference	Description	Frequency (n)	Percentage (%)
1	Direct Translation	Literal Tamil-to-English transfer	29	33%
2	Morphological Transfer	Tamil tense/plural markers mapped incorrectly to English	24	28%
3	Syntactic Reordering	Use of SOV Tamil order instead of English SVO	22	25%
4	Omission Influence	Articles/prepositions omitted due to Tamil's grammatical structure	14	14%
Total	—	—	89	100%

pertaining to plural and singular forms were few, however noted among the majority of the students.

L1 (Tamil) Interference Categories

Besides identifying error frequencies, the analysis examined the specific types of Tamil linguistic transfer influencing students' English writing. As a result, four major categories emerged, as shown in Table 2.

Examples of Common Errors Found in Students' Writing

Table 3 provides examples of incorrect student sentences, corrected versions, and the type of L1 influence involved. To illustrate the nature of the grammatical difficulties, these examples highlight how Tamil language structures influence students' English writing, resulting in recurring errors in tense, subject-verb agreement, articles, prepositions, word order, and plural forms.

Interview Findings and Thematic Analysis

In order to explore students' awareness of their errors, their writing processes and the impact of Tamil on their English grammar semi structured interviews were carried out. During the interview process, five questions were posed as shown in Table 4. The interview data offered valuable insights into the impact of Tamil (L1) on

Table 3
Representative grammar errors and corrected forms

Error Type	Student Sample (Incorrect)	Corrected Form	L1 Influence
Tense	"He go to school yesterday."	"He went to school yesterday."	Tamil: unchanged verb root
SVA	"My friends is playing."	"My friends are playing."	Tamil verbs do not inflect for number
Articles	"I bought pen from shop."	"I bought a pen from the shop."	Tamil lacks articles
Prepositions	"She sat in the car behind."	"She sat behind the car."	Different spatial markers in Tamil
Word Order	"I food eating now."	"I am eating food now."	Tamil SOV order
Plural	"Two boy came."	"Two boys came."	Tamil plural rules differ

Table 4
Interview Questions and Sample Student Responses

No.	Interview Question	Sample Student Response	Identified Theme
1	When you write in English, do you think in Tamil first or in English? Why?	"I think in Tamil first because it is easier."	Over-reliance on Tamil Structure
2	Which parts of English grammar do you find most difficult, and why?	"I get confused with is, are, was because Tamil doesn't change verbs."	Limited English Morphosyntax

Table 4 (*continued*)

No.	Interview Question	Sample Student Response	Identified Theme
3	Can you give an example of a sentence you find difficult to write in English?	"I write 'I food eating' because that is Tamil order."	Syntactic Transfer
4	Do you often translate Tamil sentences directly into English?	"I always translate straight from Tamil."	Direct Translation
5	What helps you learn English grammar better?	"I learn better with examples and reading."	Exposure to English Input

Table 5
Coded themes and supporting statement frequency

Theme No.	Theme	Frequency (n)	Percentage (%)
1	Overreliance on Tamil Structure	18	39%
2	Limited Awareness of English Morphosyntax	15	33%
3	Insufficient Exposure to English Input	13	28%
Total	—	46	100%

the students' use of English grammar. These five semi structured questions were posed to investigate students' cognitive processes during writing, their perceived challenges with grammar, their inclination to translate directly from Tamil and the educational environments that facilitate their English language development. As shown in Table 4 students frequently stated that they first thought in Tamil before writing in English, which led to direct translations and structural shifts. Many encountered difficulties with English grammar, particularly with subject-verb agreement, verb tenses, and the use of articles.

This is because these features lack direct counterparts in Tamil. Upon request for challenging sentence examples, numerous students generated constructions that mirrored the SOV pattern characteristic of Tamil. Students acknowledged that they frequently translate Tamil sentences directly into English even when they are uncertain about the accuracy. Ultimately, they conveyed that engagement with accurate English examples, instructional clarifications and organised practice significantly contributed to their advancement. The analysis of these responses revealed three main themes as shown in Table 5. Those are an over reliance on Tamil structure, a limited awareness of English morphosyntactic rules and insufficient exposure to English input respectively.

Narrative Integration of Interview Data

The responses from the interviews highlighted three prominent themes as shown in Table 5. At first, numerous students acknowledged that they formulate

sentences in Tamil mentally before attempting an English translation which led to direct syntactic transfer and structural inaccuracies. Secondly, students conveyed confusion about English grammatical rules, especially concerning tense usage, subject verb agreement, and articles, as there are no equivalent markers in Tamil. Third, students indicated that their exposure to English beyond the classroom was limited, which led to their dependence on Tamil structures in their writing.

Comprehensive Error Distribution by Student

Table 6 provides a detailed breakdown of the grammatical errors made by each of the 15 SJKT students included in the study. Moreover, the table shows how different learners make different kinds of errors by putting them into groups such as subject-verb agreements, tense errors, articles, and determiners, prepositions, word order, and plural/singular forms. Table 6 also provides a comprehensive overview of error patterns and illustrates the extent to which L1 (Tamil) interference impacts each student's writing. The data showed that students made mistakes in different areas and these errors varied in how often they happened and what they were. According to research, most of the errors were in subject-verb agreement (42 times) followed by tense mistakes (35 times). This observation supports the information presented in Table 1. Sometimes, students faced challenges with these categories because Tamil doesn't use verb inflections to show subject-verb agreement or tense, unlike English.

Table 6
Errors by student across all categories

No.	Student Code	SVA	Tense	Articles	Prepositions	Word Order	Plural	Total
1	S1	4	3	2	2	1	1	13
2	S2	3	2	1	3	2	1	12
3	S3	2	3	3	1	2	2	13
4	S4	3	2	2	3	1	1	12
5	S5	4	3	2	1	2	0	12
6	S6	3	2	1	2	3	1	12
7	S7	2	1	2	3	1	2	11
8	S8	3	3	2	2	1	1	12
9	S9	4	2	1	1	3	1	12
10	S10	3	3	2	2	1	1	12
11	S11	2	2	3	1	2	2	12
12	S12	3	2	2	3	1	1	12
13	S13	4	3	1	2	2	1	13
14	S14	2	2	2	1	2	1	10
15	S15	3	3	1	2	1	2	12
Total	—	42	35	28	31	24	18	178

This indicates a significant impact of Tamil on the morphological and syntactic aspects of English. The structural differences between Tamil and English are shown by the 28 errors related to articles and determiners, 31 errors involving prepositions and the 24 errors in word order. Similarly, the lack of articles in Tamil along with its more flexible spatial markers, might explain why students often omit or change words in their writing.

In addition, students sometimes made errors with word order because they used Tamil's subject-object-verb (SOV) structure instead of English's subject-verb-object (SVO) structure. Moreover, the plural/singular category had the fewest errors with only 18, yet most students still made them. This means that even when students know some of the criteria for making English plural, the morphological plural indicators from Tamil may still make them less consistent in how they use English. The majority of whereas the student with the fewest errors (S14) made 10 errors. This shows that L1 interference was a big problem in this group. shows that grammatical challenges are common and come in many forms and a lot of them happening in areas where Tamil and English have the most structural differences. These results validate the previously identified quantitative patterns and provide a comprehensive insight into the difficulties encountered by individual learners.

DISCUSSION

This study examined how Tamil, the students' first language, affected the grammatical accuracy of English writing among students at SJKT. The analysis used data from written essays, error analysis, and interviews. The results show that Tamil significantly influenced the students' grammatical choices especially in areas where the structural differences between the two languages are most obvious.

Quantitative data reveals consistent errors in subject-verb agreement, tense usage, article application, preposition selection, and word order, all of which are closely linked to structural differences between Tamil and English. The prevalence of subject-object-verb (SOV) word order, coupled with the omission of articles and auxiliary verbs, suggests a definitive pattern of first language (L1) transfer, rather than simple mistakes.

Qualitative data corroborate this finding by demonstrating that students frequently formulate their ideas in Tamil before translating them into English, thereby leading to syntactic interference and grammatical errors. Despite this, interviews revealed that students have a limited understanding of English morphosyntactic rules and don't use the language much outside of class. These factors together lead to consistent errors, rather than random ones. Studies show that Tamil speaking students' first language greatly affects their English writing skills. To help with this, it's important to use clear contrastive instruction, give students many examples of correct English and assign writing tasks that encourage thinking in English, rather than translating from Tamil.

By looking at how Tamil affects English grammar use, teachers may come up with

good ways to help students improve their writing and make fewer mistakes that keep happening.

CONCLUSION

In conclusion, the findings reveal that 15 SJKT students experienced grammatical difficulties in their English writing, with subject–verb agreement and tense errors occurring most frequently. Errors involving articles and determiners, prepositions, word order and plural/singular forms further highlight the challenges students face when applying English grammatical rules. These patterns suggest that structural differences between Tamil and English may contribute to learners' grammatical difficulties especially in areas involving verb morphology, article usage and sentence structure. However, L1 interference should be considered alongside other possible contributing factors, such as learners' proficiency levels and exposure to English. Overall, the findings demonstrate the importance of examining both the frequency and nature of grammatical errors to better understand students' writing difficulties and inform targeted English grammar instruction for Tamil speaking learners.

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REFERENCES

Abdullo qizi, S. A. (2026). The role of English as a global language in international communication. *Tadqiqotlar, 84*(1), 89-92. https://journalss.org/index.php/tad/article/view/24803

Akbaş, E., & Ölçü-Dinçer, Z. (2021). Accuracy order in L2 grammatical morphemes: Corpus evidence from different proficiency levels of Turkish learners of English. *Studies in Second Language Learning and Teaching, 11*(4), 607-627. https://doi.org/10.14746/ssllt.2021.11.4.6

Ali, Z., Shahid, S. H., Mohd Ali, A. Z., Bakri Ahmed, A. H., & Jayapalan, E. (2023). Error analysis: Investigating the paragraph writing of ESL Malaysian learners. *Issues in Language Studies, 12*(1), 1–-15. https://doi.org/10.33736/ils.5031.2023

Alyas, R. (2019). A quantitative approach analysis on subject-verb agreement problem among English as second language learners: A case study of Pakistani students. *Journal of Literature, Languages and Linguistics, 56*, 1-10. https://doi.org/10.7176/JLLL/56-01

Al-Saggaf, M. A., Asbollah, A. Z. B., & Abd Rahim, M. B. (2022). L1 interference in L2 writing: A

study on Year 3 BTESL students. *International Journal of Linguistics and Translation Studies, 3*(2), 20-32. https://doi.org/10.36892/ijlts.v3i2.226

Braun, V., & Clarke, V. (2022). *Thematic analysis: A practical guide*. SAGE Publications.

Bulqiyah, M. A., Mahbub, M. A., & Maimunah, M. (2021). Students' writing difficulties in English as a foreign language: A systematic review. *Lingua Cultura, 15*(1), 1-7. https://doi.org/10.21512/lc.v15i1.6882

Campbell, S., Greenwood, M., Prior, S., Shearer, T., Walkem, K., Young, S., Bywaters, D., & Walker, K. (2020). Purposive sampling: Complex or simple? Research case examples. Journal of Research in Nursing, 25(8), 652–661. https://doi.org/10.1177/1744987120927206

Corder, S. P. (1967). The significance of learners' errors. International Review of Applied Linguistics in Language Teaching, 5(1-4), 161-170. https://doi.org/10.1515/iral.1967.5.1-4.161

Corder, S. P. (1974). Error analysis. In J. P. B. Allen and S. P. Corder (Eds.), The Edinburgh course in applied linguistics: Vol. 3. Techniques in applied linguistics (pp. 122-154). Oxford University Press

Cohen, L., Manion, L., & Morrison, K. (2018). Research methods in education (8th ed.). Routledge. https://doi.org/10.4324/9781315456539

Creswell, J. W., & Creswell, J. D. (2023). *Research design: Qualitative, quantitative, and mixed methods approaches* (6th ed.). SAGE Publications.

Department of Information Malaysia. (2025). *Official language*. Malaysia Government Portal. https://www.malaysia.gov.my/en/government/kenali-malaysia/official-language

Department of Statistics Malaysia. (2024). *Current population estimates, Malaysia, 2024*. https://www.dosm.gov.my/portal-main/release-content/current-population-estimates-2024

Duff, P. A. (2022). Case study research in applied linguistics. *Annual Review of Applied Linguistics, 42*, 1-20.

Ferris, D. R. (2023). What error correction can(not) accomplish for second language writers: Dispelling myths, discussing options. University of Michigan Press. https://doi.org/10.3998/mpub.10006921

Government of Malaysia. (2026). *National school*. Malaysia Government Portal. https://www.malaysia.gov.my/en/topics/sekolah-kebangsaan

Hyland, K. (2019). *Second language writing*. Cambridge University Press.

Kumaran, P. N., & Krish, P. (2021). Mother tongue interference in English writing among Tamil school students. *GEMA Online Journal of Language Studies, 21*(1), 110-123. https://doi.org/10.17576/gema-2021-2101-07

Krishnasamy, I., Nachiappan, S., & Husin, M. R. (2024). Analysis of grammar errors in writing by SJKT students. *International Journal of Academic Research in Progressive Education and Development, 13*(3), 1771-1777. https://doi.org/10.6007/ijarped/v13-i3/22163

Mahalingam, M. (2023). Language, literature and cultural identity: A narrative from the Malaysian Tamil diaspora. In N. Singh & S. Chapparban (Eds.), *Literature of girmitiya: History, culture and identity* (pp. 23-41). Palgrave Macmillan. https://doi.org/10.1007/978-981-19-4621-9_2

Maniam, M., Samuel, S. J., Madya, S., & Assaiqeli, A. (2021). The influence of L1 (Tamil language) in the writing of L2 (English). *Psychology and Education Journal, 58*(2), 1875-1884. https://doi.org/10.17762/pae.v58i2.2344

Mehat, S. Z., Ismail, L., Noordin, N., & Ali, A. M. (2024). Error analysis of narrative writing among

secondary school students in Selangor, Malaysia. *International Journal of Academic Research in Progressive Education and Development, 13*(4), 2737-2751. https://doi.org/10.6007/ijarped/v13-i4/23652

Ministry of Education Malaysia. (2026). *Primary school education structure in Malaysia*. Malaysia Government Portal. https://www.malaysia.gov.my/en/categories/sekolah--pendidikan/sekolah-rendah

Nadesan, N. K., & Shah, P. M. (2020). Non-linguistic challenges faced by Malaysian students in enhancing speaking skills. *Creative Education, 11*, 1988-2001. https://doi.org/10.4236/ce.2020.1110145

Nassaji, H. (2017). Grammar acquisition and instruction in second language learning: A review. *Language Teaching Research, 21*(5), 567-595.

Nagappan, R., & Mukherjee, H. (Eds.). (2023). *Malaysian Indians and education: Reimagined development opportunities*. Routledge. https://doi.org/10.4324/9781003257394

Odlin, T. (1989). Language transfer: Cross-linguistic influence in language learning. Cambridge University Press.

Permatasari, L. A., Kalukar, V., & Wardani, I. (2019). An analysis of grammatical errors in writing thesis proposal of English department students in Mulawarman University in the academic year 2018/2019. *E3L: Journal of English Teaching, Linguistic, and Literature, 2*(2), 60-64. https://doi.org/10.30872/e3l.v2i2.1994

Gass, S. M., Behney, J., & Plonsky, L. (2020). *Second language acquisition: An introductory course* (5th ed.). Routledge.

Raman, K., Sandaran, S. C., & Gunasegaran, I. (2022). Perceptions of ESL teachers from Tamil vernacular type schools (SJKT) about online teaching and learning during Covid-19 pandemic. *LSP International Journal, 9*(2), 65-83. https://doi.org/10.11113/lspi.v9.19370

Sarveswaran, K. (2024). *Morphology and syntax of the Tamil language*. arXiv. https://arxiv.org/abs/2401.08367

Selinker, L. (1972). Interlanguage. International Review of Applied Linguistics in Language Teaching, 10(1–4), 209–232. https://doi.org/10.1515/iral.1972.10.1-4.209

Sheroon, M. I. R., Sujani, M., Nowzath, M., & Muhammed, M. R. R. (2025). The impact of the mother tongue on English language acquisition among ESL learners in the Sri Lankan context. *Competitive Journal of Education, 4*(2), 159-170. https://doi.org/10.58355/competitive.v4i2.163

Sinnappan, M., & Abdul Samat, N. (2024). Interlingual error analysis in the writing of Tamil-speaking college students. *Forum for Linguistic Studies, 6*(6), 965-977. https://doi.org/10.30564/fls.v6i6.6949

van Rijt, J. H. M., de Swart, P. J. F., & Coppen, P.-A. J. M. (2019). Linguistic concepts in L1 grammar education: A systematic literature review. *Research Papers in Education, 34*(5), 621-648. https://doi.org/10.1080/02671522.2018.1493742

Yahaya, M. F., & Wong, B. E. (2022). The use of CEFR in English language education reform: Foreign textbooks and cultural issues. *Quantum Journal of Social Sciences and Humanities, 3*(1), 1-15.

Yin, R. K. (2018). *Case study research and applications: Design and methods* (6th ed.). SAGE Publications.

Zeng, J., & Yang, J. (2024). English language hegemony: Retrospect and prospect. *Humanities and Social Sciences Communications, 11*, Article 317. https://doi.org/10.1057/s41599-024-02821-z

Abdul Ghani and Shing (2019): Investigated the relationship between teacher factors, teaching methodologies, and Malaysian undergraduates' grammatical errors

Mehat and Ismail (2021): Examined Malaysian tertiary ESL students' writing errors, including interlingual and intralingual errors, and discussed implications for English language teaching.

Shamimah Mohideen (2022): Discussed grammatical errors among Malaysian university students and identified limited familiarity with and exposure to English as possible contributing factors.

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Architectural Barriers and Accessibility in Public Buildings of Pakistan: A User Perspective

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ABSTRACT

Accessibility and environmental design are necessities that shape community participation possibilities for individuals. becoming the parameter that restricts individuals' mobility and activities. this study aims to propose strategies for improving building design and functionality and provide recommendations for creating environments accessible to all. Despite existing accessibility legislation, a significant research gap remains due to the lack of building-level accessibility assessments in major civic buildings of Karachi and Hyderabad, Pakistan. A cross-sectional study design was employed to assess 1000 people visiting Civic Centre Karachi, Hyderabad and Shahbaz Building Hyderabad, Pakistan, using non-probability convenience sampling. The questionnaire comprised a demographic sheet and 19 indicators of physical barriers on a 5-point Likert scale. Descriptive statistics and Chi-square tests in SPSS were used to analyse the responses. Most of the visitors of the public buildings disagreed with the easy accessibility of the entrance, appropriate ramp designs, clear signage, automatic doors, space for manoeuvring, seating area, handrails, etc. Nevertheless, over 50% visitors agreed that there were no steps or even, non-slip surfaces in the entrance area, and the lighting was adequate. There were significant associations between key accessibility features presence of ramps and wide entrance doors ($p < .001$), between automatic doors for entry and exit and visitors' satisfaction ($p < .001$), and appropriate ramps ,space for manoeuvring ($p < .001$). The findings support policymakers and design professionals in improving accessibility,

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enhancing compliance, and promoting inclusive public buildings. Legislated accessibility standards must be enforced to achieve universal, inclusive architectural design of public spaces.

Keywords: Architectural barriers, accessibility, disabled people, physical barriers, public buildings

INTRODUCTION

Accessibility is familiar as a basic necessity for any individual. It shapes social and community participation possibilities for individuals. Further, it encompasses around Environment design too. The Environmental design refers to the planning and design of the built environment in ways that promote accessibility, safety, usability, and inclusion for individuals of all ages and abilities. It involves architectural layouts, circulation systems, entrances, ramps, lighting and signage that influence how people interact with buildings. Well-designed environments support Universal Design principles by minimising physical barriers and maximising independent access for everyone. It becomes the parameter that promotes or restricts individuals' mobility and activities. The factors that become barriers can vary depending on the type of disability. For example, stairs can become a restriction for individuals using wheelchairs. Similarly, less visual information can be problematic for people with hearing impairments (Carlsson et al., 2022).

More than 15% of the urban population has a moderate or severe disability. The World Report on Disability highlights that 60% of disabled people face difficulties accessing buildings due to architectural barriers (Mirza et al., 2023). Each resident has equivalent freedoms and commitments to get a respectable living; however, handicaps have not yet felt the uniformity of privileges. Numerous public offices have not thought about the necessities and accommodations of people with disabilities, particularly wheelchair users. This issue makes it challenging for wheelchair clients to get to public offices, so they can't take an interest completely in public activity (Lianto et al., 2021).

Most of the public office buildings do not have inclines, balustrades, or any other support systems. Passageways, lavatories, and restrooms are often so narrow or insignificant that they are difficult to access. This makes the majority of public structures, the sick bay, and departments unapproachable. The implementation of universal design, or building for everyone, depends on various contextual factors, such as structure, functionality, environment, and socio-economic factors. The usability of public buildings can be enhanced if buildings are designed keeping in mind the factors of age, ability, or disability of individuals. This promotes convenience, accessibility, usability, pleasure, ease of use, and overall benefits all. Therefore, it is necessary to explore the impact of barriers in public buildings and to identify the challenges faced by users (David, 2008) and

later design public areas to meet the diverse needs of the public (National Disability Authority, 2026).

Civic Centre Karachi, Civic Centre Hyderabad, and Shahbaz Building Hyderabad were selected as representative case studies because they are major government public buildings with high public footfall, making them appropriate settings for evaluating accessibility barriers experienced by diverse users. Such barriers might limit the mobility of persons with different needs of mobility, such as wheelchair users, people with strollers, pregnant women, and others with temporary or permanent disabilities. Circulation problems, inadequately designed ramps, curbs, parking facilities, and lack of orientation systems usually hinder access, which means that the effectiveness of the public spaces is compromised. Solving the problem of accessibility is vital for ensuring that everyone uses the building effectively and independently. Universal Design provides a framework for overcoming such obstacles by promoting the usability of environments and products for the widest range of individuals, regardless of age, size, ability, or other differences. As Story et al. (1998) emphasised, Universal Design focuses on the creation of spaces that accommodate diverse abilities and needs. Practical applications of these principles include ramps and elevators to facilitate vertical circulation, lighting that accounts for sensory differences, and clear signage or wayfinding systems that enhance navigation. Integrating such principles into building design promotes inclusivity, enhances usability, and supports sustainable environments for all users.

The research intends to offer recommendations for creating environments that will enable equal access for everyone. However, despite already existing legislation on accessibility, such as Pakistan Engineering Council (2021)and Pakistan Engineering Council (2006), a noticeable gap in research persists due to the absence of an assessment of accessibility on a building level in large civic buildings in Karachi and Hyderabad, Pakistan. Moreover, there is insufficient knowledge about perceptions of architectural obstacles by users and the effect of those obstacles on accessibility in different public buildings. Through combining users' perceptions with the assessment of certain architectural aspects of accessibility, this study adds evidence which goes beyond the boundaries of geography and will help to develop better accessibility policies and approaches to designing public buildings.

Research Objectives

This study was intended to discover and analyse physical elements affecting the accessibility of public buildings, focusing on elements preventing movement and usability. This study is intended to analyse public buildings in the cities of Hyderabad and Karachi in respect to the availability and dimensions of ramps, elevators, sensors, and compliance with accessibility requirements. The research is intended to analyse how much public buildings comply with the Universal Design concept and possible

challenges users may face while using these buildings.

Significance of the Study

This research will shed light on Architectural barriers and their overall impact on accessibility within public structures. By analysing the effects of such barriers in terms of their physiological, safety, environmental, and design considerations, the research is hoped to proposed strategies to improve building design and functionality. Eventually, the research intends to offer recommendations for creating environments that allow access to every individual, regardless of mobility limitations, thereby fostering inclusive and user-friendly public spaces for all members of society.

Organisation of the Paper

This article is organised into six sections. Section one, Introduction, provided the background of the topic under study and the current problem under consideration, while defining study objectives and the significance of the study. Section two, literature review, sheds light on the available literature, highlighting gaps present in the research area. Section three, methods, explains the research design and tools along with the procedure of data collection for this study. Section four summarises the research data while presenting the results of the analyses applied to the collected data. Section five, discussion, explains the study findings in accordance with the aims and objectives of the study. Lastly, section six, conclusion, summarises the findings along with study implications and recommendations for future researchers.

LITERATURE REVIEW

Architectural Barriers

According to Goldsmith (2000), independent and comfortable access by people of different abilities is important. In most cases, architectural barriers result as a consequence of design decisions that mainly focus on efficiently providing accessibility to abled individuals at the expense of those with disabilities, older people, children, and temporarily disabled people. In many cases, architectural barriers are common in existing public structures that were not accessible during the design and construction phases.

Typical examples of architectural barriers include:

- Absence or improper design of ramps and slopes
- Narrow entrance doors and corridors
- Steps, non-slip or slippery floor surfaces
- Lack of handrails, tactile paving, and non-slip materials
- Weak signage and wayfinding systems
- Inadequate lighting and manoeuvring space
- Inaccessible toilets, seating areas, parking, and emergency exits

Such barriers limit mobility, orientation, safety, and dignity, often resulting in exclusion from essential public services and social participation (Goldsmith, 2000).

Accessibility and Inclusiveness

Inclusiveness as a concept is closely related to accessibility, universal design, and design for all. The real definition of inclusiveness means that it is the quality of aiming to include and integrate all people and groups in activities, organisations, political processes, etc., especially people who are disadvantaged or marginalised, who have suffered discrimination, or are living with disabilities. Today, we can read very often about inclusive design as a synonym for universal design or design for all. These different concepts mean the same thing, but they are used in different ways in different countries in the world. For example, the concept "inclusive design" is used in Great Britain, while in several European and Scandinavian countries, the concept "design for all" is commonly used. America, as the country where the concept "universal design" originated, uses the terms inclusive and universal is interchangeable (Eddy, 2017). Additionally, In Nigeria, even though there have been attempts at introducing the Discrimination against Persons with Disabilities (Prohibition) Act 2018, there is still the issue of accessibility barriers that exists. According to (Amucheazi & Nwankwo, 2020), there has been construction of public infrastructures like schools, hospitals, transport facilities and others without proper regard for the people with disabilities. Moreover, it is important to note that, while the law requires for accessibility features like ramps, lifts, and other mobility aids in public infrastructures, there have not been proper implementation and enforcement which therefore hinder the ability for persons with disabilities to access the public places (Amucheazi & Nwankwo, 2020).

In Turkey, (Çubıkcı, 2019) examined the accessibility of public buildings in Konya city which included the train station, training and research hospital and metropolitan municipality building. This was done using accessibility criteria which were set out according to the national legislation and universal design principles. This was done to look at access to, entry into and use of the public buildings. There was found to be major inadequacies in the implementation of the accessibility in Turkey despite the legislative frameworks put in place. Accessibility to public facilities is a fundamental human right that which enables inclusion in society. In a study undertaken in Khulna, Bangladesh, the facility accessibility of public buildings like educational institutions, governmental offices, hospitals, and banks for persons with physical disabilities was examined. While the accessibility features were introduced in the Government of Bangladesh (2008), these features were poorly implemented. Only 12% of the studied buildings had elevator access and ramps, although most multi-story public buildings did not have any elevators. Even though there was an admissions quota for disabled students, many government universities were not wheelchair accessible and none of the buildings had proper accessibility signboards. Out of the total 75 public buildings, only one hospital was fully wheelchair accessible, while seven additional buildings could achieve

accessibility with minor modifications. The study concluded that improvements such as installing appropriate signage, widening doorways, redesigning toilets and water closets, providing ramps with handrails, and ensuring access to drinking water facilities could substantially enhance accessibility for people with physical disabilities (Farzana, 2018). Another case study conducted in Nepal revealed similar findings. The accessibility of both new and old buildings was assessed using eighty-five indicators related to lifts, elevators, railings, ramps, stairs, entry, doors, parking, restrooms, and corridors. Most of the public buildings did not fully conform to the required measures for ensuring accessibility to people with disabilities. Suitable facilities to bring comfort to the disabled individuals were not available. Those public buildings that were newly constructed were comparatively more compliant. Accessibility was found to be highest in a public school. A hospital was seventy-five percent compliant owing to the fact that it was relatively old, with no renovations and poor maintenance. The lowest accessibility percentage was reported to be around forty-four percent. Such studies serve as a guide to urban planners, engineers, and architects to design considering the factors of accessibility, inclusivity, and safety of all kinds of public (Nakarmi & Shrestha, 2022).

Public Buildings and Architectural Barriers

Public buildings play a crucial role in community life, yet accessibility remains a persistent challenge, particularly for individuals with disabilities (Burns et al., 2024; Fuentes-del-Burgo et al., 2021). Despite this, universal design principles aim at creating spaces that people from all backgrounds and age groups can access (Olodeoku et al., 2024), but architectural barriers such as stairways, irregular surfaces, difficult entrance access, poor lighting, and lack of handrails remain common (Carlsson et al., 2022; Hammel et al., 2015). Research conducted in Ghana (Kportufe), Turkey (Baris & Uslu, 2009), and Zambia (Chilufya) has found that architecture is a major impediment to mobility, autonomy, and participation in society for people with impairments. This has led to exclusion and a lack of dignity for people with impairments (Baris & Uslu, 2009; Chilufya, 2013; Kportufe, 2015). Pakistan, despite the legislation in existence, along with an increase in awareness about these issues at the global level, there have been no comprehensive assessments of current structures at the architectural level. This marked deficiency in implementation indicates that an acute need exists for assessments to be based on realities. Such an assessment would be useful for implementing SDG 10 and SDG 11, which both align with reducing inequality and ensuring access to safe spaces.

Table 1 presents a synthesis of the important architectural barriers to universal accessibility in public buildings that were reported within recent international literature. The table indicates the physical

and environmental barriers that limit the independent use of buildings on the part of people with disabilities, older people, and other members. All the barriers reported have at least three scholarly publications within peer-reviewed journals. The observation indicates that problematic entrance design, ill-functional circulation, non-functional ramps, and lacking supportive aspects still feature significantly. Overall, the literature emphasises the need for comprehensive implementation of universal design principles to enhance accessibility and user satisfaction in existing public buildings.

Table 1
Literature-based synthesis of architectural barriers influencing accessibility in public buildings

Architectural Barriers	Citation (Author, year)
Easily identifiable entrance	Chidiac and Reda (2025); Marín et al. (2023); and Olodeoku et al. (2024)
Free from obstacles	Carlsson et al. (2022); Burns et al. (2024); and Olodeoku et al. (2024)
Ramps and slopes for users	Anunobi et al. (2015); Nakarmi and Shrestha (2022); and Chidiac and Reda (2025)
Appropriate to use ramps	Anunobi et al. (2015); Burns et al. (2024); and Olodeoku et al. (2024)
Wide entrance doors	Carlsson et al. (2022); Burns et al. (2024); and Marín et al. (2023)
Well-designed entrance	Chidiac and Reda (2025); Marín et al. (2023); and Olodeoku et al. (2024)
Clear signs of ramps and elevators	Baris and Uslu (2009); Marín et al. (2023); and Burns et al. (2024)
Space for manoeuvring	Carlsson et al. (2022); Burns et al. (2024); and Olodeoku et al. (2024)
Automatic doors	Duman and Uzunoğlu (2021); Burns et al. (2024); and Chidiac and Reda (2025)
Handrails for support	Anunobi et al. (2015); Nakarmi and Shrestha (2022); Chidiac and Reda (2025)
Seating area	Chilufya (2013); Olodeoku et al. (2024); and Burns et al. (2024)
Emergency evacuation	Chidiac and Reda (2025); Burns et al. (2024); and Carlsson et al. (2022)
Security personnel	Carlsson et al. (2022); Burns et al. (2024); and Olodeoku et al. (2024)
Parking for senior citizens	Olodeoku et al. (2024); Burns et al. (2024); and Marín et al. (2023)
Even, non-slip surfaces	Olodeoku et al. (2024); Burns et al. (2024); and Nakarmi and Shrestha (2022)
Public transport stops near the entrance	Levison and Wu (2024) ; Marín et al. (2023); and Carlsson et al. (2022)
Absence of even, non-slip surfaces	Olodeoku et al. (2024); Burns et al. (2024); and Nakarmi and Shrestha (2022)
Adequate lighting	Kportufe (2015); Olodeoku et al. (2024); and Burns et al. (2024)
Overall satisfaction with accessibility	Carlsson et al. (2022); Burns et al. (2024); and Chidiac and Reda (2025)

Public buildings represent a major share of the real estate market overall (Fuentes-del-Burgo et al., 2021) and should be open to accessibility for every person living in the community (Burns et al., 2024). The achievement of accessibility could be difficult, as sometimes the issue related to accessibility is not thoroughly considered during the building design (Burns et al., 2024). Universal design passes the standard requirements for buildings to be fully accessible to everyone. The goal of universal design is to provide accommodations for people without considering age, gender, culture, ability, or disabilities. There are diverse quality parameters dealing with universal design, covering social, physical, security, as well as private parameters, along with the requirements for navigation, understanding, environmental conditions, comfort, well-being, and social participation requirements (Olodeoku et al., 2024). Accessibility refers to the ability to make the environment usable fully by the target users generally. The availability or lack of accessibility of the built environment either facilitates or obstructs users, depending on the degree to which the users can accomplish the desired or necessary activities (Olodeoku et al., 2024). Many factors can result in the lack of accessibility. Architectural barriers are one of them. It refers to an environmental and/or physical barrier that limits the entrance to a site or a building for some people. But the actual environmental factors that act as a barrier to accessibility depend on the functional limitation of the person. For instance, factors such as stairs and steps can be a barrier to people using wheelchairs, but this is not the case for people with hearing impairments. On the contrary, hearing-impaired people have different environmental issues to withstand, such as the absence of visual information in an auditory environment. As such, the issue of accessibility is relative, and it is described by the interaction of a person's functional capabilities and the needs of the physical environment (Carlsson et al., 2022).

It is often difficult for professionals to navigate the complexities involved in designing accessible spaces. Even a single environmental element (such as the absence of a ramp, visual indicators, or hearing loops) can be sufficient to restrict an individual's activities. While removing barriers in the built environment is important, it does not address every individual's needs (Hammel et al., 2015). It is because the functional capacity of individuals varies throughout life and typically declines with age. It leads to more frequent functional limitations. These limitations reflect reduced ability to perform essential physical and mental tasks required for daily living (Carlsson et al., 2022).

Consequently, it is very important that an environment where access barriers do not exist is created to ensure that all individuals, irrespective of their level of ability, can have equal access to the built environment. Therefore, accessibility can be increased with well-informed urban planning to enhance the built environment in a way that fosters inclusivity and engagement from all members of the community (Levison & Wu, 2024; MacDonald, 2024).

Research conducted in Ghana in the context of the accessibility of disabled people to public buildings concluded that public buildings are not designed from a disabled people's perspective. Approximately 80% of people complained about access, floor, corridors, etc., because a lift or ramp for disabled people is not available for access to the building facilities. Most people complained about the lack of light in the building (Kportufe, 2015). Research work was also done in Turkey, focusing on vision-impaired people and people with mobility disabilities. It was also concluded in the research that disabled people encounter many physical barriers while trying to access buildings. These physical barriers in the urban environment restrict a person's freedom of movement, hence inhibiting social communication, culminating in social exclusion or isolation (Baris & Uslu, 2009).

Chilufya (2013) interviewed to evaluate the public buildings of Lusaka, Zambia. The data showed that these buildings do not include ramps, lifts, handrails, accessible restrooms, and other facilities, without which any person with disabilities cannot navigate a building consistently or with ease. This has resulted in various practical problems that are humiliating for the senior or disabled individuals to access the services located in those buildings. Consequently, it is a question of their equality rights and human dignity. In contrast, several developed countries have successfully addressed accessibility challenges by embedding inclusive design principles into legislation, building regulations, and planning policies. In the United States, the Americans with Disabilities Act (ADA) of 1990 and the 2010 ADA Standards for Accessible Design mandate accessible entrances, ramps, elevators, parking spaces, toilets, signage, and circulation routes in public buildings, with compliance enforced through legal mechanisms (U.S. Department of Justice, 2010). To evaluate the public buildings' situation in Pakistan, this research was designed to find out the architectural barriers linked to public buildings' accessibility in Sindh province, and the facilitation design of these facilities in the face of challenges presented by individuals.

Despite countries' legislation and the international community's understanding of inclusive design, no detailed building-level assessment has been done in these civic buildings for the main metropolitan cities in the region. These buildings serve thousands of citizens on a daily basis. It would provide an innovative contribution to the existing body of knowledge to address the gap in accessibility in civic buildings, specifically in Karachi and Hyderabad, for the first time, using the perspective of accessibility for the buildings 'Shahbaz Building' in Hyderabad, 'Civic Centre' in Karachi, Pakistan. Rather than exploring legislation about accessibility in buildings, the issue would address barriers for both differently abled citizens, as well as abled ones, in these civic buildings. It would provide an idea about the gap in terms of implementing by-laws about accessibility to assist in addressing the gap that remains in policy, rather than

practice, for the sake of sustainable social inclusion in Pakistani urban governance. Sustainable Development Goals (SDGs) also promote equality and inclusivity. For example, SDG 10, inequality reduction, and its sub-points focus on limiting all types of inequality, including those based on sex, ethnicity, race, religion, economics, or even disability. With reference to equality for people with disabilities, this goal promotes equitable access to civic services and infrastructure for persons with disabilities, along with people who are fully able and functional. Moreover, SDG 11 of "Sustainable Cities and Communities" also focuses on promoting inclusion, resilience, and safety for individuals from all backgrounds. Furthermore, the 11.7 target of this SDG emphasises universal access to safe, inclusive, and accessible public spaces. Therefore, the aim is to ensure ease, accessibility, equality, and inclusivity for all (United Nations, 2015).

METHODS

Research Design

This study employed a cross-sectional study design to assess the Architectural barriers in three public buildings located in Sindh province, Pakistan. A total of 1000 people were recruited in the study using a non-probability convenience sampling technique.

Participants

The participants were frequent visitors of Civic Centre Karachi (n = 500), Shahbaz Building Hyderabad (n = 250), and Civic Centre Hyderabad (n = 250), Pakistan.

Study Tool

The study utilised a structured questionnaire consisting of two sections. Section I (Demographic Information) comprised eight questions that collected respondents' background characteristics, including gender, age, marital status, physical disability or mobility challenges, frequency of visits to public buildings, purpose of visit, frequency of visits to the selected public building, and mode of transport. Section II (Physical Barriers to Ingress Accessibility) consisted of 19 indicators assessing users' perceptions of the physical accessibility of public building entrances. The indicators evaluated various aspects of ingress accessibility, including entrance visibility, obstacle-free pathways, ramps and slopes, door width, entrance safety, accessibility signage, manoeuvring space, lighting, automatic doors, handrails, seating facilities, emergency evacuation information, staff assistance, designated parking, even, non-slip surfaces, accessibility from public transportation, and visitors' satisfaction with entrance accessibility. All indicators were measured using a 5-point Likert scale, ranging from 1 = Strongly Disagree to 5 = Strongly Agree. The face and content validity of the tool was done by field experts, and the reliability analysis was also conducted. The reliability coefficient of the tool indicated excellent internal consistency ($\alpha = .958$).

Study Procedure and Ethical Considerations

The visitors were approached and were asked to participate in the study voluntarily. The agreed visitors gave written consent and completed the questionnaire.

Data Analysis

The collected questionnaires were coded and entered into statistical software SPSS version 26, and the results were analysed. Frequency distribution, means, and standard deviations were calculated to assess the responses. To determine the association between the indicators, Chi-square tests were utilised.

RESULTS

Demographic Profile of Participants

Table 2 shows the demographic characteristics of visitors to three different public buildings. Out of 500 Civic Centre Karachi visitors, seventy percent were males, and almost 31% were aged between 41 and 50 years. Around 80% of the visitors were married. Almost three-fourths of them had no physical disability. Three-fifths of the visitors visit this centre daily, and 63.6% have jobs in this centre, while 25% visit for information. Lastly, more than forty percent of the people use a car as the mode of transport, and 38.2% use a motorcycle. Out of 250 visitors of the Shahbaz building and Civic centre Hyderabad, more than seventy percent of the participants were males, more than one-third were 51-60 years old, and almost two-thirds were married. Around 70% of the visitors had no physical disability. More than 55% of the people visit these buildings daily for work. Lastly, the most frequently used mode of transport is the motorcycle by more than 43% of people, and one-fourth of people use public transport to visit these two buildings.

Table 2
Demographic profile of visitors

Indicators	Responses	Civic Centre Karachi N = 500 n (%)	Shahbaz Building Hyderabad N = 250 n (%)	Civic Centre Hyderabad N = 250 n (%)
Gender	Male	353 (70.6)	181 (72.4)	177 (70.8)
	Female	147 (29.4)	69 (27.6)	73 (29.2)
Age	20-30	41 (8.2)	37 (14.8)	37 (14.8)
	31-40	92 (18.4)	56 (22.4)	53 (21.2)
	41-50	154 (30.8)	50 (20.0)	51 (20.4)
	51-60	126 (25.2)	89 (35.6)	91 (36.4)
	Above 60	87 (17.4)	18 (7.2)	18 (7.2)
Marital status	Single	52 (10.4)	59 (23.6)	59 (23.6)
	Married	399 (79.8)	159 (63.6)	159 (63.6)
	Divorced	4 (0.8)	25 (10.0)	25 (10.0)
	Widowed	45 (9.0)	7 (2.8)	7 (2.8)

Table 2 (*continued*)

Indicators	Responses	Civic Centre Karachi N = 500 n (%)	Shahbaz Building Hyderabad N = 250 n (%)	Civic Centre Hyderabad N = 250 n (%)
Physical disability	Yes	131 (26.2)	74 (29.6)	77 (30.8)
	No	369 (73.8)	176 (70.4)	173 (69.2)
Frequency of visits to public buildings	Daily	302 (60.4)	141 (56.4)	141 (56.4)
	Weekly	52 (10.4)	49 (19.6)	49 (19.6)
	Monthly	117 (23.4)	45 (18.0)	45 (18.0)
	Rarely	29 (5.8)	15 (6.0)	15 (6.0)
Frequency of visits to this centre	Daily	302 (60.4)	141 (56.4)	141 (56.4)
	Weekly	32 (6.4)	49 (19.6)	49 (19.6)
	Monthly	137 (27.4)	45 (18.0)	45 (18.0)
	Rarely	29 (5.8)	15 (6.0)	15 (6.0)
Reason to visit	For job	318 (63.6)	141 (56.4)	141 (56.4)
	For information	125 (25.0)	84 (33.6)	84 (33.6)
	Other	57 (11.4)	25 (10.0)	25 (10.0)
Mode of transport	Walk	25 (5.0)	28 (11.2)	28 (11.2)
	Motorcycle	191 (38.2)	111(44.4)	108 (43.2)
	Car	212 (42.2)	49 (19.6)	51 (20.4)
	Public transport	72 (14.4)	62 (24.8)	63 (25.2)

Note. n = 1000 visitors

Normality Testing

The normality of the architectural barriers tool was assessed using the Shapiro-Wilk test. The result indicated that the scores were not normally distributed, $W = .76$, $p < .001$, with skewness = 1.87 ± .08, and kurtosis = 3.23 ± .16, suggesting a positively skewed and leptokurtic distribution. This reflects that barrier scores are concentrated towards the lower end of the scale with long tails on the right side than a normally distributed data (Figure 1).

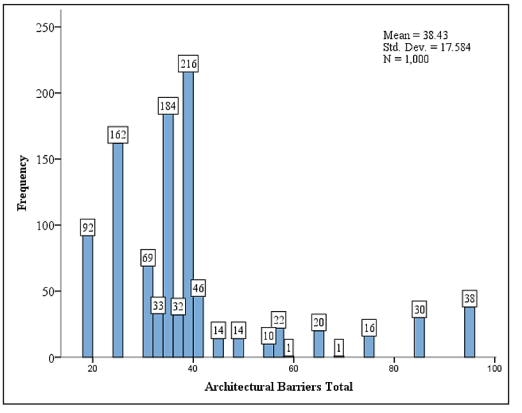

Figure 1. Histogram showing the distribution of architectural barriers scores

Factor Analysis of the Architectural barriers

A Principal Component Analysis (PCA) was conducted on the 19 items of the architectural barriers tool to explore the underlying factor structure. Inspection of the correlation matrix revealed that all items have adequate factor loadings, i.e., ≥ .80. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was .79, and Bartlett's Test of Sphericity was statistically significant, χ^2 (171) = 39034.92, $p < .001$, indicating the suitability of factor analysis.

Initial eigenvalues and scree plot (Figure 2) revealed two factors having eigenvalues above 1, explaining 73.15% and 10.18% of the variance, respectively. The factors explained 83.33% of the overall variance. As the scale items were interconnected, a Promax rotation was performed.

The rotated solution revealed that factor 1 (identifiable entrance, appropriate ramps, automatic doors, emergency evacuation, parking, etc.) reflected structure-related barriers, and factor 2 (non-slip surface and adequate lighting) reflected visibility barriers (Table 3). The two factors were weakly correlated ($r = .10$).

Table 3
Factor analysis of the architectural barriers identified from the study

Architectural Barriers Tool Items	Factor Loadings	
	1	2
Factor 1		
Easily identifiable Entrance	.88	.21
Free from obstacles	.94	.04
Ramps and slopes for users	.85	.00
Appropriate to use ramps	.88	-.02
Wide entrance doors	.95	-.12
Well-designed entrance	.89	.00
Clear signs of ramps and elevators	.87	-.02
Space for manoeuvring	.94	-.07
Automatic doors	.94	-.02
Handrails for support	.81	.20
Seating area	.96	.00
Emergency evacuation	.94	.00
Security personnel	.91	.09
Parking for senior citizens	.81	-.11
Even, non-slip surfaces	.96	-.03
Public transport stops near the entrance	.90	.00
Overall satisfaction with accessibility	.89	-.11
Factor 2		
Absence of even, non-slip surfaces	.08	.94
Adequate lighting	-.11	.96

Note. n = 1000 visitors

A Principal Component Analysis (PCA) was conducted on the 19 items of the architectural barriers tool to explore the underlying factor structure. Inspection of the correlation matrix revealed that all items have adequate factor loadings, i.e., ≥ .80. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was .79, and Bartlett's Test of Sphericity was statistically significant, χ^2 (171) = 39034.92, p < .001, indicating the suitability of factor analysis. Initial eigenvalues and scree plot (Figure 2) revealed two factors having eigenvalues above 1, explaining 73.15% and 10.18% of the variance, respectively. The factors explained 83.33% of the overall variance. As the scale items were interconnected, a Promax rotation was performed. The rotated solution revealed that factor 1 (identifiable entrance, appropriate ramps, automatic doors, emergency evacuation, parking, etc.) reflected structure-related barriers, and factor 2 (absence of even, non-slip surfaces and adequate lighting) reflected visibility barriers. The two factors were weakly correlated (r = .10).

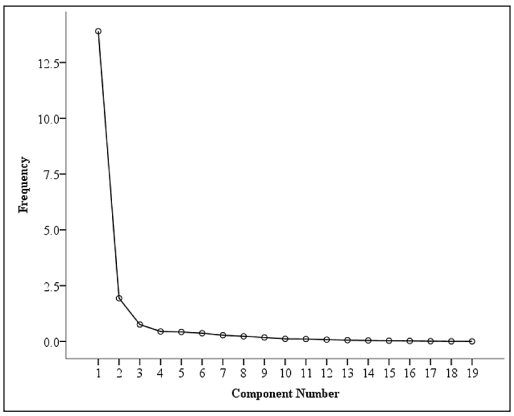

Figure 2. Scree plot

Physical Factors Impacting the Public Accessibility

Most of the visitors of the Civic Centre Karachi reported disagreement on the easy accessibility of the entrance and the facilities available. However, nearly three-fourths of the respondents agreed that there were no physical barriers like steps or even, non-slip surfaces in the entrance area, and around 65% reported that the lighting was adequate, ensuring safety and visibility (Table 4).

Most of the visitors of the Shahbaz Building, Hyderabad, disagreed with the easy accessibility of the entrance, the ramps, design, signs, space for manoeuvring, seating area, handrails, etc. Nevertheless, 60% of the visitors reported the absence of physical barriers in the entrance area, with a mean response of 3.39 ± 1.52. In addition, half of the visitors agreed on adequate lighting in the entrance area (Table 5).

The responses of visitors regarding Civic Centre Hyderabad were between Mean ± S.D 1.81 ± 1.17 to 2.23 ± 1.05 for most of the indicators, like wide entrance doors, appropriate ramps, clear signs, automatic doors, space for manoeuvring, etc. These responses depict overall disagreement regarding the accessibility of the entry. Like the other two buildings, the response of visitors regarding the absence of physical barriers and lighting was better, in which Mean ± S.D 1.70 ± 1.08 and Mean ± S.D 1.76 ± 1.08 people agreed, respectively (Table 6).

Table 4
Physical factors impacting the accessibility of the entry to the Civic Centre, Karachi

Indicators	Strongly Disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly Agree n (%)	Mean ± *SD*
Easily identifiable Entrance	321 (64.2)	95 (19.0)	32 (6.4)	22 (4.4)	30 (6.0)	1.69 ± 1.15
Free from obstacles	206 (41.2)	210 (42.0)	34 (6.8)	20 (4.0)	30 (6.0)	1.92 ± 1.08
Ramps and slopes for users	209 (41.8)	147 (29.4)	94 (18.8)	20 (4.0)	30 (6.0)	2.03 ± 1.14
Appropriate to use ramps	231 (46.2)	152 (30.4)	65 (13.0)	22 (4.4)	30 (6.0)	1.94 ± 1.14
Wide entrance doors	294 (58.8)	122 (24.4)	34 (6.8)	20 (4.0)	30 (6.0)	1.74 ± 1.14
Well-designed entrance	307 (61.4)	96 (19.2)	46 (9.2)	21 (4.2)	30 (6.0)	1.74 ± 1.16
Clear signs of ramps and /or Elevators	286 (57.2)	130 (26.0)	33 (6.6)	21 (4.2)	30 (6.0)	1.76 ± 1.14
Absence of even, non-slip surfaces	45 (9.0)	43 (8.6)	36 (7.2)	258 (51.6)	118 (23.6)	3.72 ± 1.18
Space for manoeuvring	288 (57.6)	122 (24.4)	33 (6.6)	27 (5.4)	30 (6.0)	1.78 ± 1.16
Adequate lighting	45 (9.0)	11 (2.2)	121 (24.2)	252 (50.4)	71 (14.2)	3.59 ± 1.06
Automatic doors	288 (57.6)	128 (25.6)	32 (6.4)	22 (4.4)	30 (6.0)	1.76 ± 1.14
Handrails for support	274 (54.8)	142 (28.4)	33 (6.6)	21 (4.2)	30 (6.0)	1.78 ± 1.13
Seating area	326 (65.2)	90 (18.0)	33 (6.6)	21 (4.2)	30 (6.0)	1.68 ± 1.15
Emergency evacuation	247 (49.4)	169 (33.8)	33 (6.6)	21 (4.2)	30 (6.0)	1.84 ± 1.12
Security personnel	334 (66.8)	82 (16.4)	32 (6.4)	322 (4.4)	30 (6.0)	1.66 ± 1.16
Parking for senior citizens	301 (60.2)	69 (13.8)	65 (13.0)	35 (7.0)	30 (6.0)	1.85 ± 1.24
Even, non-slip surfaces	274 (54.8)	136 (27.2)	39 (7.8)	21 (4.2)	30 (6.0)	1.79 ± 1.14
Public transport stops near the entrance	324 (64.8)	89 (17.8)	36 (7.2)	21 (4.2)	30 (6.0)	1.69 ± 1.16
Visitors' satisfaction with accessibility	328 (65.6)	95 (19.0)	31 (6.2)	16 (3.2)	30 (6.0)	1.65 ± 1.13

Note. n = 500 Visitors

Table 5
Physical factors impacting the accessibility of the entry to the Shahbaz Building, Hyderabad

Indicators	Strongly Disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly Agree n (%)	Mean ± *SD*
Easily identifiable Entrance	55 (22.0)	165 (66.0)	7 (2.8)	15 (6.0)	8 (3.2)	2.02 ± 0.88
Free from obstacles	93 (37.2)	117 (46.8)	17 (6.8)	8 (3.2)	15 (6.0)	1.94 ± 1.05
Ramps and slopes for users	84 (33.6)	129 (51.6)	7 (2.8)	22 (8.8)	8 (3.2)	1.96 ± 1.00
Appropriate to use ramps	135 (54.0)	86 (34.4)	7 (2.8)	7 (2.8)	15 (6.0)	1.72 ± 1.07
Wide entrance doors	150 (60.0)	67 (26.8)	10 (4.0)	15 (6.0)	8 (3.2)	1.66 ± 1.03
Well-designed entrance	44 (17.6)	173 (69.2)	10 (4.0)	8 (3.2)	15 (6.0)	2.11 ± 0.94
Clear signs of ramps and /or Elevators	116 (46.4)	92 (36.8)	20 (8.0)	7 (2.8)	15 (6.0)	1.85 ± 1.09
Absence of even, non-slip surfaces	37 (14.8)	60 (24.0)	10 (4.0)	55 (22.0)	88 (35.2)	3.39 ± 1.52
Space for manoeuvring	143 (57.2)	77 (30.8)	8 (3.2)	7 (2.8)	15 (6.0)	1.70 ± 1.08
Adequate lighting	37 (14.8)	85 (34.0)	0 (0.0)	27 (10.8)	101 (40.4)	3.28 ± 1.61
Automatic doors	126 (50.4)	94 (37.6)	7 (2.8)	15 (6.0)	8 (3.2)	1.74 ± 1.00
Handrails for support	79 (31.6)	130 (52.0)	18 (7.2)	15 (6.0)	8 (3.2)	1.97 ± 0.96
Seating area	128 (51.2)	92 (36.8)	7 (2.8)	8 (3.2)	15 (6.0)	1.76 ± 1.08
Emergency evacuation	94 (37.6)	123 (49.2)	10 (4.0)	8 (3.2)	15 (6.0)	1.91 ± 1.04
Security personnel	79 (31.6)	141 (56.4)	7 (2.8)	8 (3.2)	15 (6.0)	1.96 ± 1.01
Parking for senior citizens	102 (40.8)	115 (46.0)	10 (4.0)	15 (6.0)	8 (3.2)	1.85 ± 0.98
Even, non-slip surfaces	135 (54.0)	85 (34.0)	7 (2.8)	8 (3.2)	15 (6.0)	1.73 ± 1.08
Public transport stops near entrance	126 (50.4)	94 (37.6)	7 (2.8)	8 (3.2)	15 (6.0)	1.77 ± 1.07
Visitors' satisfaction with accessibility	139 (55.6)	78 (31.2)	10 (4.0)	15 (6.0)	8 (3.2)	1.70 ± 1.02

Note. n = 250 Visitors

Table 6
Physical factors impacting the accessibility of the entry to the Civic Centre, Hyderabad

Indicators	Strongly Disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly Agree n (%)	Mean ± *SD*
Easily identifiable Entrance	48 (19.2)	164 (65.6)	7 (2.8)	15 (6.0)	16 (6.4)	2.15 ± 1.01
Free from obstacles	86 (34.4)	116 (46.4)	17 (6.8)	8 (3.2)	23 (9.2)	2.06 ± 1.17
Ramps and slopes for users	69 (27.6)	136 (54.4)	7 (2.8)	22 (8.8)	16 (6.4)	2.12 ± 1.11
Appropriate to use ramps	120 (48.0)	93 (37.2)	7 (2.8)	7 (2.8)	23 (9.2)	1.88 ± 1.20
Wide entrance doors	135 (54.0)	74 (29.6)	10 (4.0)	15 (6.0)	16 (6.4)	1.81 ± 1.17
Well-designed entrance	37 (14.8)	172 (68.8)	10 (4.0)	8 (3.2)	23 (9.2)	2.23 ± 1.05
Clear signs of ramps and/or Elevators	101 (40.4)	99 (39.6)	20 (8.0)	7 (2.8)	23 (9.2)	2.01 ± 1.20
Absence of even, non-slip surfaces	30 (12.0)	67 (26.8)	10 (4.0)	55 (22.0)	88 (35.2)	3.42 ± 1.49
Space for manoeuvring	128 (51.2)	84 (33.6)	8 (3.2)	7 (2.8)	23 (9.2)	1.85 ± 1.21
Adequate lighting	30 (12.0)	92 (36.8)	0 (0.0)	27 (10.8)	101 (40.4)	3.31 ± 1.58
Automatic doors	111(44.4)	101 (40.4)	7 (2.8)	15 (6.0)	16 (6.4)	1.90 ± 1.13
Handrails for support	72 (28.8)	129 (51.6)	18 (7.2)	15 (6.0)	16 (6.4)	2.10 ± 1.08
Seating area	113 (45.2)	99 (39.6)	7 (2.8)	8 (3.2)	23 (9.2)	1.92 ± 1.20
Emergency evacuation	87 (34.8)	122 (48.8)	10 (4.0)	8 (3.2)	23 (9.2)	2.03 ± 1.16
Security personnel	72 (28.8)	140 (56.0)	7 (2.8)	8 (3.2)	23 (9.2)	2.08 ± 1.13
Parking for senior citizens	95 (38.0)	114 (45.6)	10 (4.0)	15 (6.0)	16 (6.4)	1.97 ± 1.11
Even, non-slip surfaces	120 (48.0)	92 (36.8)	7 (2.8)	8 (3.2)	23 (9.2)	1.89 ± 1.21
Public transport stops near entrance	111(44.4)	101 (40.4)	7 (2.8)	8 (3.2)	23 (9.2)	1.92 ± 1.20
Visitors' satisfaction with accessibility	124 (49.6)	85 (34.0)	10 (4.0)	15 (6.0)	16 (6.4)	1.86 ± 1.16

Note. n = 250 Visitors

Table 7
Chi-square tests of three public buildings

Indicators	Civic Centre Karachi		Shahbaz Building Hyderabad		Civic Centre Hyderabad	
	χ^2 (16)	*p*	χ^2 (16)	*p*	χ^2 (16)	*p*
Slopes for users × Wide entrance doors	1384.98	<.001***	508.77	<.001***	503.30	<.001***
Automatic doors × Overall satisfaction	964.55	<.001***	628.65	<.001***	629.58	<.001***
Appropriate to use ramps × Space for manoeuvring	1211.95	<.001***	718.29	<.001***	717.80	<.001***

Note. n = 1000 Visitors

Table 7 represents the results of the Chi-square tests for three public buildings. A significant association was found between the presence of ramps or slopes for users and wide entrance doors with $p < .001$, which means that in the building architecture, wide doors should be constructed if there is an associated ramp. There was also a significant association between automatic doors for entry and exit and the overall satisfaction of the visitors ($p < .001$), which depicts that automatic doors improve the overall satisfaction regarding the building accessibility. Lastly, it was found that appropriate ramps and space for manoeuvring were significantly associated ($p < .001$).

Association of Different Factors Impacting the Accessibility

Overall, the findings extend beyond descriptive statistics by incorporating reliability and inferential statistical analyses to provide a comprehensive assessment of architectural accessibility. The internal consistency of the questionnaire was confirmed by an excellent Cronbach's alpha coefficient ($\alpha = .958$). The suitability of the data for factor analysis was established through the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's Test of Sphericity. Principal Component Analysis (PCA) with Promax rotation identified two underlying dimensions of architectural barriers, namely structure-related barriers and visibility barriers. Furthermore, chi-square analyses revealed statistically significant associations between ramps and wide entrance doors, automatic doors and overall user satisfaction, and appropriate ramps and manoeuvring space across all three public buildings (all $p < .001$). These findings demonstrate that accessibility is influenced by interrelated architectural features rather than isolated design elements, providing robust empirical evidence to support accessibility planning, Universal Design implementation, and evidence-based policy development.

DISCUSSION

Use of public facilities is a common practice in the community. The extent of their

utilisation determines the accessibility of these public spaces and buildings. As a result, universal design and ease of access are considered significant in such architectural planning to serve people with different abilities equitably. As public spaces serve individuals with diverse abilities, their physical features must ensure ease of access and movement for everyone. Features such as ramps, doors, floor surfaces, and signage play a direct role in shaping how individuals perceive and navigate these areas. Evaluation of these features in public buildings offers valuable insight into the effectiveness of the existing infrastructure and whether it supports accessibility and universal usability in real-world settings. The findings demonstrate that architectural barriers continue to restrict equitable access to public buildings despite the availability of accessibility regulations and Universal Design principles. The results indicate that deficiencies in ramps, entrances, circulation space, signage, automatic doors, handrails, and parking facilities remain widespread across the three public buildings investigated.

The results shows that demographic profile of the respondents, indicating that the accessibility perceptions reported in this study primarily reflect the experiences of predominantly male, married, middle-aged visitors with Around one-third of the visitors at the Civic Centre, Karachi, were between the ages of forty-one to fifty years. Similarly, approximately one-third of the visitors at the Shahbaz building and the Civic Centre Hyderabad had an age of fifty-one to sixty years. Moreover, in all three buildings, around thirty percent of the participants reported having physical disabilities.

The results regarding physical barriers from all three buildings showed that out of all the barriers, the two least common barriers reported by the study respondents were the even, non-slip surfaces at the entrance and lighting. These findings are consistent with previous research conducted in Nepal on public buildings (Nakarmi & Shrestha, 2022). As countries work towards equality, fairness, diversity, and inclusion, it is also essential to establish accessible environments, including public facilities (Chidiac & Reda, 2025).

Moreover, the mean scores indicated that respondents perceived the entrances as not being well-designed, easily identifiable, or free from obstacles, and they also perceived the provision of ramps and appropriate slopes as inadequate. The entrance doors were narrow, with the unavailability of automatic doors and handrails for support, and non-slip surface flooring. There was no clear signage of ramps and elevators. Space for manoeuvring, seating area, parking for senior citizens, emergency evacuation, and security personnel were limited in the public buildings under consideration. Moreover, public transport stops near the entrance were also missing. These barriers were the most commonly perceived across all three buildings, consistent with the findings of (Kportufe, 2015), who reported that inaccessible entrances, inadequate ramps, and other physical barriers were common accessibility challenges in public buildings.

The study found that architectural barriers hinder accessibility for individuals with differing needs. Their results showed that architectural and physical barriers related to access, undetectable obstacles, signage, door mechanisms, staircases, ramps, and many others exist in more than three-fourths of the 25 public buildings (Marín et al., 2023).

Furthermore, the results of the Chi-square tests showed a significant association between the wide entrance doors and the presence of ramps or slopes for three public buildings. This signifies that wide doors should be constructed when there are associated ramps at the entrance of the buildings. The entrance doors with ramps must be wider, given their numerous uses. A ramp is suitable for individuals who struggle with stairs for numerous reasons, whether for carrying heavy items between floors, using a stroller for a child, or due to a physical limitation and or disability. The presence of both stairs and ramps enables individuals to select the option that meets their specific requirements, leading to a more adaptable, versatile, and universally accessible design. This clarifies the benefits of ramps in public architecture. Moreover, ramps, whether external or internal, must be carefully designed to ensure they provide genuine practical value. The ramps should have a clear width greater than 1050mm. Likewise, the door widths that are associated with ramps should ideally be no less than 1000 mM (Anunobi et al., 2015).

Additionally, automatic building doors have a significant association with overall visitor satisfaction and tend to improve overall satisfaction regarding building accessibility. This is possibly because automatic sliding doors have an impact on a building's appearance, user experience, and accessibility. They offer both practical advantages and aesthetic appeal while conserving space and allowing for more adaptable layouts. Their smooth operation and space-efficient nature contribute to a positive user experience while enhancing accessibility for individuals using mobility aids. This also increases the public's satisfaction levels. They facilitate hands-free entry and exit, making movement easy. A large number of people can pass through them efficiently, which also minimises the risk of germ transmission, ensuring a healthy environment. Therefore, their design, being space-efficient, energy-saving, and user-friendly, makes them an excellent choice for public buildings that prioritise visitor convenience. This makes circulation easier for all kinds of users (Duman & Uzunoğlu, 2021). Nevertheless, a small amount of literature is available in this regard, particularly with respect to visitor satisfaction with automatic doors in public buildings.

Lastly, an association between manoeuvring space and appropriate ramps was found. Ramps in public buildings that are poorly designed with steep angles, slippery surfaces, insufficient railings, unsuitable locations, and excessive lengths without landings can lead to issues with manoeuvrability and circulation. In these cases, individuals with physical challenges

may find these inadequately designed ramps inconvenient or difficult to use, often opting for stairs despite the associated risks when they are available. The U.S. Access Board (2015) emphasised that ramps, both exterior and interior, that connect different levels should be thoughtfully designed and constructed to provide genuine practical benefits. Running slopes greater than 1:12 can be dangerous even for individuals in good physical condition. Therefore, appropriate ramps with handrails should be designed (Anunobi et al., 2015).

CONCLUSION

Adapting or building accessible environments is not just a matter of convenience or preference; it is a matter of equal rights and accessibility, not just about people with disabilities, but it benefits everyone, including the elderly, parents with strollers, and people with temporary injuries. Therefore, creating accessible environments should be a priority for all developers and key actors involved in the proposal and creation of buildings and public spaces. The findings of the study demonstrated that public buildings had various barriers that affect the accessibility of people and their mobility. In this study, mobility is defined as the ability of individuals to move safely, independently, and efficiently within and around public buildings without being hindered by architectural barriers. Therefore, it is essential to recognise the importance of accessibility and work to create inclusive environments for everyone. This requires a shift in mindset, a commitment to accessibility standards, and the implementation of legislation and regulations that prioritise accessibility.

The findings demonstrate that major public buildings in Karachi and Hyderabad continue to contain numerous architectural barriers that restrict accessibility for persons with disabilities as well as other users, including older adults, parents with strollers, and individuals with temporary mobility limitations. The most prominent barriers identified include poorly designed entrances, ramps, narrow doors, insufficient manoeuvring space, lack of automatic doors, inadequate signage, limited seating, handrails, emergency evacuation facilities, and parking provisions. Although existing accessibility standards and Universal Design principles provide appropriate guidance, their implementation remains inadequate. Improving compliance with accessibility regulations, integrating Universal Design into future developments, and upgrading existing public infrastructure are essential for creating inclusive, equitable, and sustainable public environments that promote independent access for all members of society. Incorporating these guidelines can reduce the number of challenges. However, proposing standard solutions is challenging as each facility, and its requirements are distinct and unique.

IMPLICATION OF THE STUDY

One of the practical implications of this study is that it can be helpful for departments responsible for the built environment, as they can take steps to eliminate barriers that can

prevent individuals with varying abilities from engaging with the physical environment. This can lead to policy improvements by informing the development and revision of accessibility standards and design guidelines, as well as supporting the effective implementation of the *Building Code of Pakistan 2021*, particularly the accessibility provisions in Chapter 11, together with the *Accessibility Code of Pakistan* (Pakistan Engineering Council, 2006, 2021) and the relevant Sindh Building Control Authority regulations (Sindh Building Control Authority, 2002). This study can also help local government bodies re-analyse the compliance of public building on the standards put forward by these bodies to ensure public ease. This would re-emphasise the proper evaluation and monitoring of the infrastructure of buildings.

Furthermore, the findings of this research can be utilised by the organisations representing people with disabilities. They can highlight the importance of creating standards and norms for accessibility for all on government platforms, leading to consideration and /or amendments in construction and accessibility policies by reframing accessibility as a right of all. Moreover, in light of this study, professionals such as architects, construction engineers, planners, building inspectors, and others involved in designing and constructing the physical environment can especially include accessibility and universal design principles in their construction projects as a core element, instead of focusing on just beauty and cost-effectiveness.

LIMITATION AND RECOMMENDATIONS FOR FUTURE RESEARCH

This study has a few limitations that should be taken into consideration. As the study was cross-sectional in nature, it represents only a one-time association between the variables and cannot determine the cause and effect or longitudinal relationships. Additionally, the disabled participants who took part in the study were not asked whether their disability was congenital or acquired. Similarly, the conclusions cannot be drawn regarding the involvement of the participants in the community activities before disability. Lastly, as this study was conducted on a specific geographical location of two metropolitan cities in the Sindh province, generalising this study's findings to other regions should be done with caution.

The future research can focus on gathering data from individuals with disabilities and highlight their perspective about the public buildings. This step can generate valuable insights, as there can be differences in the observations and viewpoints of individuals with and without disabilities. In addition, researchers can expand the geographical location of the study and can also include other public spaces like bus and train stations, hospitals, etc., to improve the generalizability of findings.

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REFERENCES

Anunobi, A., Adedayo, O., Ayuba, P., Oyetola, S., & Godwin, O. (2015). An assessment of ramp designs as barrier-free accesses in public buildings in Abuja, Nigeria. *Humanities and Social Sciences*, *3*(2), 75-82. https://doi.org/10.11648/j.hss.20150302.12

Amucheazi, C., & Nwankwo, C. M. (2020). *Accessibility to infrastructure and disability rights in Nigeria: An analysis of the potential of the Discrimination Against Persons with Disability (Prohibition) Act 2018*. *Commonwealth Law Bulletin, 46*(4), 689-710. https://doi.org/10.1080/03050718.2020.1781674

Baris, M. E., & Uslu, A. (2009). Accessibility for the disabled people to the built environment in Ankara, Turkey. *African Journal of Agricultural Research*, *4*(9), 801-814.

Burns, S. P., Mendonca, R. J., & Smith, R. O. (2024). Accessibility of public buildings in the United States: a cross-sectional survey. *Disability & Society*, *39*(11), 2988-3003. https://doi.org/10.1080/09687599.2023.2239996

Carlsson, G., Slaug, B., Schmidt, S. M., Norin, L., Ronchi, E., & Gefenaite, G. (2022). A scoping review of public building accessibility. *Disability and Health Journal*, *15*(2), Article 101227. https://doi.org/10.1016/j.dhjo.2021.101227

Chidiac, S. E., & Reda, M. A. (2025). "True" accessibility barriers of heritage buildings. *Buildings*, *15*(9), Article 1528. https://doi.org/10.3390/buildings15091528

Chilufya, M. M. (2013). *Accessibility of public buildings to disabled persons* [Doctoral dissertation, University of Zambia]. UNZA Repository. https://dspace.unza.zm/server/api/core/bitstreams/b65bee5b-2fff-4cac-9bb9-3f8a10a2ac10/content

Çubıkcı, M. (2019). *Evaluation of accessibility for all in public buildings: Konya case* (Master's thesis, Middle East Technical University, Graduate School of Natural and Applied Sciences). https://hdl.handle.net/11511/43418

David, V. (2008). *How to build an accessible environment in developing countries: Manual# 1-Introduction & accessibility standards*. Handicap International France. https://miusa.globaldisabilityrightsnow.org/wpcontent/uploads/2016/03/Access_Standards.pdf

Duman, Ü., & Uzunoğlu, K. (2021). The importance of universal design for the disabled in public buildings: A public building in Northern Cyprus as a case study. *Civil Engineering and Architecture*, *9*(3), 690-707. https://doi.org/10.13189/cea.2021.090312

Eddy, M. B. (2017). *Universal accessibility: On the need of an empathy-based architecture* [Doctoral dissertation, Universitat Politècnica de Catalunya]. UPCommons. https://upcommons.upc.edu/entities/publication/79c24ee4-6f08-4cda-97c6-8525318e2cda

Fuentes-del-Burgo, J., Navarro-Astor, E., Ramos, N. M. M., & Martins, J. P. (2021). Exploring the critical barriers to the implementation of renewable technologies in existing university buildings. *Sustainability*, *13*(22), Article 12662. https://doi.org/10.3390/su132212662

Farzana, F. (2018). Accessibility of public buildings in Khulna, Bangladesh, for wheelchair users. *Disability, CBR & Inclusive Development, 29*(4), 83-97. https://doi.org/10.5463/DCID.v29i4.785

Government of Bangladesh. (2008). Bangladesh National Building Code (BNBC) (Part 3). Bangladesh Government Press

Goldsmith, S. (2000). *Universal design: A manual of practical guidance for architects*. Architectural Press.

Hammel, J., Magasi, S., Heinemann, A., Gray, D. B., Stark, S., Kisala, P., Carlozzi, N. E., Tulsky, D., Garcia, S. F., & Hahn, E. A. (2015).

Environmental barriers and supports to everyday participation: A qualitative insider perspective from people with disabilities. *Archives of Physical Medicine and Rehabilitation*, *96*(4), 578-588. https://doi.org/10.1016/j.apmr.2014.12.008

Hyderabad Development Authority. (n.d.). *Building Control Regulations.* Government of Sindh.

Kportufe, G. S. (2015). Assessment on the accessibility of public buildings and its facilities to the disabled in Ghana. *Civil and Environmental Research*, *7*(10), 78-90.

Levison, D., & Wu, H. (2024). Access, the built environment, and behavior. In D. Protoglou & J. Spinney (Eds.), *Handbook of Travel Behaviour* (pp. 256-278). Edward Elgar Publishing. https://doi.org/10.4337/9781839105746.00022

Lianto, F., Marizar, E. S., William, & Budiyanto, F. (2021). Wheelchair-accessible toilet at Gambir station. *Proceedings of the International Conference on Economics, Business, Social, and Humanities (ICEBSH 2021)*, *570*, 299-304.

MacDonald, D. (2024). *Exploring the accessibility knowledge of professional planners* [Master's thesis, Toronto Metropolitan University]. Toronto Metropolitan University Research Repository. https://rshare.library.torontomu.ca/articles/thesis/Exploring_the_Accessibility_Knowledge_of_Professional_Planners/25417426

Marín, J., Sáez-Pérez, M., Tajani, F., & Sica, F. (2023). Analysis of the accessibility improvement index in urban areas through heritage buildings used as museums—Case studies in the region of Murcia (Spain). *Sustainability*, *15*(18), Article 13517. https://doi.org/10.3390/su151813517

Mirza, M., Goyal, T., & Goyal, L. (2023). Barrier-free healthcare design for patients with disabilities. In D. Bhatia, P. K. Chaudhari, B. Chaudhary, S. Sharma, & K. Dhingra (Eds.), *A Guide to Hospital Administration and Planning* (pp. 251-266). Springer Nature Singapore. https://doi.org/10.1007/978-981-19-6692-7_14

Nakarmi, S., & Shrestha, S. (2022). Accessibility in public buildings for people with disability: A case of Patan, Nepal. *Proceedings of the 12th IOE Graduate Conference*, *12*, 244-252.

National Disability Authority. (2026). *Universal design*. Centre for Excellence in Universal Design. https://universaldesign.ie/about-universal-design

Olodeoku, M., Alokun, A., Alagbe, O., Egwabor, J., & Buseri, J. (2024). Exploring universal design principles in the built environment: An empirical review. *African Journal of Environmental Sciences and Renewable Energy*, *16*(1), 84-98. https://doi.org/10.62154/ajesre.2024.016.010352

Pakistan Engineering Council. (2006). Accessibility code of Pakistan. Pakistan Engineering Council.

Pakistan Engineering Council. (2021). *Building Code of Pakistan 2021 (Building Accessibility Provisions, Chapter 11).* Pakistan Engineering Council.

Story, M. F., Mueller, J. L., & Mace, R. L. (1998). *The universal design file: Designing for people of all ages and abilities*. NC State University, Centre for Universal Design.

Sindh Building Control Authority. (2002). *Karachi Building and Town Planning Regulations, 2002.* Sindh Building Control Authority

U.S. Access Board. (2015). *Guide to the ABA accessibility standards*. https://www.access-board.gov/aba/guides/chapter-4-ramps-and-curb-ramps/

U.S. Department of Justice. (2010). *2010 ADA standards for accessible design*. https://www.ada.gov/assets/pdfs/2010-design-standards.pdf

United Nations. (2015). *Transforming our world: The 2030 agenda for sustainable development.* https://sdgs.un.org/goals

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Exploring Malaysians' News Consumption Habit with Multimedia-Integrated News: A Reflexive Thematic Analysis Using Uses and Gratifications Theory

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ABSTRACT

Multimedia integration in online news has changed Malaysians' perceptions of news. This paper uses the uses and gratification theory (UGT) and reflexive thematic analysis (RTA) to explore how multimedia integration in news influences users' consumption habits. Through semi-structured interviews with ten informants, five key themes emerge: evolving news consumption habits, the role of multimedia and technology in engagement, cognitive and emotional responses, interactive and social experiences, and challenges in multimedia news integration. Findings indicate that multimedia-integrated news enhances engagement by improving comprehension, fostering emotional connections, and encouraging participation in the news. However, concerns arise over sensationalism, which may lead to people's negative perception of the news. Social media's dominance as a news source further amplifies these issues, as comment sections and content generalisation alter public discourse. At the same time, multimedia enhances storytelling. Informants expressed concerns about declining news quality, clickbait strategies, and credibility issues. Prior research has primarily examined ethnolinguistic differences in news content and framing, while evidence of audiences' actual cross-language news consumption remains limited. This study contributes to the literature by demonstrating how multimedia integration enables audiences to access news across language boundaries, suggesting that news consumption is not necessarily confined by linguistic differences. Future research could explore how news organisations and government policies can work together to address language-related barriers in news access, while promoting accurate cross-lingual reporting and minimising the risk of multimedia tools misleading audiences.

Keywords: Audience engagement, digital journalism, Malaysia, multimedia news, online news consumption, uses and gratifications theory

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INTRODUCTION

In today's rapid information era, the news industry is actively developing new strategies to remain relevant. The transformation of traditional media into digital platforms has encouraged audiences to consume news (Anderson et al., 2016). With the emergence of news portals, social media, and mobile applications, integrated reporting that uses multimedia elements has become an essential strategy for engaging audiences (Li, 2022). Multimedia integration is not merely about combining different media formats such as images, videos, and interactive graphics; it represents a fundamental change in news consumption habits, affecting how audiences process and share information (Geers, 2020).

As media keeps pace with technological progress, news consumption has evolved beyond passive reading or watching (De Corniere & Sarvary, 2022). Today's audiences actively engage with news through digital platforms, use social media for discussion, share news, and respond to real-time updates (Möller et al., 2019). This shift is particularly relevant in Malaysia, where internet penetration and smartphone use have contributed to the growing dominance of digital news consumption (MCMC, 2023). In addition, studies have shown that Malaysian audiences increasingly rely on online news portals and social media platforms for timely updates, entertainment, and social involvement, leading to a more dynamic and participatory culture (Omar et al., 2023).

Multimedia integration in news has been widely studied in Western contexts, especially in relation to technological innovation and mechanisms for public involvement (Avilés & Carvajal, 2008). However, this body of research is skewed towards individualistic cultures (Van Aelst et al., 2021). There has been limited research in areas such as Malaysia, where collective values and multilingual media ecosystems shape distinct consumption patterns. This difference constrains practical strategies for using multimedia elements to connect the public with culturally fragmented markets. By drawing on thematic analysis, this study addresses an evidence gap in how multimedia is communicated within Malaysia's social and technical context and helps to redress a regional imbalance in digital journalism research.

Given these changes, it is important to determine how multimedia affects audiences on online news portals. Uses and gratifications theory (UGT) is a valuable framework for explaining why individuals use news and multimedia elements to meet their needs and achieve satisfaction (Katz et al., 1973). Applying UGT, this study aims to understand the habit of consuming multimedia-based news in the Malaysian context.

In addition, while UGT has been widely used to investigate motivations for media consumption, fewer studies have applied it to news portals that integrate multimedia elements. This study seeks to address these gaps in understanding the multimedia properties that affect public involvement in

the Malaysian news context and to provide insights that can inform future digital journalism strategies.

This study aims to:

1. Examine how multimedia integration in Malaysian online news portals influences audience engagement.
2. Identify the key needs of Malaysian audiences when consuming multimedia news content using the UGT framework.
3. Explore audience perceptions and experiences related to multimedia elements in online news consumption through reflexive thematic analysis (RTA).

This study is significant because it contributes to a broader understanding of digital journalism in Malaysia and informs media organisations of effective strategies to increase public participation. This research bridges technological advances and public needs by examining multimedia integration through the UGT lens, providing practical implications for news organisations, journalists, and content creators.

LITERATURE REVIEW

Uses and Gratifications Theory (UGT) in News Consumption

UGT provides an important framework for understanding news consumption behaviour based on audience initiative. Unlike traditional media theory, UGT posits that news users do not receive information passively but actively choose media according to specific requirements to satisfy their needs (Katz et al., 1973). At its core, UGT seeks to reveal the motivations behind news usage patterns: individuals meet multidimensional needs, such as cognitive, social interaction and affective needs, through news consumption, and they choose relevant platforms according to media characteristics (Ruggiero, 2000). For example, during the COVID-19 pandemic, audiences active search for health news reflects informational needs driven by cognitive motives, whereas sharing content on social media reflects the social need to participate in public discussion (Ahmed & Zia, 2022).

Regarding needs classification, UGT research reveals complex needs in news consumption. Cognitive needs involve collecting information and building knowledge, such as understanding political effects through in-depth reports. Social needs are reflected in establishing social connections and maintaining group identity through sharing news. Affective needs include relieving stress through entertainment or fostering hope and motivation through positive reports (McQuail, 1987). In the digital media environment, news usage patterns show new characteristics (O'Riordan et al., 2023). The news push feed system aligns with users' interests based on individual usage patterns, improving the efficiency of information collection and exposing users to homogeneous material, thereby satisfying their needs. This contradiction highlights the complexity of need reception during technological change.

The development of media forms and technology has further shaped news consumption patterns (Van Aelst et al., 2021). Traditional media meet the need for systematic information through ritual viewing, whereas social media enables users to engage in real-time monitoring and co-creation of news. However, this shift has also fuelled controversy. Information overload can weaken deeper understanding, and the tendency towards news-as-entertainment can reduce the seriousness of public information (Meel & Vishwakarma, 2020). In addition, the instrumental functions of mobile news consumption show that news is not only about information sharing but is also embedded in daily practice (Wheatley & Ferrer-Conill, 2020).

Although UGT provides a flexible framework for explaining news consumption, its theoretical boundaries still require rigorous scrutiny. On the one hand, the theory overemphasises individual rationality and can overlook structural obstacles (Wei et al., 2024). The ambiguity in the classification of needs also raises questions about the validity of the measures it inspires. In this connection, some researchers have advocated combining UGT with additional forms of analysis, such as distinguishing between commuting reading and deep reading behaviours (Han et al., 2023). However, this study aims to examine the relationship between news algorithm stress and user independence and to uncover the cultural production of Malaysian news through multimedia integration using RTA.

Multimedia Integration in News

Multimedia integration has reshaped audiences, especially in terms of the cognitive and emotional needs associated with news consumption by combining media forms such as text, images, videos, and interactive graphics (Omar et al., 2024). Studies have shown that users' preference for multimedia news is not only due to technical innovation but also because it can fully meet multiple needs. At the level of cognitive requirements, multimodal information presentation can significantly improve the efficiency of understanding. For example, dynamic data visualisation translates complex financial trends into infographics, helping users quickly grasp core information (Freixa et al., 2021). Video reduces the cognitive burden on the audience to treat abstract concepts through the complementary combination of "picture + explanation" (Swart, 2021). In addition, scrolling through an interactive timeline to see the development of events and to locate information further strengthens the depth of knowledge building (Raza & Ding, 2022).

At the level of emotional needs, multimedia elements evoke strong resonance through sensory stimulation (Choi et al., 2020). For example, on-site audio and interview videos embedded in disaster or war reports can stimulate the audience's empathy, prompting the public to pay attention to social issues and participate in aid efforts. Immersive news enhances emotional engagement through a first-person

experience, making it easier for users to connect emotionally with news events (Wu et al., 2021). At the same time, lightweight multimedia content such as infographics and short video news suits fragmented reading habits, providing entertainment while satisfying the need for instant information acquisition (Owilla et al., 2023).

However, multimedia integration can also distort arguments about satisfying demand. On the one hand, increased dependence on visual elements may introduce cognitive bias. Users become aware of shocking images first and ignore textual details, which reduces overall comprehension efficiency when using information technologies (Lee & Hamilton, 2022). On the other hand, the misuse of emotional material can lead to ethical disputes: sensational soundtracks or selective editing can manipulate public sentiments and undermine the fairness of news (Cheng et al., 2021). More seriously, Deepfake technology blurs the boundary between reality and imagination, and users may inadvertently receive false information in emotional specialisation (Lee & Shin, 2021). These contradictions highlight the double-edged nature of multimedia news. Thus, expanding the ways of meeting users' needs also demands high levels of digital media literacy. This research further examines how to adapt to multimedia news, for example balancing emotional appeal and information overload or designing inclusive, interactive interfaces to reduce cognitive load for different groups. In addition, variations in users' multimedia needs must still be supported by empirical cross-group evidence.

News Consumption Habits in Malaysia

Malaysia's consumption reflects the tension between its multi-ethnic social structure and a wave of digitalisation (Tapsell, 2022). As a multilingual and multi-religious country, the media options available to the Malaysian displays significant ethnic discrimination: mainstream Malaysian outlets such as Utusan Malaysia and Astro Awani primarily serve the Malay majority, while Chinese-language newspapers such as Sin Chew Daily and China Press have become important information channels for Chinese readers (Mohamad Jamil, 2020). This discrimination stems from language preferences and is linked to ethnopolitical narratives, in which ethnic minorities access news with strong cultural affinity through their own language media to resist marginalisation in public discourse (Abdullah & Jamil, 2024). At the same time, religious values shape news consumption practices: Muslim groups prioritise coverage of Islamic issues and prefer content that adheres to religious morals (Saleh et al., 2021). The Chinese community is more sensitive to China-Malaysia news (Yu, 2023).

The popularity of digital technology is transforming Malaysia's traditional news landscape. In 2023, data indicated that Malaysia's internet penetration rate reached 89%, and social media users accounted for 86% of the total population (MCMC, 2023). The younger generation in particular

depends on Facebook, WhatsApp, and TikTok for instant news. Although this shift has intensified the information crisis and social platforms have broadened the reach of news, the spread of fake news has been exacerbated by public trust in online information generally being lower than in traditional media. To manage these risks, Malaysian users have developed a defensive media use strategy and cross-checking social media content with mainstream media outlets to confirm authenticity (Schuldt, 2021). In addition, there are significant differences between urban and rural areas. Urban inhabitants prefer to access news immediately via mobile devices, while rural communities still rely on television and word of mouth (Rami et al., 2021).

Political rules give clearer shape to the news ecology in Malaysia (Rajandran & Lee, 2023). The Anti-Fake News Act 2018 and the current Communications and Multimedia Act strictly control online content and have particularly cultivated public self-censorship around sensitive subjects (George, 2020). Moreover, studies have found that such guidelines have given rise to double information sites. The public avoids controversial news on open platforms and instead engages in niche discussions through encrypted communication applications such as Telegram, including the "Hidden News Contortion Subculture" (Radue, 2022). This partitioned state highlights the complexity of news consumption in Malaysia, which is under pressure from both technical authority and political obstacles. Consequently, the public continuously adjusts their information-gathering strategies to balance needs and risks.

Ultimately, this research focuses on the impacts of multimedia tools on reduce or bridge information gaps between ethnic groups.

METHODOLOGY

Research Design

The study adopts a qualitative research approach using RTA to determine how it affects multimedia integration into Malaysian online news portals. RTA is suitable for identifying patterns and themes in audience experiences, providing an in-depth understanding of news consumption behaviour. By employing RTA within UGT, this study aims to provide comprehensive findings.

Data Collection Process

To achieve the research objectives, the data were collected through semi-structured interviews. These interviews involved Malaysian news consumers from different states, aged 18 and above, who are actively engaged with online news portals. Purposive sampling was used to ensure diversity in demographics and preferences for news consumption. The interviews included open-ended questions designed to explore connections with the participants' experiences, motivations, and multimedia news integration, enabling them to share their perspectives independently (Siedlecki, 2022).

Before data collection, pre-testing semi-structured interviews were conducted using a cognitive interview method with two informants. Cognitive interviewing as a pre-testing method helps evaluate draft interview questions by exploring the respondent's mindset (Bhalla et al., 2023). This method was applied based on Tourangeau's (1984) four-stage cognitive model: comprehension, retrieval, judgement, and response. It refined the questions to enhance their clarity and relevance. The final semi-structured interview questions are:

1. Can you describe your daily or weekly news consumption habits? How do you usually access news?
2. How do different multimedia elements influence your interest in reading or watching the news? Do you use different multimedia tools for news?
3. Do you think multimedia elements help you understand the news better? Can you share an example of a news story where multimedia enhanced or reduced your comprehension?
4. How often do you share news articles or engage in discussions online? Do multimedia features encourage you to interact more with news content?
5. What challenges do you face when engaging with multimedia news content? How do you think Malaysian news portals can improve their multimedia integration?

Ethical guidelines were strictly followed to protect the informant's rights and data. Informed consent was obtained before the interviews, and participants were assured that their responses would remain anonymous. Consequently, all data collected have been securely stored, and only the researcher has access to this information. This study follows the rules of the institutional research board to maintain integrity and moral compliance throughout the research process.

A total of 10 informants were interviewed, as data saturation was reached, meaning no new insights or themes emerged from additional interviews. This outcome confirms that the collected data is sufficient for analysis and provides a comprehensive understanding of the research topic. Table 1 presents the informants:

Data Analysis

RTA is a qualitative research method that involves significant reflection on the researcher's role and impact on data interpretation (Braun & Clarke, 2019). Accordingly, the data collected in this study were analysed using RTA. The data analysis process followed Braun and Clarke's (2006) six phases of coding, conducted using ATLAS.ti.

First, the researcher familiarised himself with the data by reviewing the audio transcript to identify the initial pattern. The initial coding highlighted the recurrent theme, followed by the same codes and emerging subjects. The identified subjects and codes were then reviewed and refined to ensure consistency and accuracy.

Table 1
Informant's profile

Informant	Gender	States	Races	Occupation
Informant 1	Female	Johor	Chinese	Educator
Informant 2	Male	Penang	Chinese	Content-creator
Informant 3	Male	Sarawak	Bumiputera/i	Master students
Informant 4	Female	Sabah	Bumiputera/i	Educator
Informant 5	Male	Kedah	Malay	Waiter
Informant 6	Male	Perak	India	Lecturer
Informant 7	Female	Kelantan	Malay	Degree students
Informant 8	Male	Melaka	Chinese	Engineer
Informant 9	Male	Labuan	Chinese	Salesperson
Informant 10	Female	Selangor	India	Degree students

Source: Authors' work

Once this process was completed, the themes were defined and named to clarify the most important findings, which would be reported and interpreted in relation to the study's research objectives.

ATLAS.ti is qualitative analysis software that can identify complex thematic connections and analytical paths more effectively through in vivo coding and network-visualisation functions, which improves the depth and theoretical saturation of coding. It enables multimodal analysis in which coding tools can systematically integrate mixed data. Researchers can also reduce bias, thereby increasing research validity.

RESULTS

The findings are divided into five key themes in Table 2.

Table 2
Key themes of the present study

Themes	Description
Evolving News Consumption Habits	Suggests how participants have moved from traditional to multimedia-integrated news portals, their favourite platforms, and their consumption habits.
Role of Multimedia and Technology in Enhancing News Engagement	How do multimedia and technology elements affect audience interest, information retention, and overall engagement with online news?
Cognitive and Emotional Responses to Multimedia Content	It examines how multimedia improves understanding of news and affects the emotional responses to multimedia news.
Social and Interactive News Experiences	Analyses how multimedia promotes social interaction, encourages news sharing, and influences participation in discussions through comments, live chats, and social media integration.
Challenges and Expectations for Multimedia News Integration	Identifies obstacles to future expectations of multimedia news, user preferences for improvement, and more effective multimedia integration in Malaysian news portals.

Source: Authors' work

Evolving News Consumption Habits

With the development of the internet and new technologies, traditional media such as newspapers and television are no longer people's preferred information channels in Malaysia. As the informant stated, today's news consumption behaviour is being influenced and reshaped by different media, and people are increasingly relying on social media to obtain news.

> In the past, our family would sit in front of the TV to watch the news. Now, our family is holding their phones, watching TikTok, sharing it with friends on WhatsApp, forward to a lot of friends and then discussing it with them (Informant 5).

> During my childhood, we read text-based news only. Now we can see videos because most of the news content is now multimedia; they post videos with captions or perhaps with a hyperlink (Informant 3).

Another informant noted that short video platforms have changed how news is disseminated. Short video news has developed rapidly in Malaysia and has become an important channel for news dissemination.

> I don't have any friend that actually reads the news; I think most people use short videos or TikTok to watch the news now because it's engaging, or even watch it on different social media platforms like Facebook or IG (Informant 8).

The informant also pointed out that social media algorithms and AI personalise the news users like and are interested in, while filtering out only the information they want in today's news.

> What I like is the news algorithm for this news portal; if we have searched for news related to Football only. For me, one of its benefits is that what we want to find will be more about Football (Informant 9).

> Now I don't have to read the news manually every day. I can just open the news app such as "Lumi" or social media and AI, and my push feed will summarize and filter out the news I want to read today (Informant 2).

> All of the platforms have news: WhatsApp, Facebook, Twitter, Telegram. We don't intend to watch it; the news will come to us (Informant 7).

Role of Multimedia and Technology in Enhancing News Engagement

Most informants believed multimedia helps them engage with the news. When discussing news engagement, many informants highlighted online news portals that integrate the multimedia elements of social media platforms as the primary reason.

> Nowadays, social media make it easier for you to share, and they know that people want to share. On some online news portals, it's very easy to click twitter, Facebook button, automatically share (Informant 6).

> There are a lot of people who comment below the news; I also will read their comments, so I will communicate with them and make things interesting (Informant 1).

The informant stated that users can engage with news through various technologies and media, including text, pictures, videos, and other multimedia. Consequently, a culture of user engagement has gradually formed.

> It's quite easy for us; we can engage with news content like commenting, liking, and sharing. These features let people freely express their opinions, react to the news, and interact with others (Informant 7).

> For me, I use my social media accounts to share my own content or provide in-depth commentary on news stories. Creating content allows me to express my personal perspective and share my professional knowledge. Plus, it can help add more depth and support to the news itself… (Informant 8).

Cognitive and Emotional Responses to Multimedia Content

Multimedia has made significant progress in news dissemination, and it is believed that multimedia can help people understand some news more easily.

> It helps me easily gain my knowledge. I am doing my FYP; it helps me easily know what people are sharing and how people are thinking, what people's perspectives are on this issue. It really helps me to gain knowledge through these platforms… (Informant 10).

> Multimedia that I prefer is the comments because not everything in the news text is conveyed in depth; even though sometimes the comments give information that is wrong, we also require views from everyone to know the information in the news that the news wants to convey and understand the news (Informant 4).

Traditional news emphasises professionalism, which rarely includes emotional responses to our society. In multimedia news content, emotional factors can be highly involved, as the informant stated:

> TV news does not talk about topics that we care about, and we can't share, but now the news will report all the things in internet, which is closer to our lives; the news is what people care about (Informant 9).

> I find it interesting that news media now report on many things, such as viral content, or maybe people response of the content, the emotional in the comment section between users, and interviewing some citizens, which I can feel in the news (Informant 6).

> With the development of cameras, now the incidents we see in online content are so "real", especially through video and live (Informant 2).

Social and Interactive News Experiences

In Malaysia, multimedia is enhancing news experiences across multiple races. The informant also mentioned that with multimedia capabilities, they are now accessing news in different languages and discussing it with other races.

> Sometimes, I can understand Chinese news by translating the Chinese captions or comments, and at the same time, I can learn Chinese and discuss it with my Chinese friend (Informant 7).

> … some Malay or Chinese online news portals share content from Indian online news portals such as Astro Vanakkam (Informant 10).

Now, with the ease of internet access, news portals from different regions or even states can set up their own websites, allowing people to engage more with places that give them a sense of belonging.

> We have news portals like Oh! My Sabah, and it shares things happened in Sabah, and although I am working outside, I can keep interacting with my hometown friends (Informant 4).

> In Johor, we have Chinese online news portals like "Big Johor", which is very good for me to have more connections with my hometown (Informant 1).

Challenges and Expectations for Multimedia News Integration

Informants also raised concerns about the challenges of navigating multimedia news. While acknowledging the benefits of Multimedia news integration, they cautioned against sensationalism and questioned its credibility among audiences.

> Most of the multimedia news headlines and infographics are just to attract audiences; the content and the headlines are completely different (Informant 8).

> With the information overload in multimedia content, we will keep facing challenges from false and misleading information and fake news (Informant 10).

> The content of the news comes first; if we want people to see what we are saying, we need to give something that is sensitive, something that is interesting, so interesting news highlights will attract people's interest. So, the problem now is that if we only

> read the highlights, we don't know from the beginning to the end; that will make us predict that incident… (Informant 3).

There has been a shift in current news production. The generalisation of news and the diversification of content have caused many informants to lose confidence in the news.

> Especially on the content side, maybe balance in reporting, don't like 70 percent on entertainment (Informant 10).

> I am quite disappointed in Malaysian news, especially on the quality of the content; maybe I watch some news on Facebook; the news content comes out with different things on another platform. Usually, I have to check again on mainstream media and Google it to check the news (Informant 2).

> You know that? Multimedia news, they want the exposure; they will keep focusing on highlights and focus on 3R, you know, right? And politician saying (Informant 1).

Given Malaysia's diverse linguistic landscape, informants recommended expanding multilingual content.

> I hope that Malaysia government can pay attention to our racial harmony news, such as combining all of them into one platform… maybe? And terms and conditions to publish some news, because they should know that every word they use may affect society (Informant 9).

> We hope the future of Malaysian news can pay attention to other races' news, and we can understand each other easily. Adding more language tools will help, not just like Chinese pay attention to Chinese News… (Informant 5).

DISCUSSION

This study reveals the complex dynamics of Malaysian audiences' participation in multimedia news by examining the interactive relationship between UGT and the algorithmic news ecology. The study found that the active audience emphasised by traditional UGT theory presents a duality within algorithmic recommendation systems. Users may efficiently satisfy their cognitive needs through personalised push feeds, reflecting technological empowerment (Han et al., 2023). Conversely, the narrowing of information caused by algorithmic filtering weakens exposure to critical news and creates passive audiences. This challenges the assumption of pure initiative and echoes Lee and Tandoc Jr.'s (2023) research on platformed agency, which emphasises that algorithmic structures and individual strategies jointly shape user behaviour. For example, respondents mitigated information bias through cross-platform verification, reflecting the reconstruction

of audience agency in a technologically mediated environment.

Multimedia integration as a cognitive tool is particularly prominent in the Malaysian context. Dynamic visualisation enhances understanding efficiency through multimedia integration, confirming cognitive needs (Omar et al., 2024). Emotional narratives can enhance social empathy but may be appropriated by commercial logic and turned into a sensational trap. This finding thus enters into dialogue with the notion of emotional hijacking in ethnic-political news framing. It highlights the specificity of Malaysia in the wake of the Anti-Fake News Law and persistent ethnic politics (Mohamad Jamil, 2020). The media further amplifies sensational content in competition for fragmented attention, leading to a structural imbalance in the quality of public information.

Beyond this, the study reveals the challenge of applying Western theoretical frameworks to Malaysia's news ecology. First, language-driven information stratification is pronounced (Tapsell, 2022). Ethnic minority users actively use translation tools to access cross-language content, transforming the social integration function of UGT into cross-ethnic negotiation practices and challenging McQuail's (1987) single cultural identity model. Second, hyperlocal platforms strengthen emotional connections through regional identity, indicating that multimedia news can simultaneously meet globalisation and localisation needs. However, the cultural blindness of algorithmic recommendations has exacerbated ethnic information gaps, in sharp contrast to multilingual studies dominated by English. This finding calls for UGT to incorporate a critical cultural-technological perspective to explain the co-construction of technology and culture in non-Western contexts.

The dimension of citizen participation presents a contradictory picture: although multimedia promotes instant interaction, the fast-food consumption of short news videos has spawned shallow participation, confirming Schuldt's (2021) criticism of platform sociality. More critically, discussions on sensitive issues have shifted to encrypted platforms, forming a shadow public sphere and exposing the repressive effects of authoritarian regulation on digital democracy. This phenomenon suggests that participation in Malaysia is not merely a technical choice but a sensitive matter of risk calculation (George, 2022)

CONCLUSION

This study has achieved three theoretical breakthroughs in digital news research. First, by constructing the UGT framework, it integrates news algorithms, ethnic satisfaction, and cultural aspects, systematically challenging the universalist paradigm in media psychology research. This framework reveals how individual news consumption behaviour is reshaped by news algorithms and highlights cultural negotiation practices in Malaysia's multi-ethnic society. For example, the translation and use of cross-language comments provide a new analytical dimension

for understanding non-Western digital ecologies. Secondly, at the methodological level, the study closely captures the micro-dynamics of technology-society interaction through RTA, such as users' strategic resistance to algorithmic recommendations or the political calculations behind platform encryption behaviour. This qualitative orientation compensates for the neglect of contextual complexity in traditional quantitative UGT research, especially in revealing implicit power relations such as the impact of algorithmic exclusion on ethnic minorities. Finally, by dissecting institutional constraints in Malaysia's authoritarian context, the study reveals the dialectical relationship between technological empowerment and political repression in multimedia news practice. This opens a new problem domain for digital research in the Global South: how technology diffusion and local governance structures are mutually constructed.

At a practical level, the study proposes a set of context-sensitive multimedia strategy systems to address the unique challenges of Malaysia's news ecology. To promote cognitive fairness, it is recommended that news organisations embed deep text analysis in visualisation tools such as interactive charts to avoid overly simplistic representations. In terms of cultural adaptation technology, it is necessary to move beyond existing mechanical language conversion systems and develop AI-based tools for cultural semantic mapping. For example, such tools could automatically identify and convert localised expressions of religious terms in Chinese translations of Malay news. In addition, reform for algorithmic transparency should allow users to customise content filtering rules, breaking platforms' monopolistic control of black-box recommendations, alleviating algorithmic bias and enhancing audiences' media literacy.

However, this study still has certain limitations. Due to the urban-rural and ethnic composition of the sample, the news practices of Indigenous groups in rural areas have not been fully captured, and their multimedia usage patterns may reveal entirely different news engagement habits. Future research can deepen this exploration through mixed methods and longitudinally track how the abolition of the Anti-Fake News Law affects the multimedia integration strategies of news organisations. At the same time, participatory news algorithms empower marginalised groups to co-govern recommendation systems. These directions will help refine the theoretical model and provide empirical support for the digital rights movement in Southeast Asia.

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REFERENCES

Abdullah, N. A., & Jamil, S. N. A. (2024). Embracing diversity: Indigenous content and cultural identity in Malaysian media. *Hollex Journal of Marketing and Mass Communication*, *12*(1), 1-10.

Ahmed, S. I., & Zia, A. (2022). Uses and gratification theory and social media interactivity: A demographic study in Lahore, Pakistan. *Global Regional Review*, *7*(1), 50-60. https://doi.org/10.31703/grr.2022(vii-i).06

Anderson, C. W., Downie, L., & Schudson, M. (2016). *The news media: What everyone needs to know*. Oxford University Press.

Avilés, J. A. G., & Carvajal, M. (2008). Integrated and cross-media newsroom convergence: Two models of multimedia news production - The cases of Novotecnica and La Verdad Multimedia in Spain. *Convergence*, *14*(2), 221-239. https://doi.org/10.1177/1354856507087945

Bhalla, S., Bahar, N., & Kanapathy, K. (2023). Pre-testing semi-structured interview questions using expert review and cognitive interview methods. *International Journal of Business and Management*, *7*(5), 11-19. https://doi.org/10.26666/rmp.ijbm.2023.5.2

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77-101. https://doi.org/10.1191/1478088706qp063oa

Cheng, L., Guo, R., Shu, K., & Liu, H. (2021). Causal understanding of fake news dissemination on social media. In *Proceedings of the 27th ACM SIGKDD Conference on Knowledge Discovery & Data Mining (KDD '21)* (pp. 148-157). Association for Computing Machinery. https://doi.org/10.1145/3447548.3467321

Choi, J., Lee, S. Y., & Ji, S. W. (2020). Engagement in emotional news on social media: Intensity and type of emotions. *Journalism & Mass Communication Quarterly*, *98*(4), 1017-1040. https://doi.org/10.1177/1077699020959718

De Corniere, A., & Sarvary, M. (2022). Social media and news: Content bundling and news quality. *Management Science*, *69*(1), 162-178. https://doi.org/10.1287/mnsc.2022.4341

Freixa, P., Pérez-Montoro, M., & Codina, L. (2021). The binomial of interaction and visualization in digital news media: Consolidation, standardization and future challenges. *El Profesional de la Información*, *30*(4). https://doi.org/10.3145/epi.2021.jul.01

Geers, S. (2020). News consumption across media platforms and content: A typology of young news users. *Public Opinion Quarterly*, *84*(S1), 332-354. https://doi.org/10.1093/poq/nfaa010

George, C. (2020). Media control and censorship in Malaysia: The impact of the Anti-Fake News Act 2018. *Asian Journal of Communication*, *30*(4), 321-337.

George, C. (2022). *Media and power in Southeast Asia: Authoritarian resilience and democratic resistance*. Cambridge University Press.

Han, Y., Mahamed, M. B., Abdullah, Z., & Wan Abas, W. A. (2023). Integrating TAM and UGT to explore motivations of using social media for news reading among Chinese college students. *International Journal of Academic Research in Business and Social Sciences*, *13*(6), 2374-2389. https://doi.org/10.6007/ijarbss/v13-i6/17330

Katz, E., Blumler, J. G., & Gurevitch, M. (1973). Uses and gratifications research. *Public Opinion Quarterly*, *37*(4), 509-523. https://doi.org/10.1086/268109

Lee, J., & Hamilton, J. T. (2022). Anchoring in the past, tweeting from the present: Cognitive bias in journalists' word choices. *PLOS ONE, 17(3)*, Article e0263730. https://doi.org/10.1371/journal.pone.0263730

Lee, J., & Shin, S. Y. (2021). Something that they never said: Multimodal disinformation and source vividness in understanding the power of AI-enabled deepfake news. *Media Psychology*, *25*(4), 531-546. https://doi.org/10.1080/15213269.2021.2007489

Lee, J. Y., & Tandoc, E. C., Jr. (2023). Platformed agency: How audiences resist algorithmic news curation. *New Media & Society*, *25*(1), 45-62.

Li, X. (2022). On the news integration skills in the new media era. *Journal of Higher Education Research*, *3*(1), 14-16. https://doi.org/10.32629/jher.v3i1.629

Malaysian Communications and Multimedia Commission (MCMC). (2023). *Internet and social media usage statistics in Malaysia 2023*. https://www.mcmc.gov.my/

McQuail, D. (1987). *Mass communication theory: An introduction*. Sage Publications.

Meel, P., & Vishwakarma, D. K. (2020). Fake news, rumor, information pollution in social media and web: A contemporary survey of state-of-the-arts, challenges and opportunities. *Expert Systems with Applications, 153*, Article 112986. https://doi.org/10.1016/j.eswa.2019.112986

Mohamad Jamil, S. N. (2020). 'Malaysia belongs to the Malays' (Malaysia ni Melayu Punya!): Categorising 'us' and 'them' in Malaysia's mainstream Malay-language newspapers. *Critical Discourse Studies, 18*(6), 671-687. https://doi.org/10.1080/17405904.2020.1834419

Möller, J., Van De Velde, R. N., Merten, L., & Puschmann, C. (2019). Explaining online news engagement based on browsing behavior: Creatures of habit? *Social Science Computer Review, 38*(5), 616-632. https://doi.org/10.1177/0894439319828012

Omar, B., Al-Samarraie, H., Alzahrani, A. I., & Kee, N. S. (2024). Unlocking young people's engagement with online news: Affective or cognitive? *Online Information Review, 48*(5), 944-958. https://doi.org/10.1108/OIR-12-2022-0691

Omar, B., Ng, S. K., & Ismail, N. (2023). Effects of message, medium, and motivational factors on news engagement and mobile news consumption: Evidence from Malaysia. *Online Journal of Communication and Media Technologies, 13*(3), Article e202325. https://doi.org/10.30935/ojcmt/13116

O'Riordan, S., Emerson, B., Feller, J., & Kiely, G. (2023). The road to open news: A theory of social signaling in an open news production community. *Journal of Management Information Systems, 40*(1), 130-162.

Owilla, H., Mogere, C., & Booker, N. A. (2023). *Media consumption in an evolving digital world: Millennials and digital natives' consumption habits and implications for legacy media in Kenya* [The Media Futures EA Project]. Aga Khan University.

Radue, M. (2022). Comparing impacts on media freedom in Southeast Asia: Connotative context factors in Malaysia, Myanmar and Thailand. *Global Media and Communication, 18*(2), 157-179. https://doi.org/10.1177/17427665221097852

Rajandran, K., & Lee, C. (2023). Politics in Malaysia: A discourse perspective. In K. Rajandran & C. Lee (Eds.), *Discursive approaches to politics in Malaysia: Legitimising governance* (pp. 1-15). Springer Nature. https://doi.org/10.1007/978-981-19-5334-7_1

Rami, A. M., Aziz, F., Zaremohzzabieh, Z., & Ibrahim, A. (2021). Assessing the challenges of local leaders in rural community development: A qualitative study in Malaysia. *Pertanika Journal of Social Sciences & Humanities, 29*(S1), 1-18. https://doi.org/10.47836/pjssh.29.s1.01

Raza, S., & Ding, C. (2022). News recommender system: A review of recent progress, challenges, and opportunities. *Artificial Intelligence Review, 55*(1), 749-800. https://doi.org/10.1007/s10462-021-10043-x

Ruggiero, T. E. (2000). Uses and gratifications theory in the 21st century. *Mass Communication & Society, 3*(1), 3-37. https://doi.org/10.1207/s15327825mcs0301_02

Saleh, M. S. M., Kasuma, S. A. A., Zuknik, M. H., & Hasan, N. N. N. (2021). Islamic values in environmental communication within the Malaysian media: A case study of Utusan Malaysia and Berita Harian. *Jurnal Komunikasi: Malaysian Journal of Communication, 37*(3), 54-72. https://doi.org/10.17576/jkmjc-2021-3703-04

Schuldt, L. (2021). Official truths in a war on fake news: Governmental fact-checking in Malaysia, Singapore, and Thailand. *Journal of Current Southeast Asian Affairs, 40*(2), 340-371. https://doi.org/10.1177/18681034211008908

Siedlecki, S. L. (2022). Conducting interviews for qualitative research studies. *Clinical Nurse Specialist, 36*(2), 78-80.

Swart, J. (2021). Tactics of news literacy: How young people access, evaluate, and engage with news on social media. *New Media & Society, 25*(3), 505-521. https://doi.org/10.1177/14614448211011447

Tapsell, R. (2022). New media, old rule in Malaysia. In G. Lopez & B. Welsh (Eds.), *Regime resilience in Malaysia and Singapore* (pp. 129-143). World Scientific. https://doi.org/10.1142/9789811268663_0009

Tourangeau, R. (1984). Cognitive sciences and survey methods. In T. B. Jabine, M. L. Straf, J. M. Tanur, & R. Tourangeau (Eds.), *Cognitive aspects of survey methodology: Building a bridge between disciplines* (pp. 73-100). National Academic Press.

Van Aelst, P., Toth, F., Castro, L., Štětka, V., De Vreese, C., Aalberg, T., Cardenal, A. S., Corbu, N., Esser, F., Hopmann, D. N., Koc-Michalska, K., Matthes, J., Schemer, C., Sheafer, T., Splendore, S., Stanyer, J., Stępińska, A., Strömbäck, J., & Theocharis, Y. (2021). Does a crisis change news habits? A comparative study of the effects of COVID-19 on news media use in 17 European countries. *Digital Journalism, 9*(9), 1208-1238. https://doi.org/10.1080/21670811.2021.1943481

Wei, D., Chan, L.-S., Du, N., Hu, X., & Huang, Y.-T. (2024). Gratification and its associations with problematic internet use: A systematic review and meta-analysis using use and gratification theory. *Addictive Behaviors, 155*, Article 108044. https://doi.org/10.1016/j.addbeh.2024.108044

Wheatley, D., & Ferrer-Conill, R. (2020). The temporal nature of mobile push notification alerts: A study of European news outlets' dissemination patterns. *Digital Journalism, 9*(6), 694-714. https://doi.org/10.1080/21670811.2020.1799425

Wu, H., Cai, T., Luo, D., Liu, Y., & Zhang, Z. (2021). Immersive virtual reality news: A study of user experience and media effects. *International Journal of Human-Computer Studies, 147*, Article 102576. https://doi.org/10.1016/j.ijhcs.2020.102576

Yu, Z. (2023). Research on the brand image of "study in China" in the new era of overseas Chinese newspapers and periodicals: A case study of Sin Chew Daily in Malaysia. *Amazonia Investiga, 12*(67), 327-336. https://doi.org/10.34069/ai/2023.67.07.29

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Rekonstruksi Konsonan Dialek Melayu Patani Narathiwat Purba

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ABSTRAK

Sehingga kini, masih belum terdapat kajian yang berusaha merekonstruksi bentuk purba dialek Melayu Patani. Sehubungan itu, kajian ini memfokuskan kepada rekonstruksi fonem konsonan dialek Melayu Patani Narathiwat Purba (DMPNP). Penelitian berbentuk kualitatif digarap untuk memenuhi keperluan objektif tersebut melibatkan enam (6) buah lokaliti di wilayah Narathiwat. Lokaliti yang diberikan tumpuan antaranya adalah seperti Kresor, Buketa, Puyok, Munok, Benae Luwas dan Aikubu. Pendekatan kualitatif yang diaplikasikan dalam kajian ini antaranya; kaedah kepustakaan dan kaedah lapangan. Maklumat dipilih berdasarkan kriteria NORM/F, yang termasuk individu berusia dan menetap di kawasan luar bandar. Proses pencuplikan data melibatkan teknik temu bual, pengajuan gambar, senarai daftar kata dan rakaman yang akan ditransliterasikan kepada simbol bunyi. Teori Rekonstruksi yang diaplikasikan dalam kajian ini untuk penganalisisan data telah berjaya mengekstrak 18 fonem konsonan iaitu enam fonem konsonan letupan (*p, *t, *k, *b, *d dan *ɡ); empat fonem konsonan sengauan (*m, *n, *ɲ dan *ŋ); tiga fonem konsonan geseran (*s, *h dan *ɣ); dua fonem konsonan letusan (*ʧ dan *ʤ); satu fonem konsonan sisian (*l) dan dua fonem konsonan separuh vokal (*w dan *j). Tiga perkara diberikan penekanan dalam bahagian perbincangan antaranya ialah penyerlahan ciri inovasi dan retensi DMPNP dengan bentuk Malayik Purba (MP) dan transisi ciri fonologi keluarga bahasa Tai-Kadai dalam varian DMPNP. Kajian lanjutan terhadap sistem vokal dan diftong DMPNP disarankan bagi memperincikan hubungan kekerabatan antara MP dan DMPNP, serta

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menyusun klasifikasi varian yang lebih sistematik. Setelah semua fonem direkonstruksi, analisis dapat diperluas ke tahap leksikal. Ini termasuk usaha untuk membina kamus leksikal purba untuk dialek ini.

Kata Kunci: Dialek Melayu Patani Narathiwat purba (DMPNP), fonem konsonan, inovasi, kekerabatan, kualitatif, Malayik Purba (MP), Narathiwat, perekonstruksian

Consonant Reconstruction of The Ancient Narathiwat Patani Malay Dialect

ABSTRACT

*To date, no study has attempted to reconstruct the proto-form of the Patani Malay dialect. Accordingly, this study focuses on the reconstruction of consonant phonemes in Proto-Narathiwat Patani Malay Dialect (DMPNP). A qualitative design was employed to fulfill this objective across six localities in the Narathiwat province: Kresor, Buketa, Puyok, Munok, Benae Luwas, and Aikubu. Qualitative methods included library research and fieldwork. Informants were selected based on NORM/F criteria, targeting older individuals residing in rural areas. Data collection utilized interviews, image elicitation, word lists, and audio recordings, which were subsequently transcribed into phonetic symbols. Applying Reconstruction Theory to the data analysis yielded 18 reconstructed consonant phonemes: six plosives (*p, *t, *k, *b, *d, and *g); four nasals (*m, *n, *ɲ, and *ŋ); three fricatives (*s, *h, and *ɣ); two affricates (*ʧ and *ʤ); one lateral (*l); and two semivowels (*w and *j). The discussion highlights three core areas: the innovation and retention features of DMPNP compared to Proto-Malayic (MP), and the transition of Tai-Kadai phonological features within the DMPNP variants. Further research on the vowel and diphthong systems of DMPNP is recommended to refine the genetic relationship between MP and DMPNP, as well as to establish a more systematic classification of its variants. Once all phonemes are reconstructed, the analysis can be expanded to the lexical level, including the compilation of a proto-lexical dictionary for this dialect.*

Keywords: *Consonant phonemes, genetic relationship, innovation, Narathiwat, Proto-Malayic (MP), Proto-Narathiwat Patani Malay Dialect (DMPNP), qualitative, reconstruction*

PENGENALAN

Patani, sekiranya menurut catatan para pelawat China yang berhubung dengan negeri-negeri di Asia Tenggara, telah dikenali pasti sebagai sebuah entiti politik yang dikenali sebagai Langkasuka atau Lang-ya-shiu (Paul Wheatley, 1961, seperti yang dinukilkan dalam Nik Anuar, 2006) sudah pun wujud pada abad kedua Masihi. Berdasarkan catatan tersebut, para ahli sejarah Eropah percaya bahawa lokasi asal negeri Patani terletak di pantai timur Semenanjung Tanah Melayu, iaitu di antara Senggora (atau wilayah Songkhla) dan

negeri Kelantan, manakala ibu kotanya terletak di kawasan wilayah Pattani, iaitu daerah Yarang (Nik Anuar, 2006).

Dalam konteks kajian ini, istilah "negeri" merujuk kepada unit pemerintahan atau wilayah politik Melayu pada masa lampau, manakala istilah "wilayah" dan "daerah" merujuk kepada unit pentadbiran Thailand pada masa kini. Istilah "negara" pula merujuk kepada entiti politik yang berdaulat, seperti Siam dan Thailand. Pada tahun 1816, Patani dibahagikan kepada tujuh negeri kecil dan dinamakan "Kawasan Tujuh Negeri Melayu" yang meliputi Rangek, Raman, Yala, Yaring, Saiburi, Nongchik, dan Pattani. Berdasarkan nama-nama negeri tersebut, sebahagiannya berstatus sebagai wilayah, manakala sebahagiannya lagi berstatus sebagai daerah di negara Thailand pada masa kini. Yala dan Pattani merupakan wilayah di selatan Thailand, manakala Saiburi, Yaring, dan Nongchik adalah daerah dalam wilayah Pattani. Begitu juga, Raman merupakan daerah dalam wilayah Yala, dan Rangek merupakan daerah dalam wilayah Narathiwat (Ruslan, 2011).

Pada tahun 1902, semasa pemerintahan Raja Chulalongkorn, Patani diserap sepenuhnya ke dalam pemerintahan Siam dan menjadi sebahagian daripada negara Siam (Nanthawan, 1978). Pada tahun 1906, kawasan tujuh negeri kecil itu dibahagikan semula kepada empat negeri, iaitu Pattani, Saiburi, Yala, dan Bangnara. Pada tahun 1915, nama negeri "Bangnara" ditukar kepada negeri "Narathiwat" (Worawit, 1990). Pada tahun 1906, kesemua negeri tersebut disusun dan digabungkan menjadi Monthon Patani (Nanthawan, 1978, seperti yang dinukilkan dalam Ruslan, 2011). Pada tahun 1916, sistem pentadbiran Siam berubah lagi daripada Monthon kepada Changwat (wilayah) (Worawit, 1990). Sejak tahun 1916, negeri Melayu yang dikenali sebagai Patani telah berubah statusnya menjadi wilayah Pattani yang terletak di bahagian selatan Thailand (Ruslan, 2011).

Terdapat dua istilah yang berkaitan dengan perkataan Patani dan Pattani. Kedua-dua istilah ini sering digunakan secara bersinonim, seperti dalam istilah dialek Melayu Patani dan dialek Melayu Pattani, yang merujuk kepada dialek Melayu yang digunakan di kawasan wilayah Pattani, Yala, Narathiwat dan sebahagian wilayah Songkhla (Ruslan, 2011). Namun demikian, kajian Paitoon (2005) menjelaskan bahawa istilah Patani merujuk kepada kawasan yang merangkumi kawasan penutur dialek tersebut, termasuk wilayah Pattani dan kawasan sekitarnya, iaitu wilayah Yala, Narathiwat, dan sebahagian wilayah Songkhla. Sebaliknya, istilah Pattani pula merujuk kepada kawasan yang populasinya hanya terdapat di wilayah Pattani sahaja.

Dialek Melayu Patani adalah dialek Melayu yang dituturkan di bahagian selatan Thailand. Penyebaran dialek ini meliputi wilayah Pattani, Yala, Narathiwat, serta sebahagian dari Songkhla, termasuk daerah Sebayoi, Thepa, Nathawi, dan Chana. Beberapa kajian mengenai dialek Melayu Patani telah dijalankan di selatan Thailand, antaranya kajian oleh (Abdonloh et al., 2022; Angsana & Ilangko, 2021; Ibrohim,

2016, 2023; Paitoon, 2005; Rahim et al., 2021; Ruslan, 2011; Sareeyah, 2016; Shahidi & Mumad, 2020; Suraiya, 2020; Zulkifley & Pareeda, 2015)

Berdasarkan kajian-kajian terdahulu, dapat disimpulkan bahawa kajian rekonstruksi dialek Melayu Patani Narathiwat masih belum dijalankan oleh pengkaji-pengkaji sebelumnya. Tetapi kajian fonologi, morfologi, dialektologi, pemetaan, akustik dan sosiolinguistik banyak terdapat dalam khazanah inventori dialek Melayu Patani.

Walau bagaimanapun, tidak dinafikan himpunan kajian lepas telah memberikan sumbangan besar serta turut memberikan gambaran awal kepada pengkaji untuk menghasilkan satu kajian baharu dan menghasilkan pendeskripsian yang lebih terperinci dan berpada. Sehubungan itu, kajian ini berusaha untuk merekonstruksi dialek Melayu Patani Narathiwat demi memperoleh bentuk dialek Melayu Patani Narathiwat Purba (DMPNP). Fokus utama kajian ini adalah untuk mengenal pasti bentuk fonem purba dialek Melayu Patani Narathiwat (DMPN) dengan menggunakan kaedah teori rekonstruksi.

Signifikasi Kajian

Kajian ini memberikan sumbangan penting dalam memahami proses perubahan bahasa Melayu Patani Narathiwat dari bentuk yang dikenali umum pada hari ini (baca: bentuk sinkronik) kepada bentuk proto melalui pendekatan linguistik bandingan dan sejarawi. Meskipun kajian fonologi terhadap dialek ini telah banyak dilakukan, analisis yang mengaitkan perubahan fonologi dengan ciri bahasa purba yang telah dibina semula masih kurang diterokai. Berdasarkan sorotan kajian lepas yang dijalankan, sehingga kini belum terdapat sebarang kajian yang secara khusus merekonstruksi bentuk purba Dialek Melayu Patani Narathiwat. Oleh itu, kajian ini merupakan kajian pertama yang berusaha merekonstruksi bentuk purba dialek tersebut melalui pendekatan linguistik bandingan dan sejarawi. Justeru, kajian ini berusaha mengisi jurang tersebut dengan membina semula fonem-fonem purba khususnya konsonan serta mengenal pasti inovasi dan retensi dalam dialek ini dengan ciri bahasa Malayik Purba (MP) yang telah dibina semula oleh Adelaar (1992).

Pendekatan linguistik bandingan membolehkan penyelidik menelusuri perubahan fonologi yang berlaku akibat interaksi bahasa dan budaya dalam sejarah masyarakat Patani. Dalam konteks ini, dasar kerajaan Thailand yang mewajibkan bahasa Thai dalam sistem pendidikan telah mempercepatkan proses asimilasi (Worawit, 1999), sekali gus memberi kesan kepada penggunaan dan kelangsungan dialek Melayu Patani. Oleh itu, kajian ini bukan sahaja membina semula ciri konsonan purba dialek ini, tetapi juga memberikan pemahaman yang lebih mendalam tentang kesan sejarah dan politik terhadap perubahan bahasa.

Hasil kajian ini dijangka menyumbang kepada pemeliharaan ciri linguistik masyarakat Melayu Patani serta memperkayakan bidang linguistik sejarah dengan maklumat yang lebih sistematik

mengenai evolusi fonem konsonan. Dengan menerapkan teori rekonstruksi, kajian ini dapat memberikan gambaran yang lebih jelas tentang dinamika fonologi dalam dialek Melayu Patani-Narathiwat, sekali gus menjadi rujukan penting dalam kajian bahasa serumpun.

SOROTAN LITERATUR

Terdapat beberapa kajian yang dijalankan di selatan Thailand mengenai dialek Melayu Patani antaranya kajian Abdonloh et al., 2022; Angsana dan Ilangko, 2021; Ibrohim, 2016, 2023; Paitoon, 2005; Rahim et al., 2021; Ruslan, 2011; Sareeyah, 2016; Shahidi dan Mumad, 2020; Suraiya, 2020; Zulkifley dan Pareeda, 2015. Berdasarkan sorotan kajian lepas, kajian berkaitan dialek Melayu Patani dapat dibahagikan kepada tiga tema utama, iaitu kajian fonologi dan morfologi, kajian dialektologi serta kajian linguistik lain.

Kajian Fonologi dan Morfologi

Kajian Paitoon (2005) membincangkan pembentukan semula sistem morfofonologi dalam dialek Melayu Patani. Secara keseluruhannya, kajian ini mendapati bahawa unsur suprafiks kepanjangan konsonan dalam Dialek Melayu Patani mempunyai persamaan dengan fonem nada menurun tak datar dalam bahasa Thai. Persamaan tersebut menunjukkan bahawa fenomena ini boleh dianggap sebagai satu bentuk transmorfofonologisasi suprafiks. Hal ini kerana unsur kepanjangan konsonan dalam dialek Melayu Patani mempunyai ciri akustik yang serupa dengan fonem nada tersebut. Perubahan tatabahasa yang melibatkan suprafiks yang diambil alih oleh fonem nada ini tidak jauh berbeza dengan perubahan fonologi dalam bahasa lain. Kedua-dua perubahan tersebut mempunyai sifat yang serupa, iaitu bermula daripada bahasa yang mengalami kelemahan, seperti hilangnya keseimbangan, sehingga muncul bentuk variasi yang dipilih oleh penuturnya. Bentuk variasi yang sering digunakan, baik dari segi bunyi mahupun tatabahasa, akan tersebar secara perlahan-lahan antara kelompok penutur dan akhirnya berkembang pesat.

Zulkifley dan Pareeda (2015) meneliti fenomena penghilangan konsonan dalam gugusan nasal-obstruen homorganik dalam dialek Melayu Patani. Kajian ini menggunakan pendekatan kualitatif yang berlandaskan Teori Fonologi Autosegmental Model KV. Dapatan kajian menunjukkan bahawa penghilangan salah satu konsonan dalam gugusan nasal-obstruen homorganik berpunca daripada proses *delinking* yang berkait rapat dengan faktor penyuaraan pada obstruen tersebut. Analisis data memperlihatkan bahawa apabila obstruen dalam gugusan tersebut mempunyai fitur [+suara], obstruen akan dihilangkan, seperti yang dapat diperhatikan pada kata /ləmbu/ yang direalisasikan sebagai [ləmu] ‘lembu’. Sebaliknya, apabila obstruen yang hadir dalam gugusan tersebut mempunyai fitur [-suara], konsonan nasal yang akan dihilangkan, seperti yang ditunjukkan oleh kata /bantal/ yang direalisasikan sebagai [bata] ‘bantal’.

Sareeyah (2016) mengkaji bentuk fonologi dialek Melayu Patani dari segi

inventori fonem konsonan dan vokal, serta proses fonologi yang terdapat dalam subvarian Saga dan Tannyung. Kajian ini menggunakan pendekatan Fonologi Struktural untuk menentukan ciri segmental, iaitu mengenal pasti bunyi vokal, konsonan, dan diftong dalam kedua-dua subvarian tersebut. Pendekatan yang sama juga diterapkan untuk menganalisis proses fonologi yang berlaku dalam subvarian Saga dan Tannyung. Dapatan kajian menunjukkan bahawa kedua-dua subvarian, iaitu Saga dan Tannyung masing-masing mengandungi 21 fonem konsonan, lapan fonem vokal, dan satu bunyi diftong, iaitu diftong [au]. Terdapat juga pengaruh bahasa Thai, di mana bunyi [t] berubah menjadi [t^h] dalam subvarian ini. Selain itu, satu proses fonologi dikenal pasti, iaitu perubahan diftong menjadi monoftong, di mana diftong [ai] dan [au] yang berada di posisi akhir kata akan berubah menjadi vokal rendah [a] dan vokal separuh rendah [ɛ] dalam subvarian ini.

Suraiya (2020) telah melakukan kajian untuk menganalisis bentuk fonologi dialek Melayu Patani, merangkumi inventori fonem vokal, inventori fonem konsonan, serta proses-proses fonologi yang terdapat dalam dialek tersebut. Hasil kajian menunjukkan bahawa dialek Melayu Patani mempunyai 12 fonem vokal yang boleh dibahagikan kepada tiga kategori, iaitu vokal oral, vokal terbitan, dan vokal nasal. Sementara itu, konsonan dalam dialek ini terdiri daripada 28 fonem, yang boleh dikelaskan kepada tiga jenis, iaitu konsonan asal, konsonan aspirasi, dan konsonan pinjaman. Struktur suku kata dalam dialek Melayu Patani pula dikategorikan sebagai pola suku kata jenis ketiga, iaitu pola KV(K). Akhir sekali, kajian ini juga mengenal pasti beberapa proses fonologi seperti pengguguran, asimilasi, glotalisasi, nasalisasi vokal, perubahan vokal dan monoftongisasi.

Kajian Dialektologi

Dialektologi merupakan satu bidang ilmu bahasa yang memerihalkan kepelbagaian varian sesuatu dialek (Chambers & Trudgill 1998). Pada dasarnya, dialektologi mempunyai beberapa subdisiplin lain dibawahnya mengikut kepada peredaran zaman dan mendasari cara pandangan pelopornya. Setiap disiplin itu pula kebiasaannya dipelopori oleh para sarjana terdahulu mengikut perkembangan dunia ilmu linguistik terutamanya dalam bidang dialektologi.

Kajian terawal yang membicarakan kepelbagaian varian dialek Melayu di semenanjung Malaysia terserlah menerusi sebuah penulisan berjudul The Endau and its Tributaries yang dihasilkan oleh Hervey D.F.A. pada tahun 1881. Penulisan ini menyerlahkan bentuk-bentuk pertuturan Sembrong yang dituturkan oleh masyarakat asli di pedalaman Pahang di samping turut turut membincangkan secara ringkas mengenai perbandingan bentuk pertuturan ‘speech’ sebagaimana yang dituturkan dari Johor, Pahang, Terengganu dan Kelantan. Penelitian dialek Melayu seterusnya diserlahkan oleh Sturrock A. J. pada tahun 1912. Penulisan beliau bertajuk Some notes on the Kelantan Dialect, and some

comparisons with the Dialects of Perak and Central Pahang merupakan cacatan beliau terhadap beberapa nota dialek Kelantan dan beberapa perbandingan dengan dialek Perak dan Pahang.

Selain variasi dialek Melayu, pengkaji eropah juga turut menyerlahkan minat terhadap variasi bahasa Orang Asli di Malaysia. Antara lainnya, kajian oleh Iskandar (1976) dan Benjamin Geoffrey (2012). Variasi bahasa Orang Asli di Malaysia dibukukan oleh Carey dengan tajuk Orang Asli. The Aboriginal Tribes of Peninsular Malaysia. Aspek variasi bahasa telah membantu beliau mendeskripsikan kewujudan pola sosial orang asli di Malaysia. Benjamin pula memerihalkan variasi bahasa Orang Asli di Malaysia menerusi makalah beliau yang bertajuk The Aslian Languages of Malaysia and Thailand: An assessment. Penulisan beliau telah dimanfaatkan oleh para pengkaji seterusnya untuk mengetahui tentang kewujudan atau taburan Orang Asli di Semenanjung Malaysia khususnya kumpulan-kumpulan Orang Asli yang wujud dan menghuni di pedalaman hulu negeri Terengganu.

Ismail Hussein adalah antara tokoh sarjana Melayu terawal membicarakan variasi dialek Melayu di Malaysia Penelitiannya dibukukan dalam tahun 1973 dengan tajuk Malay Dialect Peninsular. Beliau tekah membahagikan dialek-dialek Melayu yang terdapat di semenanjung Malaysia kepada 14 buah kelompok iaitu kelompok dialek jenis Kelantan, Pulai Chondong, Terengganu, Kedah, Sungai Perak, Pulau Sayong, Perak Tengah, Selangor, Negeri Sembilan, Melaka, Lenga, Johor, Pahang, dan Patani. Malay Dialect Peninsular bukan hanya sekadar suatu usaha perbandingan antara dialek-dialek Melayu (merangkumi dialek Melayu Patani) malah penulisan ini merupakan cerminan bidang ilmu dialektologi yang terawal dalam membincangkan tentang pembahagian dan pengelompokan dialek-dialek Melayu di semenanjung Malaysia. Ruslan (2011) mengemukakan beberapa ciri khas dialek Melayu Patani, antaranya kata ekasuku, vokal sengau, konsonan hembusan, dan konsonan panjang. Ciri-ciri ini dianggap sebagai ciri istimewa dialek Melayu Patani. Isu utama yang diberi tumpuan dalam kajian ini adalah kewujudan dan penyebaran ciri khas tersebut dalam subdialek-subdialek Melayu Patani. Berdasarkan data yang diperoleh dari lokasi penyelidikan, dialek Melayu Patani boleh dibahagikan kepada sepuluh variasi. Setiap variasi memiliki ciri-ciri yang berbeza, terutamanya dalam aspek bunyi dan semantik. Dapatan kajian mendapati bahawa terdapat beberapa fonem konsonan dan diftong yang penyebarannya tidak menyeluruh di antara variasi, iaitu fonem konsonan /f/, fonem konsonan /x/, konsonan hembusan, konsonan panjang, serta fonem diftong, yang hanya terdapat dalam beberapa variasi tertentu.

Ibrohim (2016, 2023) membincangkan isu berkaitan dengan pemetaan dialek geografi. Kajian ini memperlihatkan kesejajaran dan penyebaran dialek berdasarkan aspek fonologi dan leksikal dalam dialek Melayu Patani varian Yaha, serta melihat persamaan dan perbezaan

antara varian yang dituturkan di kawasan Yaha. Pengkaji menggunakan kaedah pemetaan dialek geografi yang diterapkan dalam kajian dialektologi dengan menggunakan pendekatan dialektologi sinkronik secara deskriptif. Analisis yang dilakukan mendapati adanya kesejajaran dan penyebaran sistem fonologi vokal dan konsonan di beberapa kawasan kampung di Yaha. Data leksikal pula memperlihatkan adanya kelainan antara kawasan kampung di Yaha. Secara keseluruhannya, kajian ini merumuskan bahawa terdapat tiga kelompok utama di daerah Yaha, iaitu varian Yaha asli, varian pendatang, dan varian percampuran dialek.

Rahim et al. (2021) mengemukakan isu berkaitan dengan pemetaan dialek geografi. Kajian ini memperlihatkan kesejajaran dan penyebaran berdasarkan aspek fonologi dan leksikal yang terdapat di daerah Waeng, wilayah Narathiwat. Pengkaji menggunakan kaedah pemetaan dialek geografi yang dimanfaatkan dalam kajian dialektologi serta menggunakan pendekatan dialektologi sinkronik secara deskriptif. Dapatan kajian ini menunjukkan bahawa kesejajaran aspek fonologi dilihat lebih teratur dan sistematis berbanding dengan kesejajaran bentuk leksikal. Bentuk leksikal pula dilihat kebanyakan daftar kata yang disenaraikan dalam kajian ini memperlihat penyebaran yang bersimpang siur. Secara umumnya, kesejajaran dan penyebaran yang terdapat dalam variasi Waeng dapat dibahagikan kepada tiga variasi utama iaitu variasi Waeng asli, variasi luar atau variasi pendatang dan variasi percampuran dialek.

Kajian Linguistik Lain

Shahidi dan Mumad (2020) membincangkan isu yang berkaitan dengan fonetik akustik. Kajian ini memfokuskan kepada aspek penghasilan bunyi dan menjelaskan ciri-ciri realisasi fonetik dalam penghasilan ujaran konsonan panjang dalam dialek Melayu Patani. Pendekatan yang digunakan adalah pendekatan fonetik akustik. Ruang lingkup kajian ini meliputi bunyi letupan yang memanjangkan konsonan awal kata dalam dialek Melayu Patani serta pasangannya, iaitu bunyi konsonan biasa yang digunakan oleh penutur di masyarakat Patani. Analisis yang dilakukan menunjukkan bahawa pemanjangan konsonan wujud dalam dialek Melayu Patani, tetapi ia berlaku secara terhad, iaitu hanya pada bunyi-bunyi tertentu. Berdasarkan kajian ini, didapati bahawa hanya bunyi letupan bersuara yang bertepatan dengan konsep pemanjangan konsonan dalam dialek Melayu Patani.

Angsana dan Ilangko (2021) membincangkan perubahan konsonan dalam kata pinjaman dari bahasa Sanskrit dalam bahasa Thai dan dialek Melayu Patani. Kajian ini menggunakan 210 daftar kata. Dapatan kajian menunjukkan bahawa terdapat perubahan konsonan dalam kedua-dua bahasa, iaitu bahasa Thai dan dialek Melayu Patani. Beberapa jenis perubahan konsonan yang dikenal pasti dalam kata pinjaman Sanskrit adalah pengguguran konsonan, penyisipan konsonan, penyahsuara, penyuaraan, dan penggantian konsonan. Secara keseluruhannya, semua proses yang dibincangkan ini telah mengalami asimilasi dalam pertuturan bahasa Thai dan

dialek Melayu Patani, dan masih digunakan sehingga kini.

Abdonloh et al. (2022) membincangkan semakan semula kata pinjaman bahasa Thai dalam dialek Melayu Patani dari segi perubahan makna dengan membandingkan makna kedua-dua kata tersebut. Hasil kajian ini mendapati bahawa terdapat perkataan yang masih mengekalkan makna asal, manakala ada juga kata-kata yang telah berubah maknanya. Perkataan yang berubah makna telah mengalami asimilasi dalam bentuk perkataannya, sehingga ia sebati dengan sistem dialek Melayu Patani, dan penuturnya sendiri tidak sedar bahawa itu adalah kata pinjaman. Terdapat dua jenis peminjaman bahasa Thai dalam dialek Melayu Patani, iaitu peminjaman tanpa perubahan makna dan peminjaman yang berubah makna. Peminjaman yang berubah makna pula boleh dibahagikan kepada tiga jenis perubahan makna, iaitu peluasan makna, penyempitan makna, dan pertukaran makna. Secara keseluruhan, peminjaman kata ini bukan sahaja memenuhi keperluan penggunaan harian, tetapi juga memperkayakan korpus dan perbendaharaan kata dialek Melayu Patani.

Meskipun kajian-kajian terdahulu telah meneliti pelbagai aspek dialek Melayu Patani dari sudut fonologi, leksikal, dan pemetaan dialek, masih terdapat ruang untuk kajian menumpukan kepada rekonstruksi fonem konsonan proto dialek ini berdasarkan analisis perbandingan antara variasi dialek yang terdapat di wilayah Patani. Usaha rekonstruksi berkenaan membolehkan pengkaji mengenal pasti serta menapis elemen asing dalam sistem fonologi dialek Melayu Patani, khususnya ciri-ciri yang mungkin terhasil daripada pertembungan budaya dan bahasa hasil pengaruh fonologi keluarga bahasa Tai-Kadai. Dengan demikian, kajian ini berupaya merekonstruksi bentuk konsonan proto dialek Melayu Patani yang lebih autentik, sekali gus menilai hubungan antara inovasi dan retensi fonologi dialek ini dalam hubungannya dengan Malayik Purba (MP) seperti yang direkonstruksi oleh Adelaar (1992).

METODOLOGI KAJIAN

Kajian ini bertujuan untuk merekonstruksi bentuk purba dialek Melayu Patani, khususnya di wilayah Narathiwat. Pendekatan yang digunakan dalam kajian ini ialah metode kualitatif berdasarkan pendekatan linguistik sejarawi. Dua kajian utama diterapkan dalam penelitian ini untuk mendapatkan maklumat dan data linguistik, iaitu kajian kepustakaan dan kajian lapangan.

Kajian kepustakaan melibatkan pengumpulan data sekunder berkaitan dialek Melayu Patani daripada pelbagai sumber akademik seperti tesis, jurnal, kertas kerja, dan bahan ilmiah berkaitan. Kajian lapangan pula merupakan cara untuk memperoleh data segar mengenai sesuatu gejala dalam masyarakat (Asmah, 2015). Selain itu, kaedah lapangan juga melibatkan lokasi kajian, pemilihan informan, pengumpulan data, penganalisisan data serta pemaparan data.

Pemilihan Informan

Sarjana Barat mencadangkan bahawa informan lelaki lebih sesuai dalam penyelidikan linguistik lapangan (Chambers & Trudgill, 2004). Namun, dalam konteks Asia, informan wanita cenderung memiliki leksikon dialek ibunda yang lebih luas (Ayatrohaedi, 1979). Meskipun begitu, norma adat sering menjadikan lelaki sebagai pihak yang lebih berperanan dalam interaksi dengan penyelidik, sekali gus menyulitkan proses pengumpulan data. Oleh itu, kajian ini tidak mengehadkan pemilihan informan kepada mana-mana jantina namun masih perlu untuk menghormati norma dan pantang larang lokaliti yang disantuni (Asmah, 2015).

Kemudian, informan juga perlu terdiri daripada mereka yang berusia[1]. Faktor usia turut diambil kira, memandangkan warga emas dipercayai lebih kalis terhadap pengaruh urbanisasi dan penstandardan bahasa moden, menjadikan mereka mampu menjadi wakil masyarakat setempatnya (Allen, 1971). Dari segi lokaliti, kajian memberi tumpuan kepada penempatan asli masyarakat Melayu di Patani, kerana kawasan luar bandar lebih terpelihara daripada perubahan linguistik yang pesat (Chambers & Trudgill, 2004).

Akhir sekali, informan dipilih dalam kalangan individu yang mengamalkan gaya hidup sedentari[2], kerana keterbatasan interaksi dengan faktor luar membantu mereka mengekalkan dialek tradisional. Keadaan ini memudahkan penyelidik mendapatkan gambaran yang lebih jelas tentang bentuk linguistik asal sesuatu bahasa. Dalam kajian ini, seorang informan dipilih bagi mewakili setiap lokaliti kajian. Secara keseluruhannya, seramai enam orang informan (lingkungan umur antara 45-60 tahun) terlibat dalam kajian ini, yang terdiri daripada tiga orang informan lelaki dan tiga orang informan perempuan.

Lokasi Kajian

Kajian ini dijalankan di wilayah Narathiwat. Dalam kajian ini hanya tiga buah daerah di wilayah Narathiwat yang dijadikan sebagai tempat atau kawasan pengkajian iaitu daerah Waeng, daerah Sungai Kolok dan daerah Sungai Padi. Kampung yang terlibat dalam kajian ini adalah sebanyak enam buah kampung iaitu Kresor (KRS), Buketa (BKT), Puyok (PYK), Munok (MNK), Benae Luwas (BNL) dan Aikubu (AKB). Ketiga-tiga daerah tersebut dipilih kerana masyarakat setempat masih mengekalkan ciri-ciri budaya Melayu dari aspek bahasa, gaya hidup dan amalan tradisi. Daripada 200 daftar kata yang digunakan dalam temu bual di lapangan, hanya sebahagian daripadanya

[1] Sebahagian sarjana seperti Chambers dan Trudgill (1998) memberikan julat umur untuk seseorang itu diambil sebagai informan. Mereka menyatakan umur 60 tahun ke atas merupakan calon yang sesuai sedangkan penyelidik yang lain mencadangkan julat umur yang lebih rendah untuk meninjau potensi perubahan bahasa (Linn 1983).

[2] Sedentari merujuk kepada individu yang tetap berada di penempatannya dan tidak berpindah atau sangat terbatas akan pergerakannya. Individu ini sering dijadikan perbandingan dengan mereka yang dianggap '*mobile'* yang sering keluar daripada kawasan penempatan sehingga kualiti atau dialek ibundanya kian bercampur baur dengan ciri fonologi bahasa asing.

dipilih untuk dianalisis sebagai data kajian. Daftar kata yang sama digunakan di keenam-enam lokasi kajian bagi memastikan data yang diperoleh dapat dibandingkan.

Teknik Pencuplikan Data

Terdapat dua jenis metode pengumpulan data, iaitu metode semak dan metode cakap (Mahsun, 2005). Teknik yang digunakan meliputi pencatatan, temu bual, perakaman, pengajuan gambar, dan senarai daftar kata. Senarai daftar kata yang digunakan dalam kajian ini terdiri daripada 200 kosa kata yang merangkumi lapan bidang semantik iaitu alam persekitaran, warna, kata kerja, kata adjektif, alat kelengkapan rumah tangga, istilah kekerabatan, anggota tubuh manusia dan anggota tubuh haiwan.

Pada fasa awal, penyelidik mengumpulkan data demografi serta latar belakang informan, diikuti fasa pencuplikan yang menggunakan senarai kata daripada glos bahasa Melayu sebagai instrumen temu bual. Dalam temu bual, informan diminta menyebut bentuk setempat bagi glos yang diajukan, sama ada melalui soalan terbuka atau pembayang, seperti "Pakcik, kalau dalam sesebuah keluarga, mesti ada pasangan ibu dan ....". Teknik pengajuan gambar turut digunakan untuk merangsang respons informan.

Setelah data dikumpulkan, penyelidik mentransliterasikan unsur auditori ke dalam simbol International Phonetic Alphabet (IPA). Ketepatan simbol-simbol ini memastikan analisis fonetik dapat dilakukan secara sistematik dan objektif.

Kerangka Teoretikal

Linguistik sejarawi adalah salah satu cabang ilmu yang mengkaji bahasa secara diakronik, iaitu dengan membandingkan data bahasa tertentu untuk melihat perubahan dan perkembangan yang berlaku dalam tempoh masa tertentu. Cabang ilmu bahasa ini dikembangkan untuk memperoleh bentuk purba sesuatu bahasa yang tidak mempunyai naskhah bertulis. Sebelum membincangkan kaedah rekonstruksi bahasa atau dialek purba, terdapat lima istilah penting yang perlu difahami terlebih dahulu (Rahim, 2017):

1. **Bahasa Purba:** yakni bahasa hipotesis yang dianggap menurunkan beberapa bahasa yang nyata ataupun bahasa yang terhasil daripada proses rekonstruksi bahasa-bahasa turunan yang dibandingkan.
2. **Bahasa Kerabat:** bahasa yang berkait antara satu dengan lain dan moyang bahasa ini adalah bersumberkan bahasa purba yang sama.
3. **Kata Kognat:** kata yang memiliki kesamaan bentuk dan makna dengan kata lain dalam bahasa yang berbeza, tetapi bahasa-bahasa yang berbeza itu diturunkan daripada sumber bahasa purba yang sama.
4. **Korespondensi Bunyi:** seperangkat set bunyi kata-kata kognat yang telah dikumpulkan daripada beberapa bahasa turunan.
5. **Refleks:** bentuk kata atau unsur purba yang wujud daripada beberapa bahasa turunan.

Seterusnya, kaedah merekonstruksi sesuatu bahasa purba memiliki kriteria seperti berikut (Crowley & Bowern, 2010; Rahim, 2017):

1. Menentukan kata kognat bahasa yang ingin dibandingkan. Dengan kata lain, kata yang memperlihatkan persamaan bentuk dan makna perlu ditentukan terlebih dahulu. Namun, penentuan ini tidaklah boleh dilakukan selagi kata yang berunsurkan peminjaman, ikonik dan kebetulan tidak diasingkan terlebih dahulu. Setelah kata bukan kognat diasingkan, maka yang tinggal adalah kata yang berkognat seperti yang dipaparkan dalam Jadual 1.

2. Menyusun set korespondensi atau perangkat kesepadanan bunyi bahasa yang dibandingkan. Berasaskan data dalam Jadual 1, set korespondensi bunyi telah menyusun glos 'elak' dalam perangkat kesepadanan bunyi yang boleh dirujuk dalam Jadual 2.

3. Terdapat empat perangkat korespondensi seperti yang dilampirkan dalam Jadual 2, iaitu korespondensi pertama; Tonga /k/, Samoa /ʔ/, Rarotonga /k/ dan Hawaii /ʔ/. Korespondensi kedua dan keempat semua bahasa menunjukkan /a/ dan /o/. Korespondensi ketiga pula; Tonga /l/, Samoa /l/, Rarotonga /r/ dan Hawaii /l/. Keempat-empat perangkat korespondensi tersebut dapat dituliskan seperti dalam Jadual 3.

Jadual 1
Senarai kata yang telah melalui proses penapisan kognat

Makna	Tonga	Samoa	Rarotonga	Hawaii
pusat	pito	pute	pito	piko
larangan	tapu	tapu	tapu	kapu
akar	aka	aʔa	aka	aʔa
mulut	ŋutu	ŋutu	ŋutu	nuku
elak	kalo	ʔalo	karo	ʔalo

Sumber: Diperoleh dan diubah suai daripada Crowley dan Bowern (2010*)*

Jadual 2
Set korespondensi bunyi bahasa

Varian	Distribusi Perangkat Kesepadanan			
Tonga	k	a	l	o
Samoa	ʔ	a	l	o
Rarotonga	k	a	r	o
Hawaii	ʔ	a	l	o

Sumber: Diperoleh dan diubah suai daripada Crowley dan Bowern (2010)

Jadual 3
Pemaparan set korespondensi bunyi bahasa

Tonga	Samoa	Rarotonga	Hawaii
k:	ʔ:	k:	ʔ
a:	a:	a:	a
l:	l:	r:	l
o:	o:	o:	o

Sumber: Diperoleh dan diubah suai daripada Crowley dan Bowern (2010)

4. Penentuan fonem purba bergantung kepada kekerapan kehadirannya dalam pelbagai posisi kata dan variasi bentuk. Sebagai contoh, baris korespondensi ketiga dalam Jadual 3 menunjukkan bahawa /l/ lebih dominan berbanding /r/ dalam glos 'elak'. Oleh itu, secara hipotesis, /l/ berkemungkinan merupakan fonem purba. Namun, kepastian ini memerlukan pengujian lanjut melalui data tambahan untuk membuktikan bahawa (1) /l/ berfungsi sebagai fonem utama, manakala /r/ sebagai alternasi, dan (2) /l/ ialah fonem konsonan purba.

DAPATAN KAJIAN DAN PERBINCANGAN

Bahagian ini akan membincangkan hasil fonem konsonan dialek Melayu Patani Narathiwat purba (DMPNP) berdasarkan rekonstruksi fonem yang dilakukan ke atas data dari enam buah kampung, iaitu Kampung Kresor (KRS), Kampung Buketa (BKT), Kampung Puyok (PYK), Kampung Munok (MNK), Kampung Benae Luwas (BNL), dan Kampung Aikubu (AKB). Aspek yang akan dihuraikan meliputi jumlah inventori dan distribusi fonem DMPNP. Penyebaran fonem DMPNP ini juga akan menunjukkan keberadaan fonem dan bunyi fonem tersebut berdasarkan posisinya, iaitu posisi awal kata, tengah kata, dan akhir kata. Fonem purba akan ditandai dengan simbol (*).

Berdasarkan perangkat kesepadanan kosa kata yang telah direkonstruksikan, didapati bahawa DMPNP memiliki lapan belas fonem konsonan, yang terdiri daripada enam bunyi konsonan letupan iaitu *p, *t, *k, *b, *d, dan *g; empat bunyi konsonan sengauan iaitu *m, *n, *ɲ, dan *ŋ; tiga bunyi konsonan geseran iaitu *s, *h, dan *ɣ; dua bunyi konsonan letusan iaitu *ʧ dan *ʤ; satu bunyi konsonan sisian iaitu *l dan dua bunyi konsonan separuh vokal iaitu *w dan *j. Rujuk inventori konsonan DMPNP ini dalam Jadual 4.

Rekonstruksi Konsonan Letupan DMPNP

DMPNP memiliki enam fonem konsonan letupan, iaitu *p, *b, *t, *d, *k, dan *g. Konsonan letupan dua bibir tidak bersuara *p wujud pada posisi awal kata, tengah kata dan akhir kata. Kehadirannya dalam varian DMPN yang dibandingkan menunjukkan kesepadanan yang sangat konsisten.

Jadual 4
Inventori fonem konsonan purba dialek melayu patani narathiwat

		Dua-Bibir	Gigi-Gusi	Lelangit Keras	Lelangit Lembut	Glotis
Letupan	Tbs	*p	*t		*k	
	Bs	*b	*d		*ɡ	
Sengauan	Bs	*m	*n	*ɲ	*ŋ	
Geseran	Tbs		*s			*h
	Bs				*ɣ	
Letusan	Tbs			*ʧ		
	Bs			*ʤ		
Sisian	Bs		*l			
Separuh Vokal	Bs	*w		*j		

Konsonan DMPNP *p di awal dan tengah kata didapati hadir sebagai letupan dua bibir [p], manakala di akhir kata DMPNP *p hadir sebagai hentian glotal [ʔ] yang hanya berstatus alofon dalam DMPNP. Hasil rekonstruksi ini menunjukkan bahawa DMPNP *p adalah warisan langsung daripada MP *p dan refleks DMPNP *p adalah seperti yang dipaparkan dalam Jadual 5.

Konsonan letupan dua bibir bersuara *b wujud dalam lingkungan awal kata dan tengah kata sahaja. Kehadirannya dalam varian DMPN yang dibandingkan menunjukkan kesepadanan yang sangat konsisten. Keteraturan ini membolehkan konsonan DMPNP *b direkonstruksikan pada kedua-dua lingkungan kata tersebut. Hasil rekonstruksi ini menunjukkan bahawa DMPNP *b adalah warisan langsung daripada MP *b dan refleks DMPNP *b adalah seperti yang dipaparkan dalam Jadual 6.

Konsonan letupan gigi-gusi tidak bersuara *t hadir dalam lingkungan awal kata, tengah kata dan akhir kata. Kehadirannya dalam varian DMPN yang dibandingkan menunjukkan kesepadanan yang sangat konsisten. Konsonan DMPNP *t di awal dan tengah kata didapati hadir sebagai letupan gigi-gusi [t], manakala di akhir kata DMPNP *t hadir sebagai hentian glotal [ʔ] yang hanya berstatus alofon dalam DMPNP. Hasil rekonstruksi ini menunjukkan bahawa DMPNP *t adalah warisan langsung daripada MP *t dan refleks DMPNP *t adalah seperti yang dipaparkan dalam Jadual 7.

Konsonan letupan gigi-gusi bersuara *d wujud dalam lingkungan awal kata dan tengah kata sahaja. Kehadirannya dalam varian DMPN yang dibandingkan menunjukkan kesepadanan yang sangat konsisten. Keteraturan ini membolehkan konsonan DMPNP *d direkonstruksikan pada kedua-dua lingkungan kata tersebut. Hasil rekonstruksi ini menunjukkan bahawa DMPNP *d adalah warisan langsung daripada MP *d dan refleks DMPNP *d seperti yang dipaparkan dalam Jadual 8.

Jadual 5
*Taburan konsonan purba MP *p dalam DMPNP*

Bil.	Deskripsi Taburan
1	MP *pərut ‘perut’ > DMPNP *pəɣot; KRS, BKT, PYK dan MNK pəɣoʔ; BNL dan AKB pʰəɣoʔ
2	MP *pipi(ʔ) ‘pipi’ > DMPNP *pipi; KRS, BKT, PYK, MNK, BNL dan AKB pipiʲ
3	MP *rumput ‘rumput’ > DMPNP *ɣuput; KRS dan BNL upuʔ; BKT, PYK dan MNK ɣupuʔ; AKB ɣəpuʔ
4	MP *ipar ‘ipar’ > DMPNP *ipa; KRS, BKT, PYK, MNK, BNL dan AKB ipa
5	MP *hidup ‘hidup’ > DMPNP *hidop; KRS, BKT, PYK dan MNK hidoʔ; BNL dan AKB idoʔ
6	MP *sədəp ‘sedap’ > DMPNP *sədap; KRS, BKT, PYK, MNK, BNL dan AKB sədaʔ

Sumber: Data diperoleh melalui kajian lapangan

Jadual 6
*Taburan konsonan purba MP *b dalam DMPNP*

Bil.	Deskripsi Taburan
1	MP *bən̆ciʔ ‘benci’ > DMPNP *bəʧi; KRS, PYK, BNL dan AKB bəʧʰiʲ; BKT dan MNK bəʧiʲ
2	MP *buruŋ ‘burung’ > DMPNP *buɣoŋ; KRS, BKT, PYK, MNK, BNL dan AKB buɣoŋ
3	MP *buhaya ‘buaya’ > DMPNP *bəjɔ; KRS, BKT, PYK, MNK, BNL dan AKB bəjɔ
4	MP *ubat ‘ubat’ > DMPNP *hubat; KRS dan PYK hubaʔ; BKT dan MNK ubaʔ; BNL ɔbaʔ; AKB obaʔ
5	MP *ʧabut ‘cabut’ > DMPNP *ʧabut; KRS, BKT, PYK, MNK, BNL dan AKB ʧabuʔ

Sumber: Data diperoleh melalui kajian lapangan

Jadual 7
*Taburan konsonan purba MP *t dalam DMPNP*

Bil.	Deskripsi Taburan
1	MP *tali ‘tali’ > DMPNP *tali; KRS, BKT, PYK, MNK, BNL dan AKB taliʲ
2	MP * tidur ‘tidur’ > DMPNP *tido; KRS, BKT, PYK, MNK, BNL dan AKB tido
3	MP *pintaʔ/pintak ‘minta’ > DMPNP *mitɔk; KRS dan AKB mɛtɔʔ; BKT, PYK, MNK dan BNL mitɔʔ
4	MP *m/u(n)tah ‘muntah’ > DMPNP *mutɔh; KRS, BKT, PYK, MNK, BNL dan AKB mutɔh
5	MP *ubat ‘ubat’ > DMPNP *hubat; KRS dan PYK hubaʔ; BKT dan MNK ubaʔ; BNL ɔbaʔ; AKB obaʔ
6	MP *ʧabut ‘cabut’ > DMPNP *ʧabut; KRS, BKT, PYK, MNK, BNL dan AKB ʧabuʔ

Sumber: Data diperoleh melalui kajian lapangan

Jadual 8
*Taburan konsonan purba MP *d dalam DMPNP*

Bil.	Deskripsi Taburan
1	MP *dahan ‘dahan’ > DMPNP *dɛhɛ; KRS, BKT, PYK dan MNK dɛhɛ; BNL dan AKB dahɛ
2	MP *dagu ‘dagu’ > DMPNP *dagu; KRS, BKT, PYK, MNK, BNL dan AKB daguʷ
3	MP *darah ‘darah’ > DMPNP *daɣɔh; KRS, BKT, PYK, MNK, BNL dan AKB daɣɔh
4	MP *hiduŋ ‘hidung’ > DMPNP *hidoŋ; KRS, BKT, PYK dan MNK hidoŋ; BNL dan AKB idoŋ
5	MP *adiʔ ‘adik’ > DMPNP *adek; KRS, BKT, PYK, MNK, BNL dan AKB adeʔ

Sumber: Data diperoleh melalui kajian lapangan

Konsonan letupan lelangit lembut tidak bersuara *k wujud dalam lingkungan awal kata, tengah kata dan akhir kata. Kehadirannya dalam varian DMPN yang dibandingkan menunjukkan kesepadanan yang sangat konsisten. Konsonan DMPNP *k di awal dan tengah kata didapati hadir sebagai letupan lelangit lembut [k], manakala di akhir kata DMPNP *k hadir sebagai hentian glotal [ʔ] yang hanya berstatus alofon dalam DMPNP. Hasil rekonstruksi ini menunjukkan bahawa DMPNP *k adalah warisan langsung daripada MP *k dan refleks DMPNP *k. Rujukan ini dapat diperhatikan dengan lebih teliti dalam Jadual 9.

Konsonan letupan lelangit lembut bersuara *g wujud dalam lingkungan awal kata dan tengah kata sahaja. Kehadirannya dalam varian DMPN yang dibandingkan menunjukkan kesepadanan yang sangat konsisten. Keteraturan ini membolehkan konsonan DMPNP *g direkonstruksikan pada kedua-dua lingkungan kata tersebut. Hasil rekonstruksi ini menunjukkan bahawa DMPNP *g adalah warisan langsung daripada MP *g dan refleks DMPNP *g adalah seperti yang dipaparkan dalam Jadual 10.

Jadual 9
*Taburan konsonan purba MP *k dalam DMPNP*

Bil.	Deskripsi Taburan
1	MP *kəriŋ ‘kering’ > DMPNP *kəɣiŋ; KRS, PYK, BNL dan AKB kʰəɣiŋ; BKT dan MNK kəɣiŋ
2	MP *kunit ‘kuning’ > DMPNP *kuniŋ; KRS, BKT, PYK, MNK, BNL dan AKB kuniŋ
3	MP *aŋkat ‘angkat’ > DMPNP *akat; KRS, BNL dan AKB akɛʔ; BKT, PYK dan MNK akaʔ
4	MP *ikan ‘ikan’ > DMPNP *ikɛ; KRS, BKT, PYK, MNK, BNL dan AKB ikɛ
5	MP *gəmuk ‘gemuk’ > DMPNP *gəmuk; KRS, BKT, PYK dan MNK gəmuʔ; BNL dan AKB gəməʔ
6	MP *adiʔ ‘adik’ > DMPNP *adek; KRS, BKT, PYK, MNK, BNL dan AKB adeʔ

Sumber: Data diperoleh melalui kajian lapangan

Jadual 10
*Taburan konsonan purba MP *g dalam DMPNP*

Bil.	Deskripsi Taburan
1	MP *gəmuk ‘gemuk’ > DMPNP *gəmuk; KRS, BKT, PYK dan MNK gəmuʔ; BNL dan AKB gəməʔ
2	MP *guruh ‘guruh’ > DMPNP *guɣoh; KRS, BKT, PYK, MNK, BNL dan AKB guɣoh
3	MP *gigi ‘gigi’ > DMPNP *gigi; KRS, BKT, PYK, MNK, BNL dan AKB gigiʲ
4	MP *dagu ‘dagu’ > DMPNP *dagu; KRS, BKT, PYK, MNK, BNL dan AKB daguʷ
5	MP *saguʔ ‘sagu’ > DMPNP *sagu; KRS, BKT, PYK, MNK, BNL dan AKB saguʷ

Sumber: Data diperoleh melalui kajian lapangan

Rekonstruksi Konsonan Sengauan DMPNP

DMPNP memiliki empat fonem konsonan sengauan, iaitu *m, *n, *ɲ dan *ŋ. Konsonan sengauan dua bibir bersuara *m wujud dalam lingkungan awal kata dan tengah kata sahaja. Kehadirannya dalam varian DMPN yang dibandingkan menunjukkan kesepadanan yang sangat konsisten. Keteraturan ini membolehkan konsonan DMPNP *m direkonstruksikan pada kedua-dua lingkungan kata tersebut. Hasil rekonstruksi ini menunjukkan bahawa DMPNP *m adalah warisan langsung daripada MP *m dan refleks DMPNP *m adalah seperti yang dipaparkan dalam Jadual 11.

Konsonan sengauan gigi-gusi bersuara *n wujud dalam lingkungan awal kata dan tengah kata sahaja. Kehadirannya dalam varian DMPN yang dibandingkan menunjukkan kesepadanan yang sangat konsisten. Keteraturan ini membolehkan konsonan DMPNP *n direkonstruksikan pada kedua-dua lingkungan kata tersebut. Hasil rekonstruksi ini menunjukkan bahawa DMPNP *n adalah warisan langsung daripada MP *n dan refleks DMPNP *n adalah seperti yang dipaparkan dalam Jadual 12.

Konsonan sengauan lelangit keras bersuara *ɲ wujud dalam lingkungan awal kata dan tengah kata sahaja. Kehadirannya

Jadual 11
*Taburan konsonan purba MP *m dalam DMPNP*

Bil.	Deskripsi Taburan
1	MP *muka ‘muka’ > DMPNP *mukɔ; KRS, BKT, PYK dan MNK mukɔ; BNL dan AKB mukʰɔ
2	MP *miñak ‘minyak’ > DMPNP *miɲɔk; KRS, BKT, PYK, MNK, BNL dan AKB miɲɔʔ
3	MP *mata ‘mata’ > DMPNP *matɔ; KRS, BKT, PYK, MNK, BNL dan AKB matɔ
4	MP *gəmuk ‘gemuk’ > DMPNP *gəmuk; KRS, BKT, PYK dan MNK gəmuʔ; BNL dan AKB gəmɔʔ
5	MP *ləmək ‘lemak’ > DMPNP *ləmɔk; KRS, BKT, PYK, MNK, BNL dan AKB ləmɔʔ

Sumber: Data diperoleh melalui kajian lapangan

Jadual 12
*Taburan konsonan purba MP *n dalam DMPNP*

Bil.	Deskripsi Taburan
1	MP *nasiʔ ‘nasi’ > DMPNP *nasik; KRS, BKT, PYK, MNK, BNL dan AKB nasiʔ
2	MP *nipis ‘nipis’ > DMPNP *nipih; KRS, BKT, PYK, MNK, BNL dan AKB nipih
3	MP *k/anan ‘kanan’ > DMPNP *kanɛ; KRS, BKT, PYK dan MNK kanɛ; BNL dan AKB kʰanɛ
4	MP *kunit ‘kuning’ > DMPNP *kuniŋ; KRS, BKT, PYK, MNK, BNL dan AKB kuniŋ
5	MP *anak ‘anak’ > DMPNP *anɔk; KRS, BKT, PYK, MNK, BNL dan AKB anɔʔ

Sumber: Data diperoleh melalui kajian lapangan

Jadual 13
*Taburan konsonan purba MP *ɲ dalam DMPNP*

Bil.	Deskripsi Taburan
1	MP *ñamuk ‘nyamuk’ > DMPNP *ɲamɔk; KRS, BKT, PYK, MNK, BNL dan AKB ɲamɔʔ
2	MP *ñawa ‘nyawa’ > DMPNP *ɲawɔ̃; KRS, BKT, PYK, MNK, BNL dan AKB ɲawɔ̃
3	MP *miñak ‘minyak’ > DMPNP *miɲɔk; KRS, BKT, PYK, MNK, BNL dan AKB miɲɔʔ
4	MP *tañaʔ ‘tanya’ > DMPNP *taɲɔ; KRS, BKT, PYK, MNK, BNL dan AKB taɲɔ

Sumber: Data diperoleh melalui kajian lapangan

Jadual 14
*Taburan konsonan purba MP *ŋ dalam DMPNP*

Bil.	Deskripsi Taburan
1	MP *ŋaŋa(ʔ) ‘nganga’ > DMPNP *ŋaŋɔ; KRS, BKT, PYK, MNK, BNL dan AKB ŋaŋɔ
2	MP *aŋin ‘angin’ > DMPNP *aŋiŋ; KRS, BKT, PYK, MNK, BNL dan AKB aŋiŋ
3	MP *laŋit ‘langit’ > DMPNP *laŋit; KRS, BKT, PYK, MNK, BNL dan AKB laŋiʔ
4	MP *hiduŋ ‘hidung’ > DMPNP *hidoŋ; KRS, BKT, PYK dan MNK hidoŋ; BNL dan AKB idoŋ
5	MP *buruŋ ‘burung’ > DMPNP *buɣoŋ; KRS, BKT, PYK, MNK, BNL dan AKB buɣoŋ

Sumber: Data diperoleh melalui kajian lapangan

dalam varian DMPN yang dibandingkan menunjukkan kesepadanan yang sangat konsisten. Keteraturan ini membolehkan konsonan DMPNP *ɲ direkonstruksikan pada kedua-dua lingkungan kata tersebut. Hasil rekonstruksi ini menunjukkan bahawa DMPNP *ɲ adalah warisan langsung daripada MP *ɲ dan refleks DMPNP *ɲ. Dapatan ini dapat diperhalusi dalam Jadual 13.

Konsonan sengauan lelangit lembut bersuara *ŋ wujud dalam lingkungan awal kata dan tengah kata sahaja. Kehadirannya dalam varian DMPN yang dibandingkan menunjukkan kesepadanan yang sangat konsisten. Keteraturan ini membolehkan konsonan DMPNP *ŋ direkonstruksikan pada kedua-dua lingkungan kata tersebut. Hasil rekonstruksi ini menunjukkan bahawa DMPNP *ŋ adalah warisan langsung daripada MP *ŋ dan refleks DMPNP *ŋ adalah seperti yang dipaparkan dalam Jadual 14.

Rekonstruksi Konsonan Geseran DMPNP

DMPNP memiliki tiga fonem konsonan geseran, iaitu *s, *ɣ, dan *h. Konsonan geseran gigi-gusi tidak bersuara *s wujud dalam lingkungan awal kata, tengah kata dan akhir kata. Kehadirannya dalam varian DMPN yang dibandingkan menunjukkan kesepadanan yang sangat konsisten. Konsonan DMPNP *s di awal dan tengah kata didapati hadir sebagai geseran gigi-gusi [s], manakala di akhir kata DMPNP *s hadir sebagai geseran glotal [h]. Hasil rekonstruksi ini menunjukkan bahawa

DMPNP *s adalah warisan langsung daripada MP *s dan refleks DMPNP *s. Perkara ini dapat diperhatikan dengan lebih jelas dalam Jadual 15.

Konsonan geseran lelangit lembut bersuara *ɣ wujud dalam lingkungan awal kata dan tengah kata sahaja. Kehadirannya dalam varian DMPN yang dibandingkan menunjukkan kesepadanan yang sangat konsisten. Keteraturan ini membolehkan konsonan DMPNP *ɣ direkonstruksikan pada kedua-dua lingkungan kata tersebut. Hasil rekonstruksi ini menunjukkan bahawa DMPNP *ɣ adalah warisan langsung daripada MP *ɣ dan refleks DMPNP *ɣ adalah seperti yang dipaparkan dalam Jadual 16.

Konsonan geseran glotis tidak bersuara *h wujud dalam lingkungan awal kata, tengah kata dan akhir kata. Kehadirannya dalam varian DMPN yang dibandingkan menunjukkan kesepadanan yang sangat konsisten. Keteraturan ini membolehkan konsonan DMPNP *h direkonstruksikan pada ketiga-tiga lingkungan kata tersebut. Hasil rekonstruksi ini menunjukkan bahawa DMPNP *h adalah warisan langsung daripada MP *h dan refleks DMPNP *h adalah seperti yang dipaparkan dalam Jadual 17.

Jadual 15
*Taburan konsonan purba MP *s dalam DMPNP*

Bil.	Deskripsi Taburan
1	MP *səmpit ‘sempit’ > DMPNP *səpet; KRS, BKT, PYK, MNK, BNL dan AKB səpeʔ
2	MP *sakit ‘sakit’ > DMPNP *saket; KRS, BKT, PYK, MNK, BNL dan AKB sakeʔ
3	MP *hi(ŋ)sep ‘hisap’ > DMPNP *hisap; KRS, BKT, PYK dan MNK hisaʔ; BNL dan AKB isaʔ
4	MP *pasir ‘pasir’ > DMPNP *pase; KRS, BKT, PYK, MNK, BNL dan AKB pase
5	MP *panas ‘panas’ > DMPNP *panah; KRS, BKT, PYK, MNK, BNL dan AKB panah
6	MP *bəras ‘beras’ > DMPNP *bəɣah; KRS, BKT, PYK, MNK, BNL dan AKB bəɣah

Sumber: Data diperoleh melalui kajian lapangan

Jadual 16
*Taburan konsonan purba MP *r dalam DMPNP*

Bil.	Deskripsi Taburan
1	MP *rumput ‘rumput’ > DMPNP *ɣuput; BKT, PYK dan MNK ɣupuʔ; BNL dan KRS upuʔ; AKB ɣəpuʔ
2	MP *rusuk ‘rusuk’ > DMPNP *ɣusok; KRS, BKT, PYK, MNK, BNL dan AKB ɣusoʔ
3	MP *urat ‘urat’ > DMPNP *ɔɣat; KRS, BKT, PYK dan MNK ɔɣaʔ; BNL dan AKB uɣaʔ
4	MP *bəras ‘beras’ > DMPNP *bəɣah; KRS, BKT, PYK, MNK, BNL dan AKB bəɣah
5	MP *duriʔ ‘duri’ > DMPNP *duɣi; KRS, BKT, PYK, MNK, BNL dan AKB duɣiʲ

Sumber: Data diperoleh melalui kajian lapangan

Jadual 17
*Taburan konsonan purba MP *h dalam DMPNP*

Bil.	Deskripsi Taburan
1	MP *hi(ŋ)sep ‘hisap’ > DMPNP *hisap; KRS, BKT, PYK dan MNK hisaʔ; BNL dan AKB isaʔ
2	MP *hijaw ‘hijau’ > DMPNP *hiʤa; KRS, BKT, PYK dan MNK hiʤa; BNL dan AKB iʤa
3	MP *puhun ‘pokok’ > DMPNP *pɔhoŋ; KRS, BKT, PYK dan MNK pɔhoŋ; BNL pahoŋ; AKB pahaᵘŋ
4	MP *dahan ‘dahan’ > DMPNP *dɛhɛ; KRS, BKT, PYK dan MNK dɛhɛ; BNL dan AKB dahɛ
5	MP *rumah ‘rumah’ > DMPNP *ɣumɔh; BKT, PYK dan MNK ɣumɔh; BNL dan KRS umɔh; AKB ɣɔmɔh
6	MP *m/u(n)tah ‘muntah’ > DMPNP *mutɔh; KRS, BKT, PYK, MNK, BNL dan AKB mutɔh

Sumber: Data diperoleh melalui kajian lapangan

Rekonstruksi Konsonan Letusan DMPNP

DMPNP memiliki dua fonem konsonan letusan, iaitu *ʧ dan *ʤ. Konsonan letusan lelangit keras tidak bersuara *ʧ wujud dalam lingkungan awal kata dan tengah kata sahaja. Kehadirannya dalam varian DMPN yang dibandingkan menunjukkan kesepadanan yang sangat konsisten. Keteraturan ini membolehkan konsonan DMPNP *ʧ direkonstruksikan pada kedua-dua lingkungan kata tersebut. Hasil rekonstruksi ini menunjukkan bahawa DMPNP *ʧ adalah warisan langsung daripada MP *ʧ dan refleks DMPNP *ʧ. Perkara ini dapat diperhatikan dengan lebih dekat dalam Jadual 18.

Konsonan letusan lelangit keras bersuara *ʤ wujud dalam lingkungan awal kata dan tengah kata sahaja. Kehadirannya dalam varian DMPN yang dibandingkan menunjukkan kesepadanan yang sangat konsisten. Keteraturan ini membolehkan konsonan DMPNP *ʤ direkonstruksikan pada kedua-dua lingkungan kata tersebut. Hasil rekonstruksi ini menunjukkan bahawa DMPNP *ʤ adalah warisan langsung daripada MP *ʤ dan refleks DMPNP *ʤ adalah seperti yang dipaparkan dalam Jadual 19.

Jadual 18
*Taburan konsonan purba MP *c dalam DMPNP*

Bil.	Deskripsi Taburan
1	MP *cabut ‘cabut’ > DMPNP *ʧabut; KRS, BKT, PYK, MNK, BNL dan AKB ʧabuʔ
2	MP *cucuʔ ‘cucu’ > DMPNP *ʧuʧu; KRS, BKT, PYK, MNK, BNL dan AKB ʧuʧuʷ
3	MP *bənc̃iʔ ‘benci’ > DMPNP *bəʧĩ; KRS, PYK, BNL dan AKB bəʧʰiʲ; BKT dan MNK bəʧĩʲ
4	MP *caciŋ ‘cacing’ > DMPNP *ʧaʧiŋ; KRS, BKT, PYK, MNK, BNL dan AKB ʧaʧiŋ
5	MP *cacat ‘cacat’ > DMPNP *ʧaʧat; KRS, BKT, PYK, MNK, BNL dan AKB ʧaʧaʔ

Sumber: Data diperoleh melalui kajian lapangan

Jadual 19
*Taburan konsonan purba MP *j dalam DMPNP*

Bil.	Deskripsi Taburan
1	MP *jarum 'jarum' > DMPNP *ʤaɣoŋ; KRS, BKT, PYK dan MNK ʤaɣoŋ; BNL dan AKB jaɣoŋ
2	MP *jari 'jari' > DMPNP *ʤaɣi; KRS, BKT, PYK dan MNK ʤaɣiʲ; BNL dan AKB jaɣiʲ
3	MP *hujan 'hujan' > DMPNP *huʤɛ; KRS, BKT, PYK dan MNK huʤɛ; BNL dan AKB uʤɛ
4	MP *hijaw 'hijau' > DMPNP *hiʤa; KRS, BKT, PYK dan MNK hiʤa; BNL dan AKB iʤa
5	MP *tajəm 'tajam' > DMPNP *taʤɛ; KRS, BKT, PYK, MNK, BNL dan AKB taʤɛ

Sumber: Data diperoleh melalui kajian lapangan

Jadual 20
*Taburan konsonan purba MP *l dalam DMPNP*

Bil.	Deskripsi Taburan
1	MP *ləmək 'lemak' > DMPNP *ləmək; KRS, BKT, PYK, MNK, BNL dan AKB ləməʔ
2	MP *ludah 'ludah' > DMPNP *ludɔh; KRS, BKT, PYK, MNK, BNL dan AKB ludɔh
3	MP *libar 'lebar' > DMPNP *lɛba; KRS, BKT, PYK, MNK, BNL dan AKB lɛba
4	MP *kulit 'kulit' > DMPNP *kulet; KRS, BKT, PYK, MNK, BNL dan AKB kuleʔ
5	MP *mulut 'mulut' > DMPNP *mulot; KRS, BKT, PYK, MNK, BNL dan AKB muloʔ

Sumber: Data diperoleh melalui kajian lapangan

Rekonstruksi Konsonan Sisian DMPNP

Konsonan sisian gigi-gusi bersuara *l wujud dalam lingkungan awal kata dan tengah kata sahaja. Kehadirannya dalam varian DMPN yang dibandingkan menunjukkan kesepadanan yang sangat konsisten. Keteraturan ini membolehkan konsonan DMPNP *l direkonstruksikan pada kedua-dua lingkungan kata tersebut. Hasil rekonstruksi ini menunjukkan bahawa DMPNP *l adalah warisan langsung daripada MP *l dan refleks DMPNP *l adalah seperti yang dipaparkan dalam Jadual 20.

Rekonstruksi Konsonan Separuh Vokal DMPNP

DMPNP memiliki dua buah fonem konsonan separuh vokal yang terdiri daripada konsonan separuh vokal *w dan *j. Konsonan separuh vokal dua-bibir bersuara *w wujud dalam lingkungan tengah kata dan akhir kata sahaja. Kehadirannya dalam varian DMPN yang dibandingkan menunjukkan kesepadanan yang sangat konsisten. Konsonan DMPNP *w di akhir kata didapati wujud dalam bentuk geluncuran yang dilemahkan iaitu [-ʷ]. Keteraturan ini membolehkan konsonan DMPNP *w direkonstruksikan dalam varian DMPN. Hasil rekonstruksi ini menunjukkan bahawa DMPNP *w adalah warisan langsung daripada MP *w dan refleks DMPNP *w adalah seperti yang dilampirkan dalam Jadual 21.

Konsonan separuh vokal lelangit keras bersuara *j wujud dalam lingkungan tengah kata dan akhir kata sahaja.

Jadual 21
*Taburan konsonan purba MP *w dalam DMPNP*

Bil.	Deskripsi Taburan
1	MP *bawaŋ ‘bawang’ > DMPNP *bawɛ; KRS, BKT, PYK, MNK, BNL dan AKB bawɛ
2	MP *a(bw)an ‘awan’ > DMPNP *awɛ; KRS, BKT, PYK, MNK, BNL dan AKB awɛ
3	MP *ñawa ‘nyawa’ > DMPNP *ɲawɔ̃; KRS, BKT, PYK, MNK, BNL dan AKB ɲawɔ̃
4	MP *batu ‘batu’ > DMPNP *batu; KRS, BKT, PYK, MNK, BNL dan AKB batuʷ
5	MP *cucuʔ ‘cucu’ > DMPNP *ʧuʧu; KRS, BKT, PYK, MNK, BNL dan AKB ʧuʧuʷ

Sumber: Data diperoleh melalui kajian lapangan

Jadual 22
*Taburan konsonan purba MP *y dalam DMPNP*

Bil.	Deskripsi Taburan
1	MP *hayam ‘ayam’ > DMPNP *hajɛ; KRS, PYK, BNL dan AKB hajɛ; BKT dan MNK ajɛ
2	MP *kayuʔ ‘kayu’ > DMPNP *kaju; KRS, BKT, PYK, MNK, BNL dan AKB kajuʷ
3	MP *buhaya ‘buaya’ > DMPNP *bɔjɔ; KRS, BKT, PYK, MNK, BNL dan AKB bɔjɔ
4	MP *jari ‘jari’ > DMPNP *ʤaɣi; KRS, BKT, PYK dan MNK ʤaɣiʲ; BNL dan AKB jaɣiʲ
5	MP *gigi ‘gigi’ > DMPNP *gigi; KRS, BKT, PYK, MNK, BNL dan AKB gigiʲ

Sumber: Data diperoleh melalui kajian lapangan

Kehadirannya dalam varian DMPN yang dibandingkan menunjukkan kesepadanan yang sangat konsisten. Konsonan DMPNP *j di akhir kata didapati wujud dalam bentuk geluncuran yang dilemahkan iaitu [ʲ]. Keteraturan ini membolehkan konsonan DMPNP *j direkonstruksikan dalam varian DMPN. Hasil rekonstruksi ini menunjukkan bahawa DMPNP *j adalah warisan langsung daripada MP *j dan refleks DMPNP *j adalah seperti yang dipaparkan dalam Jadual 22.

PERBINCANGAN

Bahagian ini membincangkan hasil analisis rekonstruksi dialek Melayu Pattani-Narathiwat Purba (DMPNP) dengan menilai aspek inovasi dan retensi dalam perbandingan dengan Malayik Purba (MP). Perbandingan ini bertujuan untuk menentukan sejauh mana DMPNP mengekalkan ciri fonologi MP atau mengalami inovasi.

Selain itu, bahagian ini turut meneliti unsur fonologi asing yang diserap dalam DMPNP, sekali gus memperlihatkan bagaimana varian DMPNP menyesuaikan diri dalam masyarakat yang mengutamakan penggunaan bahasa bukan ibunda. Akhirnya, perbincangan ini diakhiri dengan cadangan kajian lanjutan bagi memperluaskan skop penyelidikan serta meneroka dimensi baharu dalam rekonstruksi fonologi DMPNP.

Inovasi dan Retensi antara Malayik Purba (MP) dan Dialek Melayu Pattani Narathiwat Purba (DMPNP)

Dapatan rekonstruksi konsonan letupan dalam dialek Melayu Proto-Negeri Pahang (DMPNP) memaparkan bahawa sistem fonologinya masih mengekalkan enam konsonan letupan utama, iaitu *p, *b, *t, *d, *k, dan *g. Hasil analisis perbandingan antara varian dialek dalam DMPN membuktikan bahawa konsonan letupan ini mempunyai kesepadanan fonologi yang tinggi dengan Malayik Proto (MP), sekali gus memperkukuhkan kekerabatan antara DMPNP dengan MP.

Konsonan *p dalam DMPNP wujud dalam ketiga-tiga posisi (awal, tengah, dan akhir kata). Keadaan ini menunjukkan bahawa MP *p diwarisi secara langsung. Namun, variasi dalam posisi akhir kata menunjukkan bahawa *p mengalami perubahan kepada hentian glotis [ʔ], yang hanya berfungsi sebagai alternasi kepada MP *p (baca: alofon). Fenomena ini sejajar dengan perubahan fonologi dalam beberapa dialek Melayu lain, seperti dialek Kedah dan Pahang, yang turut mengalami realisasi letupan di posisi akhir kata sebagai hentian glotis (Asmah, 2015; Muhammad Norsyafiq et al., 2023). Perubahan serupa juga berlaku pada DMPNP *-t dan *-k.

Konsonan *k dalam DMPNP mengalami pola perubahan yang serupa dengan *p dan *t, di mana ia kekal dalam posisi awal dan tengah kata tetapi direalisasikan sebagai hentian glotis [ʔ] dalam posisi akhir kata. Contoh perubahan seperti MP *gəmuk > [gəmuʔ; gəmɔʔ] dan MP menunjukkan bahawa proses pengguguran letupan ini berlaku secara sistematik dalam DMPNP yang menyerupai dengan koresponden MP seperi Serawai dan Iban (Adelaar, 1992, hal. 62)[3]. Untuk menyatakan bahawa DMPNP memiliki keterkaitan dengan Serawai dan Iban, perbahasan lanjutan perlu dilaksanakan bagi membuktikan hujah berkenaan.[4]

Perubahan fonologi yang melibatkan konsonan *p, *t dan *k kepada hentian glotis [ʔ] dapat dijelaskan melalui proses debukalisasi. Dalam proses ini, kaedah artikulasi segmen asal dikekalkan, manakala daerah artikulasinya dihilangkan dan digantikan dengan hentian glotis. Oleh sebab hentian glotis [ʔ] juga merupakan bunyi letupan, perubahan *p, *t dan *k kepada [ʔ] hanya melibatkan perubahan pada daerah artikulasi, manakala kaedah artikulasi letupan dikekalkan.

[3] Serawai dan Iban merupakan koresponden Malayik Purba yang merealisasikan hentian glotis [ʔ] pada posisi akhir kata manakala koresponden lain seperti Melayu, Jakarta, Minangkabau, Bengkahulu dan sebagainya merealisasikan Serawai & Iban [-ʔ] sebagai [-k].

[4] Adelaar (1992) menggunakan data-data daripada kamus yang telah dirumikan sebagai bahan rujukannya untuk membuktikan kewujudan konsonan-konsonan ini dalam bahasa-bahasa koresponden. Antara rujukan beliau adalah daripada kamus Wilkinson (1932). Rujukan bertulis ini telah disusun dengan penyesuaian Jawi kepada tulisan Rumi dan ketepatan transliterasi ini membuka ruang kepada perbahasan lanjut. Realisasi [k] dalam bentuk yang tidak dilepaskan (*unrelease*) menyebabkan ia disalah erti sebagai bentuk [k] sedangkan ia wujud dalam bentuk [ʔ] (Deterding et al., 2022, hal. 30). Disebabkan itu, Bahasa Melayu dan juga turunannya telah diklasifikasikan oleh Adelaar (1992) sebagai Bahasa yang merealisasikan [-ʔ] sebagai [-k].

Sebaliknya, konsonan sengauan bukan sasaran langsung proses ini kerana tergolong dalam kelas sonoran dan mempunyai ciri [+sonoran], berbeza daripada konsonan obstruen. Oleh itu, ketiadaan perubahan konsonan sengauan kepada [ʔ] dalam DMPNP berkaitan dengan perbezaan kelas fonologi antara obstruen dan sengauan. Data daripada beberapa dialek Melayu di Pantai Timur turut menyokong generalisasi ini kerana tiada perubahan konsonan sengauan kepada [ʔ] dilaporkan (Zaidi et al., 2021; Hasrah et al., 2014). Walau bagaimanapun, konsonan sengauan tetap mengalami perubahan fonologi, tetapi kesannya diserap oleh vokal yang mendahuluinya. Sebagai contoh, dalam rangkap /a + nasal#/, perubahan tersebut menghasilkan vokal [ɛ].

Bagi konsonan letupan bersuara *b, *d, dan *g, kehadiran fonem-fonem ini hanya dalam posisi awal dan tengah kata membuktikan kestabilannya dalam sistem fonologi DMPNP. Fenomena ini menunjukkan bahawa inovasi fonologi tidak berlaku secara ketara terhadap fonem ini. Oleh kerana bahasa Melayu, sebagai induk kepada dialek ini, memiliki ciri [+bersuara, +letupan, dua bibir/gigi-gusi/lelangit lembut, -posisi akhir] (Deterding et al., 2022), ciri ini turut diserap dalam sistem fonologi DMPNP. Oleh itu, MP *b diwarisi dalam dua posisi sebagaimana yang direkonstruksi oleh Adelaar (1992).

Selain itu, konsonan nasal MP *m dan *n mengalami inovasi yang ketara dalam DMPNP. Ketidakhadiran kedua-dua fonem ini dalam posisi koda menunjukkan inovasi yang mirip dengan bentuk dialek Melayu Pahang purba (Mohd Tarmizi et al., 2014; Muhammad Norsyafiq et al., 2021, 2023). Namun, perbezaan utama antara DMPNP dan dialek Melayu Pahang purba terletak pada MP *ŋ. Dalam DMPNP, MP *ŋ hadir dalam semua posisi kata, manakala dalam dialek Pahang purba, fonem ini tidak wujud.[5]

Konsonan geseran dalam DMPNP terdiri daripada *s, *ɣ, dan *h, masing-masing memiliki keterbatasan penyebaran dalam kata. Sebagai contoh, *s stabil dalam posisi awal dan tengah kata, tetapi /h/ muncul sebagai alofon. Fenomena perubahan MP *r > DMPNP *ɣ pula menunjukkan inovasi ketara yang melibatkan semua posisi dalam kata. Walaupun MP *r tersebar dalam semua posisi kata, dalam DMPNP, *ɣ hanya hadir dalam posisi awal dan tengah kata.

Ciri penyebaran DMPNP *h pula menyerupai penyebaran dialek Melayu Sungai Pahang, di mana ia hanya muncul dalam posisi tengah dan akhir kata (Mohd Tarmizi et al., 2014; Muhammad Norsyafiq et al., 2021, 2023). Ketiadaan MP *h dalam posisi awal kata mungkin menjadi petunjuk bahawa DMPNP tidak menyerap ciri konsonan beraspirasi yang dibawa oleh keluarga bahasa Tai-Kadai. Namun, penyelidikan lanjut diperlukan untuk mengesahkan hipotesis MP *h- > DMPNP ø, memandangkan variasi rangkap vokal yang wujud dalam data.

[5] Ketiadaan unsur nasal pada posisi akhir kata dalam varian di sepanjang Sungai Pahang merupakan ciri yang paling menyerlah dalam dialek purba ini. Inovasi yang ditemui ini merupakan inovasi Bersama yakni majoriti varian yang diuji memiliki ciri kebersamaan.

Seterusnya, DMPNP memiliki dua fonem letusan, iaitu *ʧ dan*ʤ, yang diwarisi secara langsung daripada MP. Kedua-dua fonem ini berkongsi ciri penyebaran yang serupa, iaitu hanya hadir pada posisi awal dan tengah kata. Keadaan yang sama turut berlaku pada fonem sisian *l yang diturunkan secara teratur daripada MP dalam posisi awal dan tengah kata.

Akhir sekali, DMPNP memiliki dua fonem separuh vokal, iaitu *w dan *j, yang diwarisi secara langsung daripada MP. Kedua-dua fonem ini berkongsi ciri penyebaran yang serupa, iaitu hanya hadir dalam posisi tengah kata. Secara ringkas, DMPNP memperlihatkan inovasi fonologi yang ketara berbanding MP, terutamanya dalam aspek perubahan konsonan pada posisi akhir kata. Walaupun begitu, terdapat juga fonem-fonem yang menunjukkan kestabilan dalam sistem fonologi DMPNP, mencerminkan kesinambungan langsung daripada MP.

Berdasarkan perbincangan yang telah dikemukakan, dapat dirumuskan bahawa Dialek Melayu Patani Narathiwat memiliki 18 fonem konsonan. Dapatan ini menunjukkan sedikit perbezaan berbanding dengan dapatan Suraiya (2020), yang berpendapat bahawa Dialek Melayu Patani secara umum memiliki 12 fonem vokal dan 28 fonem konsonan.

Transisi Ciri Fonologi Keluarga Tai-Kadai dalam Varian DMPNP

Sudah menjadi pengetahuan umum dalam bidang linguistik bahawa keluarga bahasa Tai-Kadai mempunyai realisasi letupan dan letusan beraspirasi (Tingsabadh & Abramson, 1993). Tiga konsonan yang dimaksudkan antaranya adalah seperti /p^h/, /t^h/, /k^h/ dan /$ʧ^h$/. Disebabkan dasar asimilasi kerajaan Thailand, fenomena ini telah menyerlahkan unsur-unsur fonologi Tai-Kadai ke dalam sistem fonologi varian DMPNP, khususnya BNL dan AKB. Kehadiran bunyi beraspirasi dalam BNL dan AKB menjadi bukti jelas bahawa varian dialek Melayu Patani Narathiwat sedang mengalami perubahan fonologi ke arah ciri-ciri yang lebih mirip dengan keluarga bahasa tersebut. Situasi ini menguatkan bukti bahawa dialek ini kini dalam proses menyerapi ciri-ciri Tai-Kadai secara beransur-ansur.

Meskipun tanda-tanda ke arah asimilasi keluarga bahasa Tai-Kadai kian menyerlah, namun BNL dan AKB masih dalam fasa transisi yang belum matang sepenuhnya. Wujud beberapa leksikal yang dipungut di lapangan (Jadual 5, Jadual 8, dan Jadual 19) masih mengekalkan ciri [-aspirasi]. Bahkan, varian AKB tidak menunjukkan penandaan jelas terhadap satu lagi fonem utama dalam keluarga bahasa Tai-Kadai, iaitu /t^h/ (Jadual 7).

Tidak mustahil bahawa fenomena asimilasi secara berperingkat ini berkemungkinan berlanjutan seiring dengan keterdesakan masyarakat Melayu untuk ‘menguruskan’ ekonomi mereka selain pertembungan interaksi bersama masyarakat Tai-Kadai di wilayah sekitarnya. Sekiranya proses ini berterusan tanpa sebarang usaha pemuliharaan yang bersistematik, perubahan fonologi akan menjadi lebih ketara, bukan

hanya dalam varian BNL dan AKB, tetapi juga dalam varian lain dialek Melayu Patani-Narathiwat. Dalam jangka panjang, keadaan ini berpotensi menyebabkan penyusutan ciri fonologi asal, sekali gus mengubah landskap linguistik dialek tersebut.

KESIMPULAN

Kajian ini bertujuan untuk merekonstruksi fonem konsonan dalam dialek Melayu Patani Narathiwat purba (DMPNP) dengan menggunakan pendekatan kualitatif. Lokasi kajian melibatkan enam kawasan di Narathiwat, iaitu Kresor, Buketa, Puyok, Munok, Benae Luwas, dan Aikubu. Melalui penerapan teori Rekonstruksi, analisis fonem konsonan yang diperoleh merangkumi pelbagai kategori, termasuk fonem letupan, sengauan, geseran, letusan, sisian, dan separuh vokal. Hasil kajian menyoroti perbezaan dan persamaan dalam ciri fonologi DMPNP berbanding dengan Malayik Purba (MP), serta pengaruh bahasa Tai-Kadai yang dapat dijejak dalam varian DMPNP. Sebagai cadangan untuk penelitian lanjutan, peneliti disarankan untuk memberi fokus kepada pembentukan semula sistem vokal dan diftong DMPNP untuk memberikan gambaran yang lebih jelas tentang hubungan antara MP dan DMPNP, serta membentuk pengklasifikasian varian yang lebih terperinci.

CADANGAN KAJIAN PADA MASA AKAN DATANG

Penelitian di peringkat permulaan sebegini masih memerlukan tindakan lanjutan dan kesegeraan daripada penyelidik bidang bahasa. Hal ini demikian kerana, dialek Melayu Patani Narathiwat merupakan sebuah bahasa yang duduk di sebuah negara yang menjadikan bahasa Thai sebagai bahasa perhubungan dan pengantaraan dalam sekolah-sekolah kerajaan (Phaosan & Mahamatsakree, 2019; Munirah, 2018). Ia merupakan cabaran bagi penyelidik kerana penguasaan dialek Patani Narathiwat asli akan kian menipis kerana intervensi kerajaan Thailand. Munirah (2018) menanggapi bahawa masyarakat Melayu Patani berdepan dengan dilema dari sudut sosioekonomi di mana penggunaan bahasa Melayu tidak begitu dominan dalam sektor pekerjaan menyebabkan asimilasi bahasa dimulakan sejak daripada bangku sekolah bagi membolehkan mereka menghadapi cabaran dari sudut ekonomi. Bagi memastikan cabaran ini dapat diatasi, maka kajian mencadangkan tiga kerangka penelitian.

Pertama, penyelidikan lanjutan harus menumpukan kepada pembentukan semula vokal purba dialek Melayu Patani Narathiwat. Penelitian vokal agak berbeza dengan penelitian konsonan semata-mata. Seperti kebanyakan kajian dialek Melayu, bunyi [e] dan [ɛ] boleh diklasifikasikan sebagai dua bunyi daripada satu sumber iaitu [e] (Muhammad Norsyafiq et al., 2021; Nur Habibah et al., 2023), contohnya. Namun, dalam penelitian lain, ada sarjana yang membuktikan [e] dan [ɛ] bersumberkan kepada [i] (Mohd Tarmizi et al., 2014). Oleh yang demikian, penelitian terhadap vokal purba perlukan kepada isu dan penulisannya yang tersendiri kerana kompleksiti yang didatangkan bersamanya.

Kedua, penyelidik juga harus memberikan penekanan kepada kekangan fonotaktik yang mungkin mempengaruhi kehadiran vokal-vokal dalam posisi dalam katanya. Unsur-unsur harmoni vokal dan penyesuaian dengan vokal hadapan memberi kesan kepada vokal yang berada pada posisi tengah suku kata akhir. Kajian Mohd Tarmizi et al. (2014) memberikan penekanan kepada variasi harmoni vokal yang mungkin dipengaruhi atau mempengaruhi vokal-vokal yang wujud dalam satu-satu leksikal. Sebagai contoh, kata 'gulung' yang lazimnya akan direalisasikan sebagai [guloŋ] mempunyai bunyi [o] pada posisi tengah suku kata akhir yang boleh diklasifikasikan sebagai alternasi daripada [u]. Rumusan akan kelainan vokal pada posisi akhir kata dan dapat memberikan justifikasi akan perekonstruksian yang akan dilaksanakan. Tujuan rangkap vokal ini diberikan perhatian sewajarnya agar penyelidik dapat merekonstruksi leksikal purba dengan lebih tepat.

Ketiga, penyelidik juga perlu merekonstruksi leksikon purba berdasarkan fonem-fonem purba yang telah berjaya dibina semula. Proses pendokumentasian dan penapisan leksikon 'asal' dialek Melayu Patani Narathiwat berupaya memberikan gambaran tentang perkataan-perkataan yang secara hipotesisnya wujud berdasarkan bukti perkongsian ciri antara varian-varian yang dikaji. Dalam konteks ini, pembangunan kamus dialek menjadi salah satu pencapaian penting yang mampu melengkapkan penyelidikan linguistik bandingan. Mengambil inspirasi daripada usaha Blust, Trussel & Smith (2023) dalam penyusunan kamus bahasa purba, kajian linguistik bandingan dapat dimajukan lebih jauh melalui pembinaan data raya yang bermanfaat untuk pelbagai disiplin berkaitan. Data yang diperoleh bukan sahaja memberikan impak yang signifikan dalam bidang etimologi dan leksikografi, malah memberi sumbangan yang lebih besar kepada linguistik sejarawi dalam usaha memahami evolusi bahasa.

Rangkaian bahasa Austronesia dan subkelompok bahasa di bawahnya terus menjadi bidang penyelidikan yang giat dikaji saban tahun. Dalam konteks ini, subkelompok bahasa yang lebih kecil, khususnya melibatkan tiga wilayah di selatan Thailand (Pattani, Yala, dan Narathiwat), juga perlu diberi perhatian dalam menganalisis ciri fonologi dialek proto serta hubungan kekerabatan antara bahasa yang berkaitan. Oleh itu, kajian lanjut perlu dijalankan terhadap sistem vokal (termasuk diftong), kekangan fonotaktik, serta perekonstruksian leksikal purba bagi memperjelaskan dengan lebih menyeluruh susur galur bahasa Melayu dan dialeknya.

PENGHARGAAN

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RUJUKAN

Abdonloh, K., Hishamudin, I., & Mashetoh, A. M. (2022). Pemugaran perubahan makna kata pinjaman bahasa Thai dalam dialek Melayu Patani. *Jurnal Pengajian Melayu - JOMAS, 33*(1), 1-16. https://doi.org/10.22452/JOMAS.vol33no1.1

Adelaar, K. A. (1992). Proto-Malayic: *The reconstruction of its phonology and parts of its lexicon and morphology*. Pacific Linguistics.

Allen, H. B. (1971). Principles of informant selection. *American Speech, 46*(1-2), 47. https://doi.org/10.2307/3087986

Angsana, S., & Ilangko, S. (2021). Consonant changes in words borrowed from Sanskrit to Thai and Patani Malay. *International Journal of Linguistics, 13*(5), 92-102. https://doi.org/10.5296/ijl.v13i5.18957

Asmah, O. (2015). *Kaedah penyelidikan bahasa di lapangan* (Edisi ke-2). Dewan Bahasa dan Pustaka.

Ayatrohaedi. (1979). *Dialektologi: Sebuah pengantar*. Pusat Pembinaan dan Pengembangan Bahasa, Departemen Pendidikan dan Kebudayaan.

Blust, R., Trussel, S., & Smith, A. D. (2023). *Austronesian comparative dictionary*. Zenodo. https://doi.org/10.5281/zenodo.7741197

Chambers, J. K., & Trudgill, P. (1998). *Dialektologi* (A. Ayub, Trans.). Dewan Bahasa dan Pustaka.

Crowley, T., & Bowern, C. (2010). *An introduction to historical linguistics* (4th ed.). Oxford University Press.

Deterding, D., Gardiner, I. A., & Noorashid, N. (2022). *The phonetics of Malay*. Cambridge University Press. https://doi.org/10.1017/9781108942836

Geoffrey, B. (2012). The Aslian languages of Malaysia and Thailand: An assessment. *Language Documentation and Description, 11*, 136-230.

Hervey, D. F. A. (1881). The Endau and its tributaries. *Journal of the Straits Branch of the Royal Asiatic Society,* (7), 93-132.

Ibrohim, M. (2016). *Pemetaan dialek geografi varian Yaha* [Unpublished master's thesis]. Universiti Kebangsaan Malaysia.

Ibrohim, M. (2023). Penyebaran sistem vokal DMP di Yaha. *RENTAS: Jurnal Bahasa, Sastera dan Budaya, 2*, 267-287. https://doi.org/10.32890/rentas2023.2.12

Iskandar, C. (1976). *Orang Asli: The aboriginal tribes of Peninsular Malaysia*. Oxford University Press.

Linn, M. D. (1983). Informant selection in dialectology. *American Speech, 58*(3), 225-243. https://doi.org/10.2307/455229

Mahsun. (2005). *Metode penelitian bahasa: Tahapan strategi, metode, dan tekniknya*. Rajagrafindo Persada.

Mohd Tarmizi, H., Rahim, A., & Shahidi, A. H. (2014). *Fosil dialek Melayu Hulu Pahang*. Penerbit Universiti Kebangsaan Malaysia.

Muhammad Norsyafiq, Z., Rahim, A., & Shahidi, A. H. (2021). *Genetik purba dialek Melayu: Di lembangan tengah Sungai Pahang*. Penerbit Universiti Kebangsaan Malaysia.

Muhammad Norsyafiq, Z., Rahim, A., & Shahidi, A. H. (2023). Reconstruction of proto central of Pahang River phoneme. *Pertanika Journal of Social Sciences & Humanities, 31*(1), 361-382. https://doi.org/10.47836/pjssh.31.1.19

Munirah, Y. (2018). Preserving ethnic identity through native language and religion: A case study of the Malay-Muslims in southern Thailand. *Global Journal Al Thaqafah, 8*(1), 57-71. https://doi.org/10.7187/GJAT072018-5

Nanthawan, P. (1978). *Panha Chao Thai Muslim nai si changwat Phak Tai (Masalah masyarakat Thai Muslim di empat wilayah selatan)*. Persatuan Sains Sosial Thailand.

Nik Anuar, N. M. (2006). *Sejarah perjuangan Melayu Patani 1785-1954*. Penerbit Universiti Kebangsaan Malaysia.

Nur Habibah, C. R., Rahim, A., & Shahidi, A. H. (2023). *Dialek Hulu Perak Utara: Pendekatan linguistik perbandingan*. Penerbit Universiti Kebangsaan Malaysia.

Paitoon, M. C. (2005). Transmorfofonologisasi suprafiks: Dialek Patani merentasi zaman. *Jurnal Bahasa, 5*(1), 51-67.

Phaosan, J., & Mahamatsakree, M. (2019). Problems of Malay language education in Patani southern Thailand. *In Proceedings of the 1st EAI Bukittinggi International Conference on Education (BICED 2019), 17-18 October 2019, Bukittinggi, West Sumatera, Indonesia*. https://doi.org/10.4108/eai.17-10-2019.2289738

Rahim, A. (2017). *Linguistik bandingan bahasa Bidayuhik*. Penerbit Universiti Kebangsaan Malaysia.

Rahim, A., Deela, S., & Shahidi, A. H. (2021). *Dialek geografi Melayu Patani varian Waeng*. Penerbit Universiti Kebangsaan Malaysia.

Ruslan, U. (2011). *Keistimewaan dialek Melayu Patani*. Penerbit Universiti Kebangsaan Malaysia.

Sareeyah, S. (2016). *Fonologi bahasa Melayu Patani varian Yala: Kajian kes di Kampung Saga dan Tannyung* [Unpublished master's thesis]. Universiti Kebangsaan Malaysia.

Shahidi, A. H., & Mumad, C. (2020). Pemanjangan konsonan dalam dialek Melayu Patani. *GEMA Online® Journal of Language Studies, 20*(3), 181-198. https://doi.org/10.17576/gema-2020-2003-11

Sturrock, A. J. (1912). Some notes on the Kelantan dialect, and some comparisons with the dialects of Perak and Central Pahang. *Journal of the Straits Branch of the Royal Asiatic Society,* (62), 1-7.

Suraiya, C. (2020). The phonological of Patani Malay dialect: An analysis of Autosegmental theory. *Indonesian Journal of Education, Social Sciences and Research (IJESSR), 1*(2), 71-78.

Tingsabadh, M. R. K., & Abramson, A. S. (1993). Thai. *Journal of the International Phonetic Association, 23*(1), 24-28. https://doi.org/10.1017/S0025100300004746

Wilkinson, R. J. (1932). *A Malay-English dictionary: Romanised*. Salavopoulos and Kinderlis.

Worawit, B. (1990). *Pengaruh bahasa Thai ke atas dialek Melayu Patani: Kajian kes sosiolinguistik di wilayah Pattani* [Unpublished master's thesis]. Universiti Malaya.

Worawit, B. (1999). *Dasar kerajaan dan kesannya terhadap bahasa Melayu di negara Thai* [Unpublished doctoral dissertation]. Universiti Malaya.

Zulkifley, H., & Pareeda, H. (2015). Melayu di sempadan: Penghilangan konsonan obstruent-homorganik dalam dialek Melayu Patani. *Geografia-Malaysian Journal of Society and Space, 11*(3), 28-41.

LAMPIRAN

Daftar Kata Varian Dialek Melayu Patani Narathiwat (DMPN)

Bil.	Erti Kata	Sungai Padi		Sungai Kolok		Waeng	
		AKB	BNL	MNK	PYK	BKT	KRS
1	pagi	pagiʲ	pagiʲ	pagiʲ	pagiʲ	pagiʲ	pagiʲ
2	petang	pətɛ	pətɛ	pətɛ	pətɛ	pətɛ	pətɛ
3	esok	isɔʔ	isɔʔ	ɛsɔʔ	ɛsɔʔ	ɛsɔʔ	ɛsɔʔ
4	lusa	lusɔ	lusɔ	lusɔ	lusɔ	lusɔ	lusɔ
5	bulan	bulɛ	bulɛ	bulɛ	bulɛ	bulɛ	bulɛ
6	tahun	tahaᵘŋ	tʰahoŋ	taoŋ	tahoŋ	taoŋ	tahoŋ
7	satu	sɔ	sɔ	satuʷ	sɔ	satuʷ	sɔ
8	dua	duwɔ	duwɔ	duʷɔ	duwɔ	duʷɔ	duwɔ
9	tiga	tigɔ	tigɔ	tigɔ	tigɔ	tigɔ	tigɔ
10	empat	paʔ	paʔ	paʔ	paʔ	paʔ	paʔ
11	lima	limɔ	limɔ	limɔ	limɔ	limɔ	limɔ
12	enam	nɛ	nɛ	nɛ	nɛ	nɛ	nɛ
13	tujuh	tudʒoh	tudʒoh	tudʒoh	tudʒoh	tudʒoh	tudʒoh
14	lapan	lapɛ	lapɛ	lapɛ	lapɛ	lapɛ	lapɛ
15	sembilan	mːilɛ	mːilɛ	sˢmilɛ	mːilɛ	sˢmilɛ	mːilɛ
16	sepuluh	pːuloh	pːuloh	sˢpuloh	pːuloh	sˢpuloh	pːuloh
17	ipar	ipa	ipa	ipa	ipa	ipa	ipa
18	cucu	ʧuʧuʷ	ʧuʧuʷ	ʧuʧuʷ	ʧuʧuʷ	ʧuʧuʷ	ʧuʧuʷ
19	perempuan	tːinɔ	tːinɔ	tːinɔ	tːinɔ	tːinɔ	tːinɔ
20	suami	toʔ lːakiʲ	toʔ lːakiʲ	toʔ lːakiʲ	toʔ lːakiʲ	toʔ lːakiʲ	toʔ lːakiʲ
21	isteri	biniŋ	biniŋ	biniʲ	biniŋ	biniʲ	biniŋ
22	bapa	abɔh	ʧeʔ	ʧeʔ	ajɔh	wɛ	ajɔh
23	ibu	mɛʔ	mɛʔ	mɔʔ	mɔʔ	mɛʔ	mɔʔ

Bil.	Erti Kata	Sungai Padi		Sungai Kolok		Waeng	
		AKB	BNL	MNK	PYK	BKT	KRS
24	datuk	ʧeʔ	ʧeʔ wɔ	ʧɛʔ wɔ	ʧɛʔ wɔ	ʧʰɛ	tɔʔ ʧʰɛ
25	nenek	mɔʔ	mɔʔ wɔ	wɔ	mɔʔ wɔ	toʔ	toʔ
26	abang	kakɔʔ jatɛ	kakɔʔ jatɛ	abɛ	kakɔʔ jatɛ	abɛ	kakɔʔ ʤatɛ
27	kakak	kakɔʔ t:inɔ	kakɔʔ t:inɔ	kakɔʔ	kakɔʔ t:inɔ	kakɔʔ	kakɔʔ t:inɔ
28	anak	anɔʔ	anɔʔ	anɔʔ	anɔʔ	anɔʔ	anɔʔ
29	adik	adeʔ	adeʔ	adeʔ	adeʔ	adeʔ	adeʔ
30	sepupu	p:upuʷ	p:upuʷ	sˢpupuʷ	p:upuʷ	sˢpupuʷ	p:upuʷ
31	saya	kitɔ	kitɔ	kawɛ	kawɛ	kitɔ	kumɔ
32	kamu	diʲɔ	dɛmɔ	dɛmɔ	dɛmɔ	diʲɔ	dɛmɔ
33	siapa	pʰijɔ	pʰijɔ	sapɔ	pijɔ	pijɔ	pʰɔdiʲɔ
34	tanya	taɲɔ	taɲɔ	taɲɔ	taɲɔ	taɲɔ	taɲɔ
35	nganga	ŋaŋɔ	ŋaŋɔ	ŋaŋɔ	ŋaŋɔ	ŋaŋɔ	ŋaŋɔ
36	dahan	dahɛ	dahɛ	dɛhɛ	dɛhɛ	dɛhɛ	dɛhɛ
37	pasir	pase	pase	pase	pase	pase	pase
38	awan	awɛ	awɛ	awɛ	awɛ	awɛ	awɛ
39	panas	panah	panah	panah	panah	panah	panah
40	beras	bɔɣah	bɔɣah	bɔɣah	bɔɣah	bɔɣah	bɔɣah
41	laut	ai laoʔ	ai laoʔ	ae laoʔ	laoʔ	ae laoʔ	laoʔ
42	langit	laŋiʔ	laŋiʔ	laŋiʔ	laŋiʔ	laŋiʔ	laŋiʔ
43	sempit	sɔpeʔ	sɔpeʔ	sɔpeʔ	sɔpeʔ	sɔpeʔ	sɔpeʔ
44	sakit	sakeʔ	sakeʔ	sakeʔ	sakeʔ	sakeʔ	sakeʔ
45	bulan	bulɛ	bulɛ	bulɛ	bulɛ	bulɛ	bulɛ
46	bintang	bitɛ	bitɛ	bitɛ	bitɛ	bitɛ	bitɛ
47	bukit	bukeʔ	bukeʔ	bukeʔ	bukeʔ	bukeʔ	bukeʔ
48	sungai	suŋa	suŋa	suŋa	suŋa	suŋa	suŋa
49	tanah	tanɔh	tanɔh	tanɔh	tanɔh	tanɔh	tanɔh
50	batu	batuʷ	batuʷ	batuʷ	batuʷ	batuʷ	batuʷ

Bil.	Erti Kata	Sungai Padi		Sungai Kolok		Waeng	
		AKB	BNL	MNK	PYK	BKT	KRS
51	kayu	kaju^{w}	kaju^{w}	kaju^{w}	kaju^{w}	kaju^{w}	kaju^{w}
52	air	ai	ae	a:e	ae	a:e	ae
53	pokok	paha^{u}ŋ	pahoŋ	pɔhoŋ	pɔhoŋ	pɔhoŋ	pɔhɔŋ
54	akar	aka	aka	aka	aka	aka	aka
55	daun	daoŋ	daoŋ	dauŋ	dauŋ	dauŋ	dauŋ
56	semak	ɣɔʔ	ɣɔʔ	sɘmɔʔ	ɣɔʔ	sɘmɔʔ	ɣɔʔ
57	rumput	ɣɘpuʔ	upuʔ	ɣupuʔ	ɣupuʔ	ɣupuʔ	upuʔ
58	lumpur	sɘluʔ	sɘluʔ	sɘluʔ	sɘluʔ	sɘluʔ	sɘluʔ
59	angin	aŋiŋ	aŋiŋ	aŋiŋ	aŋiŋ	aŋiŋ	aŋiŋ
60	banjir	ai bɔh	s:ɘlɛ ai	baɲ^{dʒ}e	bɔh	bɔh	bɔh
61	hujan	udʒɛ	udʒɛ	hudʒɛ	hudʒɛ	hudʒɛ	hudʒɛ
62	guruh	guɣoh	guɣoh	guɣoh	guɣoh	guɣoh	guɣoh
63	kilat	kilaʔ	p^{ə}laka	kilaʔ	p^{ə}laka	kilaʔ	m:anɔh
64	ayam	hajɛ	hajɛ	ajɛ	hajɛ	ajɛ	hajɛ
65	udang	hudɛ	hudɛ	udɛ	hudɛ	udɛ	hudɛ
66	sotong	sutoŋ	sutoŋ	sutoŋ	sutoŋ	sutoŋ	sutoŋ
67	siput	kɘʧa	kɘʧa	sipuʔ	sipuʔ	sipuʔ	sipuʔ
68	ikan	ikɛ	ikɛ	ikɛ	ikɛ	ikɛ	ikɛ
69	durian	d:ijɛ	d:ujɛ	d^{ə}ɣijɛ	d^{ə}ɣijɛ	d^{ə}ɣijɛ	d:ijɛ
70	rambutan	mɔʔtɛ	mɔʔtɛ	mɔʔtɛ	mɔʔtɛ	mɔʔtɛ	mɔʔtɛ
71	pisang	pisɛ	pisɛ	pisɛ	pisɛ	pisɛ	pisɛ
72	kelapa	ɲɔ	ɲɔ	ɲɔ	ɲɔ	ɲɔ	ɲɔ
73	betik	bɘteʔ	bɘteʔ	bɘteʔ	bɘteʔ	bɘteʔ	bɘteʔ
74	cempedak	p:ɘdɔʔ	p:ɘdɔʔ	ʧɘpɘdɔʔ	p:ɘdɔʔ	ʧɘpɘdɔʔ	p:ɘdɔʔ
75	jagung	jagoŋ	jagoŋ	ʤagoŋ	ʤagoŋ	ʤagoŋ	ʤagoŋ
76	nenas	lanah	lanah	lanah	lanah	lanah	lanah
77	limau	asɛ lima	asɛ lima nipih	asɛ lima nipih	asɛ lima	lima nipih	asɛ lima

Bil.	Erti Kata	Sungai Padi		Sungai Kolok		Waeng	
		AKB	BNL	MNK	PYK	BKT	KRS
78	serai	səɣa	səɣa	səɣa	səɣa	səɣa	səɣa
79	petai	pəta	pəta	pəta	pəta	pəta	pəta
80	jering	jəɣiŋ	jəɣiŋ	ʤəɣiŋ	ʤəɣiŋ	ʤəɣiŋ	ʤəɣiŋ
81	kunyit	kuɲiʔ	kuɲiʔ	kuɲiʔ	kuɲiʔ	kuɲiʔ	kuɲiʔ
82	bawang	bawɛ	bawɛ	bawɛ	bawɛ	bawɛ	bawɛ
83	telur	təlɔ	təlɔ	təlɔ	təlɔ	təlɔ	təlɔ
84	nasi	nasiʔ	nasiʔ	nasiʔ	nasiʔ	nasiʔ	nasiʔ
85	nipis	nipih	nipih	nipih	nipih	nipih	nipih
86	garam	gaɣɛ	gaɣɛ	gaɣɛ	gaɣɛ	gaɣɛ	gaɣɛ
87	gula	saka	gulɔ	gulɔ	gulɔ	gulɔ	gulɔ
88	susu	tusu	tusu	susu	tusu	tusu	tusu
89	minyak	miɲɔʔ	miɲɔʔ	miɲɔʔ	miɲɔʔ	miɲɔʔ	miɲɔʔ
90	timun	timuŋ batɛ	timuŋ batɛ	timuŋ batɛ	timuŋ batɛ	timuŋ batɛ	timuŋ batɛ
91	tauge	katʃɛ ʧamə h	katʃɛ ʧamᵇɔh	katʃɛ ʧabuʔ	katʃɛ ʧabuʔ	katʃɛ tɔgɛ	katʃɛ ʧamᵇɔh
92	sawi	ləbɔʔ	ləbɔʔ	ləbɔʔ	ləbɔʔ	ləbɔʔ	ləbɔʔ
93	petola	tːɛnɛ	tːɛnɛ	tːɛnɛ	tːɛnɛ	tːɛnɛ	tːɛnɛ
94	peria	fːijɔ	fːijɔ	pᵊɣijɔ	pʰəɣijɔ	pujɔ	pːujɔ
95	ubi	hubi	hubi	ubi	hubi	ubi	hubi
96	berjalan	ʤːalɛ	ʤːalɛ	ʤːalɛ	ʤːalɛ	ʤːalɛ	ʤːalɛ
97	kait	gahaᵉʔ	gaheʔ	kaheʔ	kaheʔ	kaheʔ	gaheʔ
98	keluar	tubeʔ	tubeʔ	tubeʔ	tubeʔ	tubeʔ	tubeʔ
99	ikat	ikaʔ	ikaʔ	ikaʔ	ikaʔ	ikaʔ	ikaʔ
100	tali	taliʲ	taliʲ	taliʲ	taliʲ	taliʲ	taliʲ
101	tidur	tido	tido	tido	tido	tido	tido
102	berenang	wːənɛ	wːunɛ	bᵊɣənɛ	bᵊɣənɛ	bᵊɣənɛ	bᵊɣənɛ
103	mencuri	ʧʰuɣi	ʧʰuɣi	ʧuɣi	ʧʰuɣi	ʧuɣi	ʧʰuɣi
104	tarik	hiɣɛʔ	ɛɣɛʔ	hɛɣɛʔ	hɛɣɛʔ	hɛɣɛʔ	hɛɣɛʔ

Bil.	Erti Kata	Sungai Padi		Sungai Kolok		Waeng	
		AKB	BNL	MNK	PYK	BKT	KRS
105	pukul	katɔʔ	katɔʔ	gɔdɛ	tɛ	ɣɔdɛ	tɛ
106	pulang	kʰɔleʔ	kʰɔleʔ	kɔleʔ	kʰɔleʔ	kɔleʔ	kɔleʔ
107	siram	ʤɔɣuh	ʤiɣuh	ʤiɣuh	ʤiɣuh	ʤiɣuh	ʤɔɣuh
108	tidur	tido	tido	tido	tido	tido	tido
109	hidup	idoʔ	idoʔ	hidoʔ	hidoʔ	hidoʔ	hidoʔ
110	sedap	sɔdaʔ	sɔdaʔ	sɔdaʔ	sɔdaʔ	sɔdaʔ	sɔdaʔ
111	mati	matiʲ	matiʲ	matiʲ	matiʲ	matiʲ	matiʲ
112	mati (haiwan)	mapoh	mapoh	mapuh	mapoh	mapoh	mapoh
113	tumpul	tupʰo	tupʰo	tupo	tupo	tupo	tupo
114	simpan	taɣoh	taɣoh	sipɛ	taɣoh	sipɛ	taɣoh
115	turun	tuɣoŋ	tuɣoŋ	tuɣoŋ	tuɣoŋ	tuɣoŋ	tuɣoŋ
116	kanan	kʰanɛ	kʰanɛ	kanɛ	kanɛ	kanɛ	kanɛ
117	kiri	kʰiɣiʲ	kʰiɣiʲ	kiɣiʲ	kiɣiʲ	kiɣiʲ	kiɣiʲ
118	besar	bɔsa	bɔsa	bɔsa	bɔsa	bɔsa	bɔsa
119	minta	mɛtɔʔ	mitɔʔ	mitɔʔ	mitɔʔ	mitɔʔ	mɛtɔʔ
120	muntah	mutɔh	mutɔh	mutɔh	mutɔh	mutɔh	mutɔh
121	pedih	pɔdeh	pɔdeh	pɔdih	pɔdih	pɔdih	pɔdih
122	buka	bukɔʔ	bukɔʔ	bukɔ	bukɔʔ	bukɔ	bukɔʔ
123	tutup	katoʔ	katoʔ	katoʔ	katoʔ	katoʔ	katoʔ
124	angkat	akɛʔ	akɛʔ	akaʔ	akaʔ	akaʔ	akɛʔ
125	ketawa	ŋila	ŋila	sukɔ	ŋila	sukɔ	ŋila
126	makan	makɛ	makɛ	makɛ	makɛ	makɛ	makɛ
127	hisap	isaʔ	isaʔ	hisaʔ	hisaʔ	hisaʔ	hisaʔ
128	tajam	taʤɛ	taʤɛ	taʤɛ	taʤɛ	taʤɛ	taʤɛ
129	lebar	lɛba	lɛba	lɛba	lɛba	lɛba	lɛba
130	cepat	dɔɣah	dɔɣah	ʧɔpaʔ	dɔɣah	baŋaʔ	baŋaʔ
131	lambat	lamaʔ	lamaʔ	lamᵇaʔ	lamᵇaʔ	lamᵇaʔ	lamᵇaʔ

Bil.	Erti Kata	Sungai Padi		Sungai Kolok		Waeng	
		AKB	BNL	MNK	PYK	BKT	KRS
132	marah	muɣeh	muɣeh	maɣɔh	muɣeh	maɣɔh	maɣɔh
133	gemuk	gəmɔʔ	gəmɔʔ	gəmuʔ	gəmuʔ	gəmuʔ	gəmuʔ
134	kering	kʰəɣiŋ	kʰəɣiŋ	kəɣiŋ	kʰəɣiŋ	kəɣiŋ	kʰəɣiŋ
135	kotor	ʧʰəma	ʧʰəma	ʧəma	ʧʰəma	ʧəma	ʧʰəma
136	busuk	busuʕ	busuʕ	busuʔ	busuʕ	busuʔ	busuʕ
137	jarum	jaɣoŋ	jaɣoŋ	ʤaɣoŋ	ʤaɣoŋ	ʤaɣoŋ	ʤaɣoŋ
138	kelat	kʰəlaʔ	kʰəlaʔ	kəlaʔ	kʰəlaʔ	kəlaʔ	kʰəlaʔ
139	manis	manih	manih	manih	manih	manih	manih
140	benci	bəʧʰi	bəʧʰi	bɛʧi	bəʧʰi	bɛʧi	bɛʧʰi
141	tua	tʰuwɔ	tʰuwɔ	tuwɔ	tʰuwɔ	tuwɔ	tʰuwɔ
142	muda	mudɔ	mudɔ	mudɔ	mudɔ	mudɔ	mudɔ
143	penuh	pənɔh	pənɔh	pənuh	pənuh	pənuh	pənuh
144	putih	puteh	puteh	puteh	puteh	puteh	puteh
145	hijau	iʤa	iʤa	hiʤa	hiʤa	hiʤa	hiʤa
146	merah	mɛɣɔh	mɛɣɔh	mɛɣɔh	mɛɣɔh	mɛɣɔh	mɛɣɔh
147	kuning	kuniŋ	kuniŋ	kuniŋ	kuniŋ	kuniŋ	kuniŋ
148	orang	uɣɛ	uɣɛ	ɔɣɛ	ɔɣɛ	ɔɣɛ	ɔɣɛ
149	kulit	kuleʔ	kuleʔ	kuleʔ	kuleʔ	kuleʔ	kuleʔ
150	telinga	l:iŋɔ	l:iŋɔ	tˢliŋɔ	l:iŋɔ	tˢliŋɔ	tˢliŋɔ
151	kepala	p:alɔ	p:alɔ	p:alɔ	p:alɔ	p:alɔ	p:alɔ
152	leher	təkɔʔ	təkɔʔ	təkɔʔ	təkɔʔ	təkɔʔ	təkɔʔ
153	otak	utɔʔ	utɔʔ	ɔtɔʔ	ɔtɔʔ	ɔtɔʔ	ɔtɔʔ
154	jantung	jatoŋ	jatoŋ	ʤatoŋ	jatoŋ	ʤatoŋ	ʤatoŋ
155	uban	hubɛ	hubɛ	ubɛ	hubɛ	ubɛ	hubɛ
156	pusat	pusaʔ	pusaʔ	pusaʔ	pusaʔ	pusaʔ	pusaʔ
157	lengan	ləŋɛ	ləŋɛ	ləŋɛ	ləŋɛ	ləŋɛ	ləŋɛ
158	tangan	taŋɛ	taŋɛ	taŋɛ	taŋɛ	taŋɛ	taŋɛ

Bil.	Erti Kata	Sungai Padi		Sungai Kolok		Waeng	
		AKB	BNL	MNK	PYK	BKT	KRS
159	muka	$muk^hɔ$	$muk^hɔ$	mukɔ	mukɔ	mukɔ	mukɔ
160	lemak	ləməʔ	ləməʔ	ləməʔ	ləməʔ	ləməʔ	ləməʔ
161	mata	matɔ	matɔ	matɔ	matɔ	matɔ	matɔ
162	mulut	muloʔ	muloʔ	muloʔ	muloʔ	muloʔ	muloʔ
163	jari	jaɣiʲ	jaɣiʲ	ʤaɣiʲ	ʤaɣiʲ	ʤaɣiʲ	ʤaɣiʲ
164	kaki	kakiʲ	kakiʲ	kakiʲ	kakiʲ	kakiʲ	kakiʲ
165	dagu	daguʷ	daguʷ	daguʷ	daguʷ	daguʷ	daguʷ
166	gusi	gusiʲ	gusiʲ	gɔsiʲ	gɔsiʲ	gɔsiʲ	gɔsiʲ
167	pipi	pipiʲ	pipiʲ	pipiʲ	pipiʲ	pipiʲ	pipiʲ
168	gigi	gigiʲ	gigiʲ	gigiʲ	gigiʲ	gigiʲ	gigiʲ
169	perut	$p^hɘɣoʔ$	$p^hɘɣoʔ$	pɘɣoʔ	pɘɣoʔ	pɘɣoʔ	pɘɣoʔ
170	siku	sikuʷ	sikuʷ	sikuʷ	sikuʷ	sikuʷ	sikuʷ
171	rusuk	ɣusoʔ	ɣusoʔ	ɣusoʔ	ɣusoʔ	ɣusoʔ	ɣusoʔ
172	urat	uɣaʔ	uɣaʔ	ɔɣaʔ	ɔɣaʔ	ɔɣaʔ	ɔɣɔʔ
173	hidung	idoŋ	idoŋ	hidoŋ	hidoŋ	hidoŋ	hidoŋ
174	rumah	ɣəməh	umɔh	ɣumɔh	ɣumɔh	ɣumɔh	umɔh
175	dapur	dapo	dapo	dapo	dapo	dapo	dapo
176	tiang	$t^hiʲɛ$	$t^hijɛ$	tijɛ	$t^hiʲɛ$	tijɛ	$t^hijɛ$
177	jendela	nːɛlɔ	nːɛlɔ	pitu nːɛlɔ	nːɛlɔ	pitu nːɛlɔ	pitu nːɛlɔ
178	perigi	lːagɔ	lːagɔ	$tᵊlagɔ$	lːagɔ	$tᵊlagɔ$	lːagɔ
179	bantal	bata	bata	bata	bata	bata	bata
180	ubat	obaʔ	ɔbaʔ	ubaʔ	hubaʔ	ubaʔ	hubaʔ
181	cabut	ʧabuʔ	ʧabuʔ	ʧabuʔ	ʧabuʔ	ʧabuʔ	ʧabuʔ
182	semut	sumuʔ	sumuʔ	sumuʔ	sumuʔ	sumuʔ	sumuʔ
183	kambing	kameŋ	kameŋ	$kam^beŋ$	$kam^beŋ$	$kam^beŋ$	$kam^beŋ$
184	lembu	ləmu	ləmu	$ləm^bu$	$ləm^bu$	$ləm^bu$	$ləm^bu$
185	gajah	ɣadʒɔh	ɣadʒɔh	gadʒɔh	gadʒɔh	gadʒɔh	gadʒɔh

Bil.	Erti Kata	Sungai Padi		Sungai Kolok		Waeng	
		AKB	BNL	MNK	PYK	BKT	KRS
186	biri-biri	bːiɣiŋ	bːiɣiŋ	bːiɣiʲ	bːiɣiʲ	bːiɣiʲ	bːiɣiʲ
187	anjing	haɲiŋ	haɲiŋ	aɲiŋ	haɲiŋ	aɲiŋ	haɲiŋ
188	kera	kʰəɣɔ	kʰəɣɔ	kəɣɔ	kʰəɣɔ	kəɣɔ	kʰəɣɔ
189	burung	buɣoŋ	buɣoŋ	buɣoŋ	buɣoŋ	buɣoŋ	buɣoŋ
190	kucing	kuʧiŋ	kuʧiŋ	kuʧiŋ	kuʧiŋ	kuʧiŋ	kuʧiŋ
191	buaya	bɔjɔ	bɔjɔ	bɔjɔ	bɔjɔ	bɔjɔ	bɔjɔ
192	nyamuk	ɲamɔʔ	ɲamɔʔ	ɲamɔʔ	ɲamɔʔ	ɲamɔʔ	ɲamɔʔ
193	nyawa	ɲawɔ̃	ɲawɔ̃	ɲawɔ̃	ɲawɔ̃	ɲawɔ̃	ɲawɔ̃
194	rama-rama	ɣːamɔ	ɣːamɔ	gˤlamɔ	gːamɔ	gˤlamɔ	gˤlamɔ
195	biawak	ʤːɛwɔʔ	bɛwɔʔ	ʤːɛwɔʔ	bɛwɔʔ	bɛwɔʔ	ʤːɛwɔʔ
196	ulat	hulaʔ	hulaʔ	ulaʔ	hulaʔ	ulaʔ	hulaʔ
197	cacing	ʧaʧiŋ	ʧaʧiŋ	ʧaʧiŋ	ʧaʧiŋ	ʧaʧiŋ	ʧaʧiŋ
198	labah-labah	lːabɔ	lːabɔ	lːabɔ	lːabɔ	lːabɔ	lːabɔ
199	cakar	kʰəkɑ̃	kəkɑ̃	ɣukɑ̃	kʰəkɑ̃	kəkɑ̃	kəkɑ̃
200	ekor	ikɔ	ikɔ	ɛkɔ	ɛkɔ	ɛkɔ	ɛkɔ

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Review Article

Neuro-Pedagogical Game-Based Learning for Post-Pandemic Executive Function Recovery: BrainGEM Neuro360

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ABSTRACT

The COVID-19 pandemic severely impacted childhood neurodevelopment, with documented executive function levels among primary-aged children dropping below historical developmental norms. Although Game-Based Learning (GBL) is widely recognised for promoting engagement, educators often lack the neuro-pedagogical insights needed to optimise deep learning and prevent cognitive fatigue. This article introduces and theoretically develops BrainGEM Neuro360, a Malaysian-developed framework to bridge practical educational neuroscience and real classroom practice. A structured integrative review of research from 2019 to 2026 is applied, examining how GBL is theorised to engage prefrontal and frontoparietal neural networks and evaluating the framework's alignment with inquiry-based learning, applying the International Baccalaureate Primary Years Programme (IB PYP) as an illustrative context. The four-phase Neuro-Pedagogical Learning Cycle (NPLC) is proposed as a conceptual model for cognitive recovery, learner autonomy, and metacognitive self-regulation, structured within a strategic management ecosystem theorised to give school leaders a data-informed feedback mechanism, pending empirical testing. BrainGEM Neuro360 is offered as a theoretically derived, scalable, culturally responsive governance model for Malaysian and ASEAN school networks, advancing SDG 4 (Quality Education) and establishing a theoretical baseline for subsequent empirical testing.

Keywords: Cognitive flexibility, educational leadership, gamification, neuroeducation, neuroplasticity, SDG 4, self-regulated learning, working memory

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INTRODUCTION

The COVID-19 pandemic disrupted childhood neurodevelopmental trajectories, leaving young learners with documented

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deficits in executive functions: working memory, inhibitory control, and cognitive flexibility (Chichinina & Gavrilova, 2022; Jones et al., 2026). In response, primary educators have increasingly adopted Game-Based Learning (GBL) as a pedagogical approach supporting children's cognitive, social, emotional, and motivational development (Alotaibi, 2024; Qian & Clark, 2016), consistent with neuroplasticity-based accounts of how structured early-childhood pedagogy restores learning capacity (Goldberg, 2022).

Neuroeducation scholars theorise that prefrontal and frontoparietal mechanisms underlying cognitive control, attentional focus, and spatial planning are engaged by adaptive game-based learning across digital and analogue formats (Bavelier & Green, 2019; Diamond, 2013). AI-enabled personalised educational technology further enables real-time calibration of game-based challenges to each student's cognitive profile (Niyazova et al., 2026), informing subsequent hybrid digital-analogue curricular designs.

This research references the International Baccalaureate Primary Years Programme (IB PYP) as a compatible curriculum context, given its inquiry-based, transdisciplinary, student-centric learning model, though the framework proposed here is a broadly applicable neuro-pedagogical system; the IB PYP is illustrative, not constitutive, of its theoretical applicability.

Malaysia and Southeast Asia's national education policies prioritise digital literacy, higher-order thinking, and regional competitiveness (Ministry of Education Malaysia, 2013, 2022), aligning with Sustainable Development Goal (SDG) 4.1 (equitable foundational learning) and SDG 4.7 (critical thinking and global citizenship; United Nations, 2015). Post-pandemic evidence indicates that digital-analogue game-based interventions re-engage students (Nadeem et al., 2023) and that gamified executive-function training correlates with standardised academic achievement (Eng et al., 2024).

This study conceptualises BrainGEM Neuro360, a framework bridging the historically isolated domains of game design, neuroscience, and school management into one operational standard, grounded in a structured integrative literature review (Snyder, 2019; Torraco, 2005) and intended as a theoretical baseline for subsequent empirical data collection (Jaakkola, 2020). The Neuro-Pedagogical Learning Cycle (NPLC) is the framework's core conceptual model, illustrated through application within the IB PYP context.

Existing frameworks address these domains only in isolation: cognitive-training programmes (Birtwistle et al., 2025) improve executive function but are not embedded in classroom pedagogy or school-management architecture; inquiry-based curricula such as the IB PYP (International Baccalaureate Organization [IBO], 2018) provide pedagogical structure without neurodevelopmental grounding; and school-leadership models (e.g., Fullan, 2014; Spillane, 2006) offer governance architecture while treating the

classroom itself as a black box. BrainGEM Neuro360's specific contribution, the Neuro-Pedagogical Learning Cycle (NPLC), translates neurodevelopmental constructs into classroom-observable pedagogical moves nested inside a school-management architecture, running the same conceptual vocabulary from learner to institution. This integrative connection, rather than any single-domain finding, is the paper's central contribution; RQ1 (the NPLC's neurodevelopmental basis) is accordingly its primary scholarly contribution, with RQ2-RQ4 as applications to curriculum, equity, and leadership.

Problem Statement and Research Gaps

Primary school systems experience a compounding developmental crisis, despite positive empirical data on neuro-pedagogy in digital-analogue game-based learning environments. A study by Jones et al. (2026) shows that the executive functioning (EF) growth among young learners dropped approximately 0.5 standard deviations below historical developmental norms, as evidenced by a longitudinal cohort of 3,107 children aged 3 to 11 with similar patterns across socioeconomic groups. Chichinina and Gavrilova (2022) specifically document smaller gains in working memory and cognitive flexibility among 5- to 6-year-olds during lockdown.

Independent corroboration comes from Wright et al. (2026), who used direct behavioural EF assessment (N = 667) and found 11-12 months of lost growth during closures, with recovery at only 65-74% of the pre-closure rate. The broader evidence base is more mixed, however: a 16-country meta-analysis of 22,348 preschoolers (Alcon et al., 2024) found only small effects, and Rivera-Urbina et al. (2025) found no significant pre–post difference on most adolescent EF measures. This literature is therefore treated as an emerging, still-consolidating evidence base, more consistent for primary-school-aged children (Jones et al., 2026; Wright et al., 2026) than for preschoolers or adolescents, and claims here are bounded accordingly, kept analytically separate from the longer-standing GBL and cognitive-training literature (Birtwistle et al., 2025; Gkintoni et al., 2026) addressed in the Neurocognitive Foundations section.

The data reveal a fundamental mismatch between how children's brains recover and how traditional, factory-model primary schooling delivers its curriculum, a poor fit for children still working through acute post-pandemic cognitive overload, and the starting point for the neuro-pedagogical framework proposed here, offered as a theoretical proposition requiring empirical validation, not an established effect.

First, in the absence of a practical implementation model, inadequate institutional policy support (Ministry of Education Malaysia, 2013) and limited teacher professional development erode rather than structure the practicability of neurological game-based learning in real classrooms (Plass et al., 2015). In-depth studies on curricular design, school management, and leadership support are essential to developing SDG-aligned educational strategies (Ramachandaran et al., 2025). This

disconnection reflects the isolation between these domains in the current literature: GBL research focuses on motivation and engagement without an established link to measurable neurological growth (Plass et al., 2015), while neuroeducational literature reviews focus on theoretical insights, largely ignoring their practical application in actionable, classroom-ready, game-based curricular design.

Second, even where brain-informed programmes reach the classroom, school management lacks a structured roadmap for implementation, leaving principals and administrators without structural support to scale, evaluate, and sustain these innovations.

Third, research remains at an early stage in confirming an educational model that addresses post-pandemic EF recovery in a culturally specific way within Malaysia and the wider Association of Southeast Asian Nations (ASEAN) region.

The framework is urgently needed to address these gaps, given the risk that unmitigated cognitive deficits erode the nation's capacity to generate competitive talent. The proposed NPLC maps a pathway integrating neuroscience into daily classroom practice via structured digital-analogue gameplay translating onto observable, behaviour-based neurodevelopmental indicators, embedded within a strategic management model equipping school leaders to counteract the documented 0.5 *SD* shortfall in executive function growth and drive cognitive recovery.

Theoretical Axioms and Key Definitions

Before presenting the framework's components, this section states BrainGEM Neuro360's foundational theoretical axioms explicitly, defines its key recurring term ("neuro-pedagogical insights"), and clarifies what, specifically, is proposed as new relative to the existing theories it draws on. This responds directly to the concern that bringing neuroscience, pedagogy, game-based learning, leadership, and technology into proximity does not by itself constitute a new theoretical contribution unless their interaction is specified.

Foundational Axioms

Axiom 1 (Behavioural inference). Because direct neuroimaging is not feasible in routine classroom practice, neurodevelopmental constructs (e.g., inhibitory control, working memory) are treated in this framework as inferable from structured, observable learning behaviours, not as claims requiring or implying direct neural measurement. This axiom is what licenses the NPLC's classroom-observable indicators (Table 2) as a legitimate proxy system, while also bounding what the framework can claim: behavioural inference is a weaker evidentiary basis than direct measurement, and NPLC indicators should be read accordingly.

Axiom 2 (Cycle dependency). The four NPLC phases (stimulus activation, cognitive resonance, feedback and adaptation, metacognitive reflection) are theorised as sequentially interdependent

rather than as four independent techniques that could be adopted piecemeal: each phase is proposed to condition the pedagogical opportunity available in the next (e.g., attentional engagement in Phase 1 is treated as a precondition for the pattern-recognition demands of Phase 2). This is the axiom that distinguishes the NPLC from a menu of unconnected GBL techniques and is itself a testable proposition; later empirical work could examine whether phases delivered out of sequence, or in isolation, produce weaker outcomes than the full cycle.

Axiom 3 (Nested scale-linkage). Classroom-level pedagogical practice (the NPLC) and institutional-level governance (RQ4 and Figure 4) are theorised as operating on the same underlying constructs: the same behavioural indicators that inform a teacher's in-classroom adaptation are proposed to be the ones that aggregate into the school-level data a leader would use to evaluate and scale the approach. This is the axiom that connects the classroom and leadership dimensions of the framework; without it, the leadership material would simply be existing leadership theory applied alongside an unrelated pedagogical model, rather than integrated with it.

These three axioms interact as follows: Axiom 1 sets the evidentiary basis on which Axiom 2's phase sequence is theorised, and Axiom 3 extends that basis upward into the institutional layer. BrainGEM Neuro360's distinct theoretical claim is therefore not any single construct (EF, GBL, and distributed leadership are each already well established) but this three-axiom architecture connecting a behaviourally inferred, sequentially dependent classroom cycle to a governance layer built on the same inferential logic. The Neurocognitive Foundations and Implication of the Study sections apply this architecture and should be read as applications of these axioms, not independent contributions.

Defining "Neuro-Pedagogical Insights"

The term "neuro-pedagogical insights," used throughout, refers specifically to classroom-actionable instructional principles derived from behaviourally inferred neurodevelopmental constructs under Axiom 1, e.g., translating "working memory load" into "sequence game challenges in small, immediately reinforced steps." It is distinct from (a) raw neuroscience findings, not classroom-actionable without translation; (b) generic pedagogical best practice, not necessarily grounded in a neurodevelopmental construct; and (c) learner cognitive profiling, which this paper does not undertake.

Research Questions and Objectives

The four research questions form the foundational basis for this study:

- **RQ1 (The Science):** How does GBL mechanistically activate children's post-pandemic recovery of executive functions (working memory, inhibitory control, cognitive flexibility)?
- **RQ2 (The Curriculum):** How does BrainGEM Neuro360 align with the active inquiry architecture of the IB PYP,

and what does this suggest about transferability across curricula?

- **RQ3 (The Equity Impact):** How does integrating GBL within a structured neuro-pedagogical model contribute to SDG 4 (equitable, inclusive, quality education)?
- **RQ4 (The Leadership):** What leadership architecture enables administrators to deploy, evaluate, and sustain these innovations?

Correspondingly, this study aims to:

- **The Science:** Examine how structured GBL supports post-pandemic EF recovery and identify the game-design principles driving these effects;
- **The Curriculum:** Analyse BrainGEM Neuro360's alignment with inquiry-based curricula such as the IB PYP and develop the NPLC as a transferable classroom framework;
- **The Equity Impact:** Articulate the framework's contribution to SDG 4, showing how brain-informed pedagogies can close regional cognitive disparities and foster inclusion; and
- **The Leadership:** Propose a strategic leadership model giving administrators evidence-based feedback loops for sustainable institutional innovation.

These are not equally weighted: RQ1 establishes the NPLC's neurodevelopmental basis and is this paper's primary contribution; RQ2-RQ4 examine how that core model extends to curriculum, equity, and leadership, and are read as applications of RQ1 rather than independent claims.

Neurocognitive Foundations and Post-Pandemic Context

This review distinguishes three related but non-synonymous constructs: GBL, a complete game used as the instructional vehicle (Plass et al., 2015); gamification, discrete game-like elements layered onto a non-game activity (Deterding et al., 2011); and cognitive training, structured executive-function practice without narrative framing (Birtwistle et al., 2025). BrainGEM Neuro360 draws on all three, but the NPLC itself is a GBL model. This distinction matters because the strength of evidence differs markedly across the three and claims from one should not be read as applying automatically to the others.

Neurodevelopment refers to the progressive consolidation of neural networks underlying a child's executive function, memory, and attention (Diamond, 2013), driven by experience-dependent stimuli and iterative feedback (Goldberg, 2022; Hebb, 1949; Kolb & Gibb, 2014). Structured GBL taps into this biological engine by pairing cognitive milestones with feedback-rich mechanisms; immediate game-based feedback is theorised to engage dopamine-linked motivational circuitry (Howard-Jones et al., 2016), a psychological mechanism supported by educational research but not directly measured here, treated as a theoretical proposition rather than a demonstrated effect.

This is central to post-pandemic cognitive recovery: children's working memory and mental agility fell below pre-pandemic norms (Chichinina & Gavrilova, 2022; Jones et al., 2026), and structured cognitive training

showed modest but significant EF gains (g = 0.23), strongest for younger children (57-study meta-analysis; Birtwistle et al., 2025). Gkintoni et al. (2026), reviewing 94 studies, show that educational technology centred on neuroplasticity principles supports real-time motivational engagement.

This model pairs neuroplasticity theory with established constructivist theory (Piaget, 1952; Vygotsky, 1978), underpinning the cyclical engagement-exploration-feedback-reflection progression formalised as the four-phase NPLC (described below), grounded in real classroom behaviour rather than clinical neuroimaging data (Howard-Jones, 2014; Tokuhama-Espinosa, 2018), minimising neuromyth risk and translating neuroscientific theory into measurable classroom strategies (Figure 1).

This translation is not uncontested: Bowers (2016) argues educational neuroscience rarely yields teaching methods that behavioural and psychological research could not already provide, since classroom-relevant capacities are more reliably characterised through observable performance than through neural measurement. BrainGEM Neuro360's Axiom 1 (Theoretical Axioms and Key Definitions section) is framed as a direct response to this critique: neurodevelopmental constructs are treated as inferable from structured, observable learning behaviours precisely because, consistent with Bowers's argument, behavioural inference, not neuroimaging, is what a classroom-actionable framework can credibly claim.

Effective GBL is theorised to cultivate self-directed learners, supporting schema formation through scaffolding and adaptive difficulty (Hamari et al., 2016; Mayer, 2019). The NPLC operationalises goal-setting and immediate feedback loops theorised to support attention control, cognitive flexibility, and planning; self-reflection is proposed to support neural consolidation and cognitive recovery, though this pathway is not directly measured here.

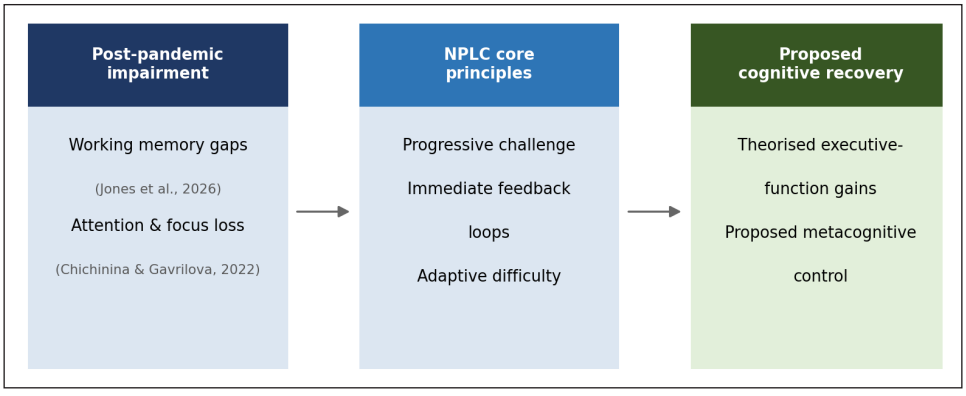

Figure 1. The scientific foundation of post-pandemic cognitive impairment and the BrainGEM Neuro360 recovery pathway: Advancing cognitive recovery in young children through the Neuro-Pedagogical Learning Cycle (NPLC)
Source: Authors' conceptual synthesis based on the reviewed literature

This aligns with the IB PYP's emphasis on student agency, transdisciplinary inquiry, and self-regulation (IBO, 2018).

AI-driven systems support active classroom design through adaptive tools and real-time feedback aligned with each child's cognitive profile (Mohd Amin et al., 2025; Niyazova et al., 2026), integrating self-regulated learning with metacognitive control (Junaštíková, 2024). This inclusive, personalised approach is intended to honour learner diversity across cultural and cognitive spectrums, advancing SDG 4 (Quality Education) in the classroom (Ramachandaran et al., 2025).

The Neuro-Pedagogical Learning Cycle (NPLC)

BrainGEM Neuro360 turns this theory into action via the Neuro-Pedagogical Learning Cycle (NPLC), a four-phase model built to answer RQ1 and RQ2 (Figure 2).

- **Phase 1:** Stimulus Activation (Attentional Readiness): sparks classroom engagement using multisensory game challenges adapted to student ability. Rooted in neuroconstructivist principles (Karmiloff-Smith, 2009), it targets the pandemic-linked executive function deficits noted above (Chichinina & Gavrilova, 2022; Jones et al., 2026) as a design intention, not a demonstrated remediation effect.
- **Phase 2:** Cognitive Resonance (Pattern Recognition): prefrontal and fronto-parietal networks are theorised to be engaged through structured, active problem-solving, mirroring Kolb's (1984) classic experiential learning cycle, with adaptive game environments calibrating challenge to each child's live skill level (Gkintoni et al., 2026).

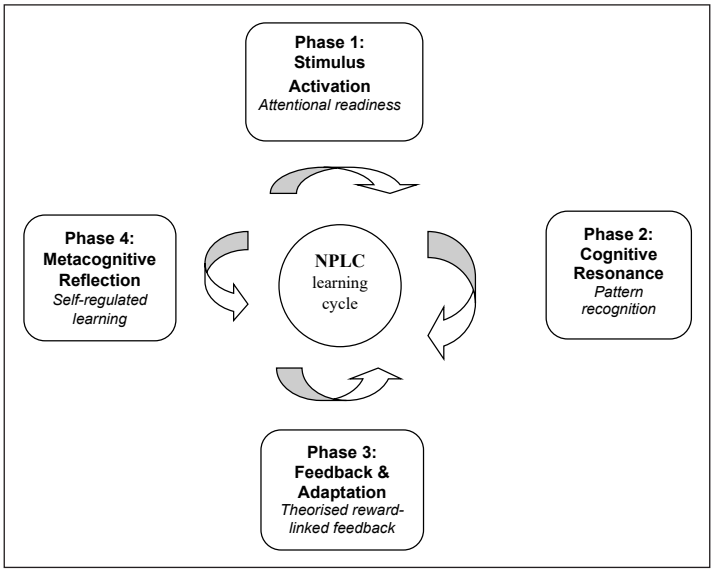

Figure 2. The four-phase Neuro-Pedagogical Learning Cycle (NPLC)
Source: Authors' conceptual synthesis based on the reviewed literature

- **Phase 3:** Feedback and Adaptation (Theorised Reward-Linked Reinforcement): newly formed neural pathways are theorised to be reinforced through immediate, game-driven feedback and student-led inquiry (IBO, 2018), engaging dopamine-linked reward processes associated in the literature with persistence and self-correction (Nadeem et al., 2023), a theoretical proposition, not directly measured here.
- Phase 4: Metacognitive Reflection (Self-Regulated Learning): helps children pause and articulate how they learned, matching established models of self-regulated reflection (Junaštíková, 2024; Zimmerman & Schunk, 2011) and supporting UN SDG 4.1.

Systemic Leadership and Innovation Governance

The NPLC bridges neuroscience and daily school management. Structured GBL correlates with sharpened spatial planning (Diamond, 2013), emotional engagement (Howard-Jones et al., 2016), and social skills (Gentile et al., 2009); AI-driven systems embedded within GBL give administrators real-time engagement analytics to scaffold curricular design and respond to individual learners' cognitive profiles.

The NPLC is mapped into a strategic management model giving administrators a roadmap to deploy, track, and scale the integration of neuroscience, pedagogy, and institutional management school-wide, reframing neuroscience from an abstract concept into an operational, strategic leadership tool, sustaining alignment with national and regional education policies across Malaysia and the ASEAN region (Ministry of Education Malaysia, 2013, 2022).

METHODOLOGY

Research Design and Justification

This study employs an integrative review methodology (Snyder, 2019; Torraco, 2005), synthesising existing literature across different domains (Jaakkola, 2020) to offer a theory-building contribution. It functions strictly as a framework-origination paper without empirical field data; its propositions are theoretically developed from this cross-domain review, establishing a strategic baseline for subsequent empirical data collection.

A structured integrative review was chosen to integrate diverse theories and evidence across domains historically independent of one another: educational neuroscience, GBL pedagogy, and school management. An integrative review and a PRISMA-guided (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) search-and-screening process are not mutually exclusive: PRISMA is primarily a reporting standard for transparency, and this study borrows PRISMA-style transparency for the search, screening, and inclusion process reported in the following subsections and Figure 3. What distinguishes this study from a PRISMA-based systematic review or meta-analysis is not structured search reporting, but the analytic goal: rather than statistically pooling effect sizes within one narrow domain, the review synthesises

qualitatively across domains for which no single body of homogeneous, poolable studies exists (Jaakkola, 2020).

Search Strategy and Database Protocols

A structured search was executed across Scopus, Web of Science, ERIC, and PsycINFO, enriched by targeted Google Scholar searches for forward citation tracking and backward citation scanning. The protocol consolidated three concept clusters via Boolean operators and database-specific filters (search-to-synthesis roadmap in Figure 3): Cluster 1 (Intervention) covered game-based learning, gamification mechanics, and hybrid digital-analogue learning; cross-referenced with Cluster 2 (Neurology: executive function, neurodevelopment, neuroplasticity) and Cluster 3 (Pedagogy and System: inquiry-based pedagogy, brain-informed leadership, curriculum governance).

Priority was given to post-pandemic peer-reviewed empirical studies, meta-analyses, and systematic reviews published in 2019-2026. Seminal theoretical literature (Diamond, 2013; Hebb, 1949; Piaget, 1952; Vygotsky, 1978) was included despite falling outside this range, given its role in the framework's conceptual foundation.

This search-and-screening process (Figure 3) was a qualitative, criteria-based funnel rather than a fully logged bibliometric count: records were narrowed through the criteria above to a final corpus of 53 sources. Consistent with this paper's conceptual status, stage-by-stage counts were not systematically logged, to avoid implying a precision the process did not have; a fully logged, PRISMA-compliant protocol is planned for the subsequent empirical validation phase.

Screening and Thematic Synthesis

Screening applied defined inclusion criteria: clear methodological or theoretical grounding; a focus on early/primary childhood (ages 3-12); and direct alignment with at least one domain. Non-peer-reviewed papers, studies lacking clear empirical or scientific grounding, and studies incompatible with school-based learning were excluded. Policy and curricular documents (Malaysian/ASEAN ministry guidelines, UN SDG frameworks, IB PYP materials) were used for primary-source context rather than treated as raw empirical metrics.

The corpus combines four source types: primary empirical studies, meta-analyses/systematic reviews, theoretical literature, and policy documents, not equally weighted. Primary studies (Eng et al., 2024; Wright et al., 2026) are most heavily caveated as single-study findings; meta-analyses/systematic reviews (Birtwistle et al., 2025; Gkintoni et al., 2026) are prioritised as a stronger, aggregated basis; seminal theoretical literature (Diamond, 2013; Piaget, 1952; Vygotsky, 1978) justifies conceptual architecture rather than serving as evidence of effect (Axiom 1); and policy documents (IBO, 2018; Ministry of Education Malaysia, 2013, 2022) establish contextual alignment only. The Conceptual Synthesis section makes this distinction explicit, separating what is

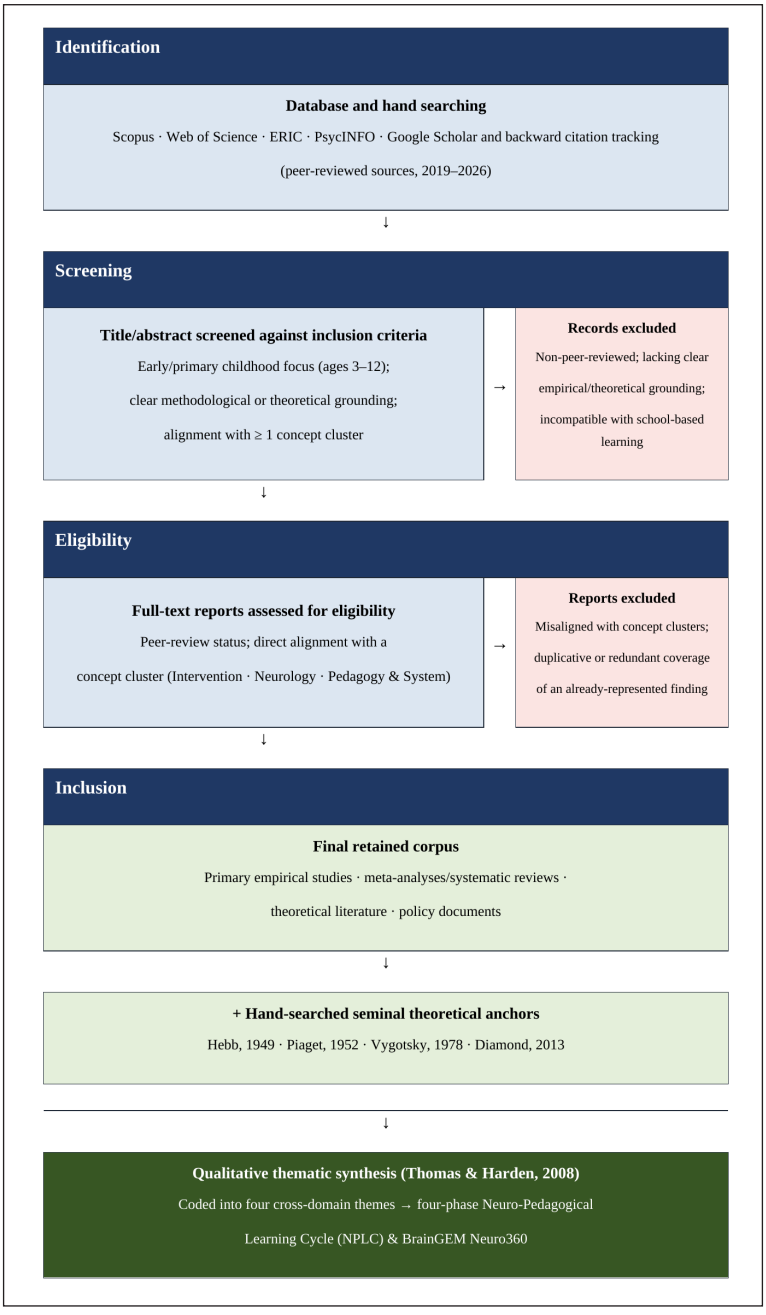

Figure 3. Qualitative search, screening, and synthesis funnel for the integrative review
Note. Consistent with this paper's status as a conceptual, framework-origination review, this diagram represents the qualitative, criteria-based logic of the search-and-screening process rather than a numerically logged PRISMA count; stage-by-stage record counts were not systematically retained during the original search and are not reported here to avoid implying a precision the process did not have. A fully logged, PRISMA-compliant protocol is planned for the subsequent empirical validation phase
Source: Authors' conceptual synthesis based on the reviewed literature

empirically established from BrainGEM's own theoretical proposition.

The finalised corpus of 53 sources was evaluated using qualitative thematic synthesis (Thomas & Harden, 2008). Recurring constructs were coded into cross-domain themes: neurodevelopmental activation, active inquiry pedagogy, feedback and metacognition, and institutional leadership, directly shaping the four-phase NPLC and the framework's broader operational architecture.

Coding Process and Reflexivity

Coding combined deductive and inductive logic: three deductive starter categories were set from the search strategy's concept clusters (Search Strategy and Database Protocols section), within which recurring constructs were grouped inductively into the four themes in Table 3, shaping the NPLC phases, e.g., feedback/error-correction sources informed "feedback and metacognition" (Phase 3), while multisensory-stimuli sources informed "neurodevelopmental activation" (Phase 1). As a conceptual synthesis rather than a formally logged qualitative study, this did not follow a documented line-by-line coding protocol; a structured, documented protocol is planned for the subsequeny empirical validation phase.

This synthesis was conducted solely by the first author, without independent co-author review, a retained audit trail, double-coding, or inter-rater reliability statistics, a limitation acknowledged here and in the Limitation and Future Research Direction section, where a structured, multi-coder protocol is planned.

Methodological Screening Matrix

The methodological parameters are synthesised in the structural matrix in Table 1.

Conceptual Mapping: Neurodevelopmental Indicators to Learning Behaviours

Table 2 operationalises BrainGEM Neuro360 by translating functionally inferred neurodevelopmental constructs

Table 1
Methodological screening matrix for the integrative review

Component	Strategy Details	Target / Criteria
Database Search	Cross-Platform Indexing	Scopus, Web of Science, ERIC, PsycINFO, Google Scholar
Core Inclusion	Timeline & Target Group	Peer-reviewed studies (2019-2026); early and middle childhood (approx. ages 3-12)
Theoretical Anchors	Foundational Baselines	Hebb (1949), Piaget (1952), Vygotsky (1978), Diamond (2013)
Contextual Scaffolding	Policy Integration	IB PYP Framework, Malaysia Education Blueprint 2013-2025, UN SDG 4

Source: Authors' conceptual synthesis based on the reviewed literature

Table 2
Mapping inferred neurodevelopmental indicators to observable learning behaviours and pedagogical strategies

Neurodevelopmental Indicator (Functionally Inferred)	Observable Learning Behaviour	Pedagogical Strategy (NPLC Alignment)
Sustained Attention (Executive Control)	On-task focus during game-based inquiry cycles	Guided inquiry with cognitive scaffolds; attention anchoring through tiered game mechanics
Working Memory (Information Integration)	Recall and integration of prior knowledge in novel tasks	Sequential game challenges requiring reflection, planning, and knowledge transfer
Emotional Regulation (Self-Regulation)	Adaptive responses to challenge; high frustration tolerance	Teacher-mediated emotional coaching; safe-failure game design principles
Cognitive Flexibility (Strategy Shifting)	Ability to alter strategies and perspectives during problem-solving	Rotational and open-ended game tasks promoting divergent and lateral thinking
Reward Sensitivity (Motivation/Persistence)	Intrinsic motivation, task persistence, and sustained engagement	Immediate feedback loops, milestone rewards, and self-progress dashboards

Source: Authors' conceptual synthesis based on the reviewed literature
Note. Indicators are functionally inferred from observable learning behaviour, not derived from direct neural tracking. Post-pandemic disruptions (Chichinina & Gavrilova, 2022; Jones et al., 2026) are directly integrated into the strategy architecture

into observable classroom behaviours and aligned pedagogical strategies, grounded in established neuroeducation literature (Diamond, 2013; Howard-Jones, 2014; Immordino-Yang & Damasio, 2007) and targeting post-pandemic working memory and cognitive flexibility deficits (Chichinina & Gavrilova, 2022; Jones et al., 2026), a blueprint for observation protocols and metrics in subsequent empirical research.

Positioning BrainGEM Neuro360 as a Progressive Synthesis

BrainGEM Neuro360 is best understood not as a critique of existing approaches but as a progressive synthesis, extending established educational thinking into an integrated, post-pandemic model. Three bodies of work inform it: Universal Design for Learning (UDL; CAST, 2018); game-based cognitive-training research showing structured, adaptive practice can support executive function (e.g., Birtwistle et al., 2025); and distributed/transformational leadership theory (e.g., Ismail et al., 2018; Senge, 2006; Townsend, 2024), building forward from each rather than against them.

Where UDL offers flexible design principles, BrainGEM Neuro360 adds a specific, sequential neurodevelopmental mechanism (Axiom 2), a concrete phase-by-phase pathway rather than a general philosophy. Where cognitive-training

research shows structured practice builds executive-function skills in isolation, BrainGEM Neuro360 embeds the same adaptive challenge within classroom pedagogy and teacher-mediated relationships rather than as a standalone drill, proposed to support more durable engagement and transfer (H1–H2; Future Hypotheses section). Where leadership theory describes how schools sustain innovation generally, BrainGEM Neuro360 proposes, via Axiom 3, a specific mechanism: nesting classroom indicators and institutional governance in the same conceptual vocabulary.

BrainGEM Neuro360's contribution is thus progressive rather than oppositional: a more integrated, institutionally connected model than exists when these approaches are applied separately, itself a proposition the proposed validation programme is designed to test.

Conceptual Synthesis

Table 3 characterises how the retained sources align with the four thematic clusters and their evidentiary strength. Representation is described qualitatively rather than counted (Coding Process and Reflexivity section), to

Table 3
Mapping of retained sources to thematic clusters and evidentiary strength

Theme	Representation	Representative Sources	Evidentiary Strength
Neurodevelopmental activation	Well represented	Bavelier & Green (2019); Birtwistle et al. (2025); Chichinina & Gavrilova (2022); Diamond (2013); Gkintoni et al. (2026); Jones et al. (2026)	Moderate - meta-analytic support for small overall effects (g = 0.23); mechanism claims (dopamine, prefrontal consolidation) inferred from behaviour, not directly measured
Active inquiry pedagogy	Well represented	Csikszentmihalyi (1990); IBO (2018); Kolb (1984); Ryan & Deci (2020); Vygotsky (1978)	Strong for pedagogical alignment (established constructivist theory); theoretical rather than GBL-specific outcome data
Feedback and metacognition	Well represented	Howard-Jones et al. (2016); Junaštíková (2024); Nadeem et al. (2023); Zimmerman & Schunk (2011)	Moderate – consistent theoretical grounding; empirical GBL-specific transfer evidence is limited
Institutional leadership	Well represented	Bass & Riggio (2006); Fullan (2014); Ismail et al. (2018); Mydin et al. (2025); Spillane (2006); Townsend (2024)	Strong for general leadership theory; no source directly evaluates leadership of neuro-pedagogical GBL specifically – applied here as an extension

Note. "Well represented" indicates that each theme draws on a substantial cross-section of the retained corpus, discussed throughout the Neurocognitive Foundations and Conceptual Synthesis sections; this is a qualitative characterisation rather than a formal bibliometric tally, and several sources contribute to more than one theme. See Coding Process and Reflexivity for the conceptual synthesis approach

avoid implying a precision the process did not have. The following RQ1–RQ4 subsections accordingly state what is empirically established before distinguishing BrainGEM's own theoretical extension, noting rather than smoothing over mixed findings (e.g., the small effect size for cognitive-training transfer; Birtwistle et al., 2025).

RQ1: GBL and Neurodevelopmental Activation (NPLC Phase 1: Stimulus Activation)

Post-pandemic evidence documents a 0.5 *SD* shortfall in children's executive function growth relative to below historical norms (Jones et al., 2026; see also Chichinina & Gavrilova, 2022). Adaptive-difficulty game-based challenges are theorised to address these deficits by engaging processes associated with prefrontal neural consolidation (Diamond, 2013), a theoretical proposition, not a directly measured outcome.

Meta-analyses report associations between adaptive game-based learning and dopamine-linked emotional engagement indicators in early cognitive development (Alotaibi, 2024; Birtwistle et al., 2025), behaviourally inferred, not neurochemically measured, and treated as a theoretical mechanism informing NPLC design. Attentional control and visual memory are similarly linked to action-based gameplay on behavioural rather than neuroimaging evidence (Bavelier & Green, 2019), and gamified executive-task practice is associated with standardised academic achievement in one feasibility study (Eng et al., 2024), a single-study association warranting caution.

In sum, the integration of progressive gameplay, multisensory input, and real-time feedback is theorised to support neuroplasticity and post-pandemic recovery, a proposition, not a demonstrated outcome, intended to rebuild the cognitive capacity children need for active, inquiry-based learning (Nadeem et al., 2023), addressing RQ1.

Pedagogically Resonant Design Within Inquiry-Based Systems (NPLC Phases 2 and 4)

A child's curiosity, grounded in experience-dependent neuroplasticity, connects to inquiry-based systems like the IB PYP through three pathways: scaffolded-difficulty gameplay corresponding to Vygotsky's (1978) zone of proximal development; intrinsic flow, balancing challenge with skill to enter Csikszentmihalyi's (1990) “optimal flow,” nurturing agency and healthy risk-taking (Ryan & Deci, 2020); and reflective metacognition, converting in-game success into self-directed knowledge, consistent with self-regulated reflection models (Junaštíková, 2024; Zimmerman & Schunk, 2011).

These pathways indicate that the NPLC suits school systems valuing student agency, inquiry, and holistic development (IBO, 2018), addressing RQ2 and suggesting transferability across curricula.

RQ3: Contribution to Sustainable Quality Education (SDG 4 Across All Phases)

BrainGEM Neuro360 operationalises three UN SDG 4 targets in the classroom. SDG

4.1 (Equitable Quality Primary Education): neuro-informed GBL provides differentiated pathways for post-pandemic-affected, neurodiverse, and high-potential learners, with the NPLC's metacognition cycle targeting the foundational skills most disrupted, pending empirical confirmation. SDG 4.7 (Critical Thinking & Global Citizenship; UNESCO, 2020): adaptive gameplay embedding emotional intelligence and cooperative problem-solving is theorised to support neural consolidation processes in routine practice. SDG 4.c: operationalising the NPLC is intended to cultivate neuroeducation literacy, shifting teachers toward genuine professional capacity-building.

This multilingual, culturally responsive design operationalises SDG 4 at curriculum and classroom-management levels, intended to close cognitive equity gaps and addressing RQ3 (Ramachandaran et al., 2025).

RQ4: Strategic Leadership for Sustainable Implementation

Three leadership mechanisms sustain neuro-educational ecosystems and scale the framework institutionally: Distributed Leadership and Teacher Empowerment (SDG 4.c), distributing ownership through shared inquiry and structured continuing professional development (CPD) (Nadeem, 2024; Spillane, 2006; Townsend, 2024); Professional Learning Communities (PLCs) practising transformational leadership to interpret cognitive data and design differentiated instruction together (Bass & Riggio, 2006; Mydin et al., 2025); and data-informed decision-making using AI-enabled formative analytics to tell a story of student growth rather than serve compliance (Fullan, 2014; Immordino-Yang et al., 2018).

Together, these pillars suggest that implementing the framework represents a cultural shift relevant to RQ4 (Figure 4).

Integrative Synthesis: BrainGEM Neuro360 as an Interdependent Ecosystem

The NPLC phases function as an integrated engine for a child's cognitive and systemic recovery: Phase 1 establishes attentional readiness against post-pandemic sensory overload; Phase 2 converts that into active,

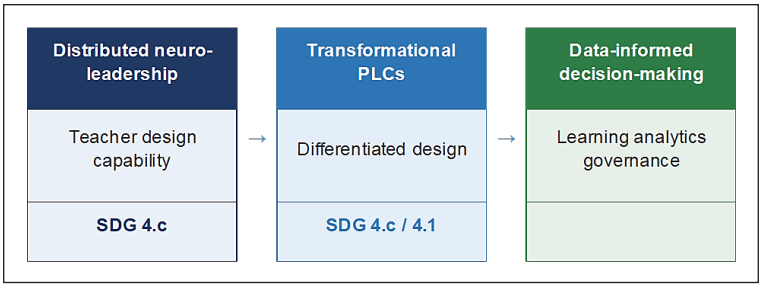

Figure 4. Strategic leadership architecture for sustaining and scaling BrainGEM Neuro360 across institutions, aligned with the targets of UN SDG 4.c and 4.1
Source: Authors' conceptual synthesis based on the reviewed literature

self-regulated problem-solving; Phase 3 uses immediate feedback theorised to engage dopamine-linked reward processes associated with durable retention (a proposition, not a measured effect); and Phase 4 cements metacognitive self-regulation for knowledge transfer, supported by an institutional leadership layer, professional learning communities, and data governance aligning with Malaysia's education blueprint, the ASEAN Education agenda, and the UN SDG vision of resilient, future-ready schools.

DISCUSSION AND CONCLUSION

Returning to the three gaps identified in the Problem Statement: the disconnect between neuroeducation research and classroom-ready game design (Gap 1) is addressed by the NPLC's translation of behaviourally inferred constructs into phase-specific moves (Axiom 1); the absent school-management roadmap (Gap 2) is addressed by nesting that cycle within the leadership architecture set out under RQ4 (Figure 4; Axiom 3) and the unconfirmed status of brain-informed models generally (Gap 3) is why this paper is positioned as a theoretical framework requiring empirical validation, not a confirmed solution.

This research introduces the theoretically grounded BrainGEM Neuro360 framework, integrating neuroscience, game-based pedagogy, and school management into a cohesive educational ecosystem. Its adaptive-difficulty gameplay mechanisms are proposed as a potential approach to address the post-pandemic neurodevelopmental recovery pathway, a set of theoretical propositions requiring empirical verification, not a demonstrated effect. Operationalised via the NPLC within inquiry-based models such as the IB PYP, the framework translates neuroscience theory into a proposed structure for daily classroom routines, intended to support SDG 4 equity mandates and offer administrators a roadmap for sustainable institutional change, pending the empirical field testing outlined in the Limitation and Future Research Direction section.

In conclusion, the NPLC is proposed as a conceptual model integrating daily classroom practice with school governance, equipping administrators with a data-informed feedback loop to evaluate, deploy, and scale brain-informed architecture, a candidate enabler of potential relevance to inclusive educational practice, pending empirical testing. As school networks navigate post-pandemic neurodevelopmental equity gaps, this model is offered as both a pedagogical framework and a governance instrument for sustainable transformation. Its capacity to help children recover, learn, and thrive remains a proposition that the proposed research programme is designed to test.

IMPLICATION OF THE STUDY

School-Level Implications

Sustaining this framework would plausibly require a shift from transactional, top-down management toward the distributed

instructional leadership already described in educational-management research (Ismail et al., 2018; Townsend, 2024). Consistent with Axiom 3, this paper applies, rather than proposes, new distributed and transformational leadership constructs (Senge, 2006), proposing that such leaders function as brain-informed instructional coordinators. Whether this shift is necessary or sufficient is an empirical question for furture research.

One future direction is equipping teachers with AI-driven, adaptive gameplay tools offering data-informed insight into student NPLC engagement, potentially freeing teacher time for relational support (cf. Mohd Amin et al., 2025; Niyazova et al., 2026), proposed for future piloting, not a system built or evaluated here.

National-Level Implications

For future consideration, the authors propose incorporating neuroeducation literacy into national teacher certification and CPD pathways (SDG 4.c), consistent with calls for structured neuroscience-literacy training (Schmied & Jamaludin, 2023) and evidence that untrained teachers hold correctable brain-based misconceptions (Grospietsch & Mayer, 2019). The NPLC's observable dimensions are similarly proposed, pending validation, as a possible national benchmarking basis, propositions for policymakers to test and debate (cf. UNESCO, 2022), not validated recommendations.

Regional-Level Implications

The NPLC is proposed, for future evaluation, as a potentially inclusive, multilingual-compatible curricular design fitting ASEAN's sociocultural diversity (Southeast Asian Ministers of Education Organization, 2021): (a) Phase 1 stimulus materials in the child's home language alongside instruction language; (b) bilingual/non-verbal Phase 3 feedback, consistent with evidence that teacher code-switching supports bilingual cognitive flexibility (Sun et al., 2020) and documented English/Malay mismatches in Malaysian preschools (Yussof & Sun, 2020); (c) teacher CPD (National-Level Implications section) on code-switching and culturally relevant content (Maaruf et al., 2025; Mohamad et al., 2018); and (d) leadership dashboards (School-Level Implications section) disaggregating engagement by language background. Whether these choices support equity, narrowing rather than widening the disparities motivating SDG 4 (Ramachandaran et al., 2025), is an empirical question for future research, not resolved here.

LIMITATION AND FUTURE RESEARCH DIRECTION

This paper identifies three natural boundaries. First, as a conceptual synthesis, the NPLC's propositions have been developed through existing literature and now await empirical verification in real-world settings. Second, while built with IB and progressive Malaysian/ASEAN systems in mind, deploying this model

within non-IB, heavily centralised, or low-resource schools may require local structural adjustments. Finally, to protect against "neuromyths" and keep classroom data actionable, all neurodevelopmental milestones are inferred from observable behaviours rather than measured directly through clinical neuroimaging.

Formal critical appraisal of source quality, not undertaken in the present synthesis (Coding Process and Reflexivity section), is planned to use the Mixed Methods Appraisal Tool (MMAT) developed by Hong et al. (2018), applied to empirical and meta-analytic sources, with theoretical and policy sources exempted given their conceptual rather than evidentiary role (Screening and Thematic Synthesis section).

The upcoming research programme involves four pathways: first, qualitative case studies tracking live implementations in diverse ASEAN classrooms; second, longitudinal mixed-methods inquiries tracking how NPLC-guided learning shapes executive functions and academic achievement over several school cycles; and third, a standardised quantitative assessment generating comparable analytics on behavioural progress and attentional control across Southeast Asian settings, refining the model while actively prioritising equitable and inclusive metrics aligned with SDG 4. Fourth, future research should examine the leadership competencies and institutional conditions enabling administrators to translate the NPLC into sustained, school-wide practice, grounding the strategic leadership architecture proposed here.

Future Hypotheses

Consistent with the axioms set out in the Introduction, the validation phase above can be organised around specific, falsifiable hypotheses rather than general pathways alone:

- **H1 (Axiom 1 test):** Teacher- and parent-rated behavioural EF indicators (Table 2) will show measurable pre–post change after a full term of NPLC exposure, relative to a non-NPLC comparison classroom.
- **H2 (Axiom 2 test):** Classrooms implementing all four NPLC phases in sequence will show stronger engagement and behavioural indicators than classrooms implementing the same activities out of sequence.
- **H3 (Axiom 3 test):** School-level aggregated NPLC indicator data will be usable by leaders to identify classrooms needing additional support, evidenced by dashboard-informed decisions corresponding to independently observed needs.
- **H4 (Equity test):** Multilingual NPLC adaptations (home-language stimulus materials, bilingual feedback) will be associated with more equitable engagement indicators across language-background subgroups than single-language delivery.

These hypotheses are proposed as a starting point for the empirical programme in this section; they are not tested in the present study and should not be read as findings.

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CONFLICT OF INTEREST

The first author is the founder of BrainGEM, the organisation that developed the BrainGEM Neuro360 framework, and therefore holds a professional and financial interest in it. The other authors declare no competing interests.

REFERENCES

Alcon, S., Shen, S., Wong, H., Rovnaghi, C. R., Truong, L., Vedelli, J. K. H., & Anand, K. J. S. (2024). Effects of the COVID-19 pandemic on early childhood development and mental health: A systematic review and meta-analysis of comparative studies. *Psychology International, 6*(4), 986-1012. https://doi.org/10.3390/psycholint6040062

Alotaibi, M. S. (2024). Game-based learning in early childhood education: A systematic review and meta-analysis. *Frontiers in Psychology, 15*, Article 1307881. https://doi.org/10.3389/fpsyg.2024.1307881

Bass, B. M., & Riggio, R. E. (2006). *Transformational leadership* (2nd ed.). Lawrence Erlbaum Associates.

Bavelier, D., & Green, C. S. (2019). Enhancing attentional control: Lessons from action video games. *Neuron, 104*(1), 147-163. https://doi.org/10.1016/j.neuron.2019.09.031

Birtwistle, E., Chernikova, O., Wünsch, M., & Niklas, F. (2025). Training of executive functions in children: A meta-analysis of cognitive training interventions. *SAGE Open, 15*(1). https://doi.org/10.1177/21582440241311060

Bowers, J. S. (2016). The practical and principled problems with educational neuroscience. *Psychological Review, 123*(5), 600-612. https://doi.org/10.1037/rev0000025

CAST. (2018). *Universal design for learning guidelines version 2.2*. https://udlguidelines.cast.org

Chichinina, E. A., & Gavrilova, M. N. (2022). Growth of executive functions in preschool-age children during the COVID-19 lockdown: Empirical evidence. *Psychology in Russia: State of the Art, 15*(2), 124-136. https://doi.org/10.11621/pir.2022.0209

Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience*. Harper & Row.

Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From game design elements to gamefulness: Defining "gamification." In *Proceedings of the 15th International Academic MindTrek Conference: Envisioning Future Media Environments* (pp. 9-15). Association for Computing Machinery. https://doi.org/10.1145/2181037.2181040

Diamond, A. (2013). Executive functions. *Annual Review of Psychology, 64*, 135-168. https://doi.org/10.1146/annurev-psych-113011-143750

Eng, C. M., Tsegai-Moore, A., & Fisher, A. V. (2024). Incorporating evidence-based gamification and machine learning to assess preschool executive function: A feasibility study. *Brain Sciences, 14*(5), Article 451. https://doi.org/10.3390/brainsci14050451

Fullan, M. (2014). *The principal: Three keys to maximizing impact*. Jossey-Bass.

Gentile, D. A., Anderson, C. A., Yukawa, S., Ihori, N., Saleem, M., Ming, L. K., Shibuya, A., Liau, A. K., Khoo, A., Bushman, B. J., Huesmann, L. R., & Sakamoto, A. (2009). The effects of prosocial

video games on prosocial behaviors: International evidence from correlational, longitudinal, and experimental studies. *Personality and Social Psychology Bulletin, 35*(6), 752-763. https://doi.org/10.1177/0146167209333045

Gkintoni, E., Sortwell, A., Vassilopoulos, S. P., & Nikolaou, G. (2026). Neuroplasticity-informed learning under cognitive load: A systematic review of functional imaging, brain stimulation, and educational technology applications. *Multimodal Technologies and Interaction, 10*(1), Article 5. https://doi.org/10.3390/mti10010005

Goldberg, H. (2022). Growing brains, nurturing minds — Neuroscience as an educational tool to support students' development as life-long learners. *Brain Sciences, 12*(12), Article 1622. https://doi.org/10.3390/brainsci12121622

Grospietsch, F., & Mayer, J. (2019). Pre-service science teachers' neuroscience literacy: Neuromyths and a professional understanding of learning and memory. *Frontiers in Human Neuroscience, 13*, Article 20. https://doi.org/10.3389/fnhum.2019.00020

Hamari, J., Shernoff, D. J., Rowe, E., Coller, B., Asbell-Clarke, J., & Edwards, T. (2016). Challenging games help students learn: An empirical study on engagement, flow and immersion in game-based learning. *Computers in Human Behavior, 54*, 170-179. https://doi.org/10.1016/j.chb.2015.07.045

Hebb, D. O. (1949). *The organization of behavior: A neuropsychological theory*. Wiley.

Hong, Q. N., Fàbregues, S., Bartlett, G., Boardman, F., Cargo, M., Dagenais, P., Gagnon, M.-P., Griffiths, F., Nicolau, B., O'Cathain, A., Rousseau, M.-C., Vedel, I., & Pluye, P. (2018). The Mixed Methods Appraisal Tool (MMAT) version 2018 for information professionals and researchers. *Education for Information, 34*(4), 285-291. https://doi.org/10.3233/EFI-180221

Howard-Jones, P. A. (2014). Neuroscience and education: Myths and messages. *Nature Reviews Neuroscience, 15*(12), 817-824. https://doi.org/10.1038/nrn3817

Howard-Jones, P. A., Jay, T., Mason, A., & Jones, H. (2016). Gamification of learning deactivates the default mode network. *Frontiers in Psychology, 6*, Article 1891. https://doi.org/10.3389/fpsyg.2015.01891

Immordino-Yang, M. H., & Damasio, A. (2007). We feel, therefore we learn: The relevance of affective and social neuroscience to education. *Mind, Brain, and Education, 1*(1), 3-10. https://doi.org/10.1111/j.1751-228X.2007.00004.x

Immordino-Yang, M. H., Darling-Hammond, L., & Krone, C. R. (2018). *The brain basis for integrated social, emotional, and academic development*. Aspen Institute. https://www.aspeninstitute.org/publications/the-brain-basis-for-integrated-social-emotional-and-academic-development/

International Baccalaureate Organization. (2018). *Primary Years Programme: Learning and teaching*. https://ibo.org/programmes/primary-years-programme/curriculum/learning-and-teaching/

Ismail, S. N., Don, Y., Husin, F., & Khalid, R. (2018). Instructional leadership and teachers' functional competency across the 21st-century learning. *International Journal of Instruction, 11*(3), 135-152. https://doi.org/10.12973/iji.2018.11310a

Jaakkola, E. (2020). Designing conceptual articles: Four approaches. *AMS Review, 10*(1-2), 18-26. https://doi.org/10.1007/s13162-020-00161-0

Jones, S. M., Dermody, C. M., Mozaffari, A. F., Acosta, J., & Lesaux, N. K. (2026). The impact of the COVID-19 pandemic on young children's executive function: A longitudinal, population-based study. *Child Development, 97*(5), 1594-1605. https://doi.org/10.1093/chidev/aacag003

Junaštíková, J. (2024). Self-regulation of learning in the context of modern technology: A review of empirical studies. *Interactive Technology and Smart Education, 21*(2), 270-291. https://doi.org/10.1108/ITSE-02-2023-0030

Karmiloff-Smith, A. (2009). Nativism versus neuroconstructivism: Rethinking the study of developmental disorders. *Developmental Psychology, 45*(1), 56-63. https://doi.org/10.1037/a0014506

Kolb, B., & Gibb, R. (2014). Searching for the principles of brain plasticity and behavior. *Cortex, 58*, 251-260. https://doi.org/10.1016/j.cortex.2013.11.012

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Prentice Hall.

Maaruf, S. Z., Shaari, H. H., Wang, L., & Ahamed Kamal, A. A. K. (2025). Engaging minds, bridging cultures: Gamified learning for adolescent cultural awareness. *Environment-Behaviour Proceedings Journal, 10*(34), 79-84. https://doi.org/10.21834/e-bpj.v10i34.7329

Mayer, R. E. (2019). Computer games in education. *Annual Review of Psychology, 70*, 531-549. https://doi.org/10.1146/annurev-psych-010418-102744

Ministry of Education Malaysia. (2013). *Malaysia Education Blueprint 2013-2025 (Preschool to post-secondary education)*. https://www.pmo.gov.my/wp-content/uploads/2019/07/Malaysia-Education-Blueprint-2013-2025.pdf

Ministry of Education Malaysia. (2022). *Malaysia Education Blueprint 2013-2025: Eleventh annual report 2022*.

Mohamad, F. S., Morini, L., Minoi, J.-L., & Arnab, S. (2018). Engaging primary schools in rural Malaysia with game-based learning: Culture, pedagogy, technology. In M. Ciussi (Ed.), *Proceedings of the 12th European Conference on Games Based Learning (ECGBL 2018)* (pp. 433-440). Academic Conferences and Publishing International.

Mohd Amin, M. R., Ismail, I., & Sivakumaran, V. M. (2025). Revolutionizing education with artificial intelligence (AI)? Challenges and implications for open and distance learning (ODL). *Social Sciences & Humanities Open, 11*, Article 101308. https://doi.org/10.1016/j.ssaho.2025.101308

Mydin, A. A., Anoar, A., & Romly, R. (2025). Driving educational innovation: The role of transformational leadership and professional learning community in Malaysian vocational college. *Innovations in Education and Teaching International*. Advance online publication. https://doi.org/10.1080/14703297.2025.2471978

Nadeem, M. (2024). Distributed leadership in educational contexts: A catalyst for school improvement. *Social Sciences & Humanities Open, 9*, Article 100835. https://doi.org/10.1016/j.ssaho.2024.100835

Nadeem, M., Oroszlanyova, M., & Farag, W. (2023). Effect of digital game-based learning on student engagement and motivation. *Computers, 12*(9), Article 177. https://doi.org/10.3390/computers12090177

Niyazova, G. Z., Duisekeyeva, B. M., Berdi, D. K., Usembayeva, I. B., & Mindetbayeva, A. A. (2026). The effects of gamified AI-supported digital learning environments on personalized learning and student engagement in school education: A systematic review and meta-analysis. *Frontiers in Education, 11*, Article 1754080. https://doi.org/10.3389/feduc.2026.1754080

Piaget, J. (1952). *The origins of intelligence in children*. International Universities Press.

Plass, J. L., Homer, B. D., & Kinzer, C. K. (2015). Foundations of game-based learning. *Educational Psychologist, 50*(4), 258-283. https://doi.org/10.1080/00461520.2015.1122533

Qian, M., & Clark, K. R. (2016). Game-based learning and 21st century skills: A review of recent research. *Computers in Human Behavior, 63*, 50-58. https://doi.org/10.1016/j.chb.2016.05.023

Ramachandaran, S. D., Yi, T. Z., Joon, L. M., Kaur, S., Jie, F. W., & Chaudery, U. (2025). Empowering women through education: Strategies for leadership development in Malaysia towards achieving Sustainable Development Goals. *International Journal of Learning, Teaching and Educational Research, 24*(1), 225-251. https://doi.org/10.26803/ijlter.24.1.12

Rivera-Urbina, G. N., Orozco-Roldán, M. F., & Molero-Chamizo, A. (2025). Executive functions in adolescence: A longitudinal study comparing evaluations before and after the COVID-19 pandemic. *Social Neuroscience, 20*(1), 16-24. https://doi.org/10.1080/17470919.2025.2457954

Ryan, R. M., & Deci, E. L. (2020). Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions. *Contemporary Educational Psychology, 61*, Article 101860. https://doi.org/10.1016/j.cedpsych.2020.101860

Schmied, A., & Jamaludin, A. (2023). Neuroscience literacy in educators' training programs in Asia: A call to action. *IBRO Neuroscience Reports, 15*, 348-354. https://doi.org/10.1016/j.ibneur.2023.10.006

Southeast Asian Ministers of Education Organization. (2021). *SEAMEO basic education standards (SEA-BES): Common core regional learning standards*. http://www.recsam.edu.my/sub_SEA-BES/index.php/about-sea-bes

Senge, P. (2006). *The fifth discipline: The art and practice of the learning organization* (Rev. ed.). Doubleday.

Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of Business Research, 104*, 333-339. https://doi.org/10.1016/j.jbusres.2019.07.039

Spillane, J. P. (2006). *Distributed leadership*. Jossey-Bass.

Sun, H., Yussof, N., Vijayakumar, P., Lai, G., O'Brien, B. A., & Ong, Q. H. (2020). Teacher's code-switching and bilingual children's heritage language learning and cognitive switching flexibility. *Journal of Child Language, 47*(2), 309-336. https://doi.org/10.1017/S030500091900059X

Thomas, J., & Harden, A. (2008). Methods for the thematic synthesis of qualitative research in systematic reviews. *BMC Medical Research Methodology, 8*, Article 45. https://doi.org/10.1186/1471-2288-8-45

Tokuhama-Espinosa, T. (2018). *Neuromyths and evidence-based practices in education*. W. W. Norton & Company.

Torraco, R. J. (2005). Writing integrative literature reviews: Guidelines and examples. *Human Resource Development Review, 4*(3), 356-367. https://doi.org/10.1177/1534484305278283

Townsend, T. (2024). The challenge to change: Leading schools beyond COVID-19. *Education Sciences, 14*(10), Article 1064. https://doi.org/10.3390/educsci14101064

UNESCO. (2020). *Education for sustainable development: A roadmap*. https://doi.org/10.54675/YFRE1448

UNESCO. (2022). *Reimagining our futures together: A new social contract for education*. https://doi.org/10.54675/ASRB4722

United Nations. (2015). *Transforming our world: The 2030 agenda for sustainable development*. https://sdgs.un.org/2030agenda

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.

Wright, A., Martin, A., Pollak, S. D., Phillips, D. A., Stein, G. L., & Johnson, A. D. (2026). COVID-19-induced educational disruptions and children's executive functioning: A longitudinal cohort study. *Developmental Psychology, 62*(4), 830-847. https://doi.org/10.1037/dev0002113

Yussof, N. T., & Sun, H. (2020). Mismatches between teacher beliefs, practices and reasons for English use in preschool Malay language classrooms. *Language and Education, 34*(4), 363-381. https://doi.org/10.1080/09500782.2020.1732394

Zimmerman, B. J., & Schunk, D. H. (Eds.). (2011). *Handbook of self-regulation of learning and performance*. Routledge.

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Strengthening Religious Character Among Generation Alpha: Teachers' Perspectives on Curriculum Integration, Active Learning, and Digital Challenges

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ABSTRACT

The rapid digitalisation and globalisation have made the question of how to keep religious character education alive in primary schools a major concern. Being raised in a technology-driven world, Generation Alpha is certainly not satisfied with the spiritual values being taught separately from 21st-century skills, as most of them consider traditional methods to be less relevant. This qualitative study explores teachers' perspectives on strengthening religious character among Generation Alpha in Islamic primary schools, with particular attention to curriculum integration, active and reflective pedagogy, school family community collaboration, and digital challenges. Through a qualitative corpus analysis design, the data of twelve seasoned Islamic primary school teachers from Central Java, Yogyakarta, and East Java were collected via semi-structured interviews and processed with Voyant Tools to recognise and illustrate the themes that appeared. The findings indicate that teachers perceived curriculum integration as supporting cognitive, affective, and practical dimensions of religious character education; active and

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reflective learning as relevant approaches for engaging Generation Alpha learners; and school-family-community collaboration as important for reinforcing value internalisation. The continuation of religious character education needs the synergy of an ecosystem of schools, families, and communities, whose cooperation is further facilitated by the creative pedagogy and digital

Keywords: Active learning, comprehensive curriculum, digital challenges, generation alpha, parental involvement, religious character

INTRODUCTION

Worldwide social changes resulting from digitalisation and globalisation have significantly influenced the educational process, especially in the aspect of religious character development in primary school children (Gharaibeh & Islam, 2024; Kayikçi & Demir, 2021). Generation Alpha is a group of children born after 2010 who are living in a digital world which is filled with technology, and they can have instant access to information (Yadav, 2025). This situation poses new challenges for education as traditional ways of teaching religion often turn out to be less effective for the needs and learning styles of this generation. Simultaneously, society still requires schools not only to make students academically competent but also to develop students' moral and spiritual characters (Akhtar, 2024; Ristiana et al., 2025). The social reality mentioned above points out the necessity for religious education to be a leader in contemporary dynamics through comprehensive, innovative, and sustainable strategies.

Several previous works of research have pointed out the necessity of incorporating religious education as a core part of the curriculum to deepen the basis of students' religious character (Isaac, 2025; Jasiah et al., 2024; Marshall, 2024). Moreover, student-centred learning approaches that are based on practice, reflection, and interaction have been proven to excite students' interest, particularly Generation Alpha, as they are more responsive to interactive and digital methods (Digout & Samra, 2023; Ragab et al., 2024; Selvakumar et al., 2025). The review of the literature also points to the fact that parental and community involvement is a very important element in the process of religious value internalisation, as character education cannot be separated from the students' social ecosystem (Hendrowibowo & Kristanto, 2024; Kobayashi & Ogawa, 2025; Mucinskas et al., 2025). Nevertheless, the majority of existing research works only partially address these aspects by focusing on the curriculum, learning methods, or community roles, thus leaving a gap for studies that consider these three dimensions as a unified analytical framework.

Through comprehensive analysis of religious education integration, active learning methods, and parental and community involvement for students' religious character development, this study intends to fill this gap. Such an approach is in line with the global Sustainable

Development Goals (SDGs), especially SDG 4 (Quality Education), and SDG 16 (Peace, Justice, and Strong Institutions), which point out the significance of quality education in raising a generation with good character and being a positive contributor to global peace (Carvalho et al., 2024; Sharifi et al., 2023). The results of this research are not only locally relevant to Indonesia but also globally for multicultural societies in which there is a need to develop value-based educational strategies suitable for the digital era (Vettriselvan, 2025). Therefore, this study may offer contextual insights for academic discussions on religious character education and may inform similar value-based educational practices in comparable multicultural and digital learning contexts.

In the digital and globalised era, religious character education faces challenges related to technological disruption, multicultural social contexts, and the need to maintain the relevance of religious values in contemporary learning environments. Previous studies have emphasised that religious education must respond to digital transformation, cultural plurality, and global social change while preserving its moral and spiritual foundations (Dzo'ul Milal et al., 2020; Genç & Uddin, 2023; Ismail et al., 2025; Kim, 2015). Based on this conceptual framework and the qualitative focus of the study, the research was guided by four research questions.

First, how do teachers perceive the integration of religious character education into the curriculum of Islamic primary schools? Second, how do teachers describe the use of active, reflective, and digitally supported learning practices in strengthening religious character among Generation Alpha? Third, how do teachers perceive the role of parents and communities in supporting religious character education beyond the classroom? Fourth, what digital challenges and teacher readiness issues are identified in maintaining the relevance and sustainability of religious character education?

These research questions are complemented by four study objectives. First, this study aims to explore teachers' perspectives on the integration of religious character education into the curriculum of Islamic primary schools. Second, it aims to examine how teachers describe active, reflective, and digitally supported learning practices for strengthening religious character among Generation Alpha. Third, it aims to investigate teachers' perceptions of parental and community support in religious character education beyond the classroom. Fourth, it aims to identify digital challenges and teacher readiness issues in maintaining the relevance and sustainability of religious character education in the digital era.

LITERATURE REVIEW

The Integration of Religious Education into a Comprehensive Curriculum

Religious education has been a major aspect of value development and is still seen as one of the essential elements. However, when religious education is combined with other subjects to create a unified curriculum, the results are not always the same across

educational contexts (Marshall, 2024). The inclusion of religion-related topics in cross-disciplinary subjects helps learners not only develop intellectual understanding but also apply moral values more naturally in life outside school (Carmody, 2025; Corpuz, 2025). The implementation of an integrated religious education curriculum has also been associated with higher social-emotional skills, such as empathy, respect, and resilience, compared with approaches in which religious education is offered only as a separate subject (Ardi et al., 2024; Astuti et al., 2020; Jovkovska et al., 2025; Kurniawan et al., 2025). Therefore, integration allows religion to be understood not merely as an isolated discipline, but as part of a comprehensive curriculum that connects academic competencies with moral and ethical foundations (Rabon, 2024).

One of the benefits of curriculum integration is that it can create a closer connection between formal education and students' socio-cultural environments. In this way, religious education may remain relevant in the era of globalisation (Azqueta & Merino, 2025). Nevertheless, previous studies also identify several challenges, such as limited teacher training for implementing integrative models and the lack of supportive policy frameworks for inclusion (Balasubramanian & Banerjee, 2024; Koç, 2025). These findings show that curriculum integration should not be understood simply by adding religious content to different subjects. Rather, it requires teacher competence, institutional support, and pedagogical planning so that religious values can be connected meaningfully with students' learning experiences and daily behaviour.

The literature therefore presents two related perspectives. On the one hand, integrated religious education can strengthen students' moral, social, and spiritual development. On the other hand, the success of this integration depends on teachers' readiness, curriculum design, and school support. This tension is important for the present study because it examines how teachers in Islamic primary schools perceive the integration of religious character education into curriculum, school routines, and classroom practices.

Active Learning Approaches in Religious Education

Active learning is considered one of the most effective ways to engage Generation Alpha, as this group of children has grown up in a technologically interactive environment. Methods involving practice, reflection, and collaboration not only increase students' participation but also deepen their understanding and commitment to religious values (Kurniawan, Bakti, et al., 2025; Purwanto et al., 2023; Sipper-Denlinger, 2021). Soboslai (2025) provides evidence that role-play, group discussions, and project-based assignments contribute significantly to students' ability to internalise abstract spiritual concepts. These findings confirm the importance of moving away from purely teacher-centred approaches toward more student-centred methodologies in religious education.

Capecchi (2024) argues that digitally assisted active learning models, such as gamification platforms and virtual simulations, can contextualise values in ways that make sense to the digital generation. When educators combine experiential methods with technology, they can design learning processes that are more immersive and help learners connect theoretical knowledge with real-life applications. This is supported by studies on interactivity and engagement in learning environments (Digout & Samra, 2023; Ragab et al., 2024; Selvakumar et al., 2025), as well as studies on the educational needs of Generation Alpha (Aşik, 2020; Höfrová et al., 2024; Jukic & Skojo, 2021).

However, the literature also indicates a tension between traditional religious instruction and digital pedagogical demands. Traditional religious education often emphasises explanation, memorisation, discipline, and normative instruction, whereas active and digital learning emphasises participation, reflection, storytelling, collaboration, and media-supported engagement. This does not mean that traditional religious instructions should be abandoned. Rather, it suggests that teachers need to adapt to religious pedagogy so that religious values remain meaningful to students who live in digital environments.

The issue of the digital divide and the sustainability of technology-supported approaches in areas with limited resources also remains important. Therefore, the literature recommends the development of hybrid models that maintain the depth of religious values while also responding to students' digital learning habits. Recent studies on students' digital skills suggest that while students may be good at finding and assessing information, they still need help with digital teamwork and being aware of security issues (Bariyyah et al., 2025). The fact that this relates to religious moral education is quite insightful as digital media should not only be focused on enhancing learning interest but also be aimed at leading students to ethical, thoughtful, and responsible use of digital media.

For this reason, the present study examines how teachers describe active, reflective, and digitally supported learning strategies in religious character education.

Parental and Community Engagement in Religious Character Formation

The involvement of parents and the community has always been a significant factor in supporting religious character education beyond the school context. Stanford et al. (2024) found that children whose parents are actively involved in religious activities and discussions tend to carry out practices at home that are more consistent with what they learn at school. Gemar (2023) also argues that community-based religious programmes create a shared commitment to transmitting values and help reduce inconsistency in students' moral development. These studies confirm that character education cannot depend only on formal institutions, because students' social lives also shape the way values are practiced.

Hoang (2024) and Malone (2020) emphasise that the coordinated efforts of schools, parents, and local communities provide sustained moral guidance and strengthen students' ability to withstand digital distractions. However, (Alam & Hamzah, 2025) argue that in urban contexts, parental engagement may be limited because of parents' work demands and weakening community ties. This indicates that parental and community involvement should not be assumed to be automatically strong or uniform across contexts. It is shaped by family conditions, community culture, time availability, and institutional support.

Therefore, it is necessary to rethink parental and community involvement not only as physical participation but also as continuity of value reinforcement across home, school, and community settings. Digital instruments, such as online parent forums or community-based learning platforms, may support this continuity, but they also require coordination and shared commitment. In the present study, parental and community involvement is examined through teachers' perspectives. This distinction is important because the data were collected from teachers, not directly from parents or community members. Therefore, the study does not claim to represent parents' or community members' direct voices but explores how teachers perceive their role in strengthening students' religious character.

Conceptual Synthesis and Analytical Framework

The reviewed literature indicates that religious character formation cannot be understood through curriculum, pedagogy, or family-community engagement in isolation. Curriculum integration provides the formal structure through which religious values are embedded across subjects, school routines, and institutional culture. Active and reflective learning explains how teachers can make those values meaningful through practice, storytelling, reflection, collaboration, and digital media. Parental and community involvement provides continuity beyond the classroom by reinforcing values in students' home and social environments.

At the same time, the literature reveals several tensions that directly inform the analytical framework of this study. First, there is a tension between religious education as normative instruction and religious education as reflective, experiential, and student-centred learning. Second, there is a tension between traditional religious pedagogy and the digital learning needs of Generation Alpha. Third, there is a tension between school-based character education and the need for family-community continuity. These tensions show that strengthening religious character requires an integrated analytical approach rather than a fragmented one.

Based on this synthesis, the analytical framework of this study links five interrelated dimensions: curriculum integration, active

and reflective learning, parental/community involvement, digital challenges, and religious character formation. Curriculum integration explains how religious values are formally embedded in school learning. Active and reflective learning explains how teachers make those values meaningful for Generation Alpha. Parental and community involvement explains how teachers perceive value reinforcement beyond school. Digital challenges explain the opportunities and constraints faced by teachers in adapting religious character education to contemporary learning environments. Together, these dimensions guide the analysis of teachers' perspectives on strengthening religious character among Generation Alpha in Islamic primary schools.

METHODOLOGY

Research Design

This study employed a qualitative interview-based design supported by corpus-assisted analysis. Participants were selected using purposive sampling with maximum variation across school types, including Integrated Islamic Primary Schools, State Islamic Primary Schools, Madrasah Ibtidaiyah, and Muhammadiyah Primary Schools. The inclusion criteria were: teachers working in Islamic primary schools, having experience in implementing religious character education, and being willing to participate in the study. Variation in teaching experience was also considered.

Semi-structured interviews were guided by questions related to curriculum integration, active and reflective learning, parental and community involvement, and digital challenges. Examples of guiding questions included: 'How do you integrate religious values into classroom learning and school routines?'; 'What active or reflective learning strategies do you use to strengthen students' religious character?'; 'How do parents and communities support religious character education?'; and 'What digital challenges do you face in teaching religious values to Generation Alpha? The interviews were transcribed verbatim, anonymised, checked for accuracy, and translated into English where necessary while preserving the meaning of participants' statements. The transcripts were cleaned by removing repeated words, interviewer prompts, and identifying information before being uploaded to Voyant Tools. Manual thematic coding was conducted first through repeated reading, initial coding, categorisation, and theme development. Voyant Tools was then used as a supporting tool to visualise word frequency, term distribution, and corpus patterns.

Participants

The study took place in four primary schools that were in Central Java, Yogyakarta, and East Java, Indonesia. The schools were chosen depending on how differently they taught religion through various methods. The research concentrates on twelve primary school teachers who are considered as the main participants, each of them having more than five years of teaching experience. These teachers were from different kinds of

schools such as Integrated Islamic Primary Schools (SD IT), State Islamic Primary Schools (SD MIN), Madrasah Ibtidaiyah (MI), and Muhammadiyah Primary Schools. The number of samples was enough for qualitative research as the major aim was to get deep insight rather than statistical generalisation. Actually, the small number of participants enhances the descriptive validity of this study.

The choice of research locations and the people involved in the study were a good match for the goals of the study, that is, to find out teachers' views about the carrying out of value-based religious character reinforcement in a contemporary educational context. As shown in Table 1, the study involved 12 teachers representing different educational backgrounds, teaching roles, levels of teaching experience, school affiliations, and gender.

Table 1
Summary of participant characteristics

Category	Frequency
Education - S2 TIK	1
Education - S1 English	1
Education - S1 PGSD	4
Education - S1 PAI	6
Status - Subject Teacher	6
Status - Class Teacher	6
Teaching Experience > 6 Years	9
Teaching Experience < 5 Years	3
School - MIN	3
School - MI	3
School - SD IT	3
School - SD Muhammadiyah	3
Gender - Male	5
Gender - Female	7

*(N=12)

Ethics Approval

The research was conducted in line with moral standards by securing the privacy of those involved. All participants provided informed consent before the interviews. Their identities and school names were anonymised using participant codes. The data were stored securely and used only for research purposes. Confidentiality and data protection procedures were applied throughout the study. Ethical clearance was obtained from the Institute for Research and Community Service, Indonesia (Approval No.: 12.9.15/UN32.14/PB/2025).

Research Stage

The research phases (Figure 1) turned out to be the following core six: (1) Preparation and Data Collection - the data were primarily obtained through semi-structured interviews with 12 primary school teachers. The focus of the interviews was on teaching practices related to the reinforcement of religious characters, the methods used, and the difficulties experienced; (2) Data Gathering - in order to obtain rich data, more interviews were carried out; (3) Data Analysis - the data obtained were analysed thematically with the help of Voyant Tools to locate the keywords, themes, and the relationships between the themes in the interview transcripts; (4) Data Processing - The credibility of the findings was strengthened through peer debriefing, audit trail, member checking, and comparison between coded excerpts and corpus visualisations. The researchers discussed coding differences to refine the themes and reduce interpretive bias.

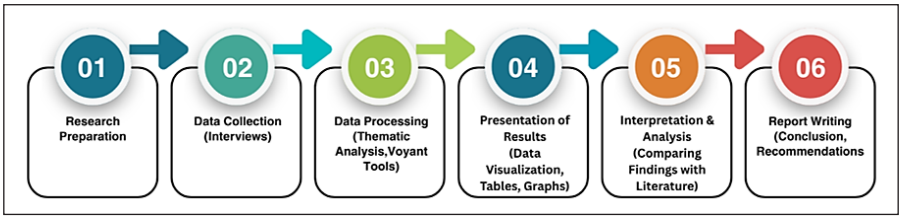

Figure 1. Research procedure

Reflexivity was maintained by acknowledging the researchers' background in education and Counselling and by ensuring that interpretations remained grounded in participants' narratives. Data saturation was considered reached when the final interviews no longer produced substantially new themes beyond curriculum integration, active learning, school family community collaboration, and digital challenges; (5) Presentation of Findings - the narratives reflecting the researchers' findings were supported by tables and figures to make the presentation more vivid and easier for the reader to grasp; and (6) Reporting - the research conclusions and recommendations were written down and presented in the final.

Data Analysis and Interpretation

Data from interviews were assessed with the help of Voyant Tools that allowed the researchers to carry out thematic analysis conjointly with the visualisation of the most frequent words and the interaction of the themes (Gregory et al., 2022; Kairaitytė-Užupė et al., 2023; Sánchez Tarragó, 2021). Using this instrument, the researchers identified patterns emerging from the interview data and used these patterns as supporting evidence for interpreting teachers' perspectives on religious character education. The interpretative outputs were pictured with the help of words and relations between them in graphical and diagrammatic form to make the understanding of the results easier. Such a presentation of findings is likely to reveal not only more aspects but also the depth of the teachers' instructional practices in reinforcing the religious character.

RESULTS

Theme 1: Curriculum Integration of Religious Character

The corpus visualisation in Figure 2 indicates that terms such as religion, Qur'an, prayer, students, education, morality, character, and values appeared frequently in teachers' narratives. These patterns were interpreted alongside manual thematic coding, which showed that teachers perceived religious character education as being integrated not only into formal religious subjects but also into school routines and cross-curricular learning activities.

One teacher stated:

> Religious values are not only taught in Islamic Religious Education lessons.

> In other subjects, we also connect them with honesty, responsibility, discipline, and respect for classmates. Thus, students not only understand religious teachings, but also learn to practice them in their daily activities at school. (G3, classroom teacher translated from Indonesian)

This quotation indicates that curriculum integration was understood by teachers as a process of embedding religious values into subject learning, daily routines, and student behaviour. The occurrence of terms such as narratives and prophetic figures suggests that teachers used contextual pedagogical strategies to connect religious values with students' life experiences. Meanwhile, terms such as morality, character, prayer, and fiqh indicate that religious character education was perceived as involving cognitive, affective, and practical dimensions. The word cloud also shows the prominence of terms such as religion, prayer, students, education, lesson, values, activities, and experience, suggesting that religious education was linked not only to worship practices but also to structured learning activities and daily school experiences.

Overall, these findings suggest that teachers perceived curriculum integration as a way to position religious education beyond a separate subject. Religious values were described as being embedded horizontally across classroom learning, school routines, and student interactions, allowing students to connect religious knowledge with attitudes and daily practices.

Theme 2: Active and Reflective Learning for Generation Alpha

The dominant terms in this theme included values, reflection, practice, engagement, interactive, storytelling, media, digital, and applications (Figure 3). These terms suggest that teachers perceived active and reflective learning as relevant for engaging Generation Alpha in religious character education.

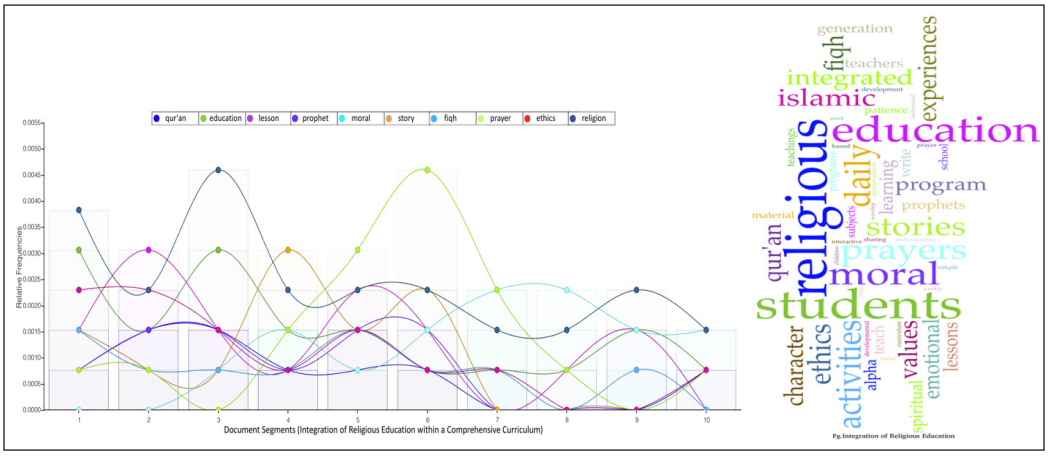

Figure 2. Trend graph and word cloud of curriculum integration in religious character education

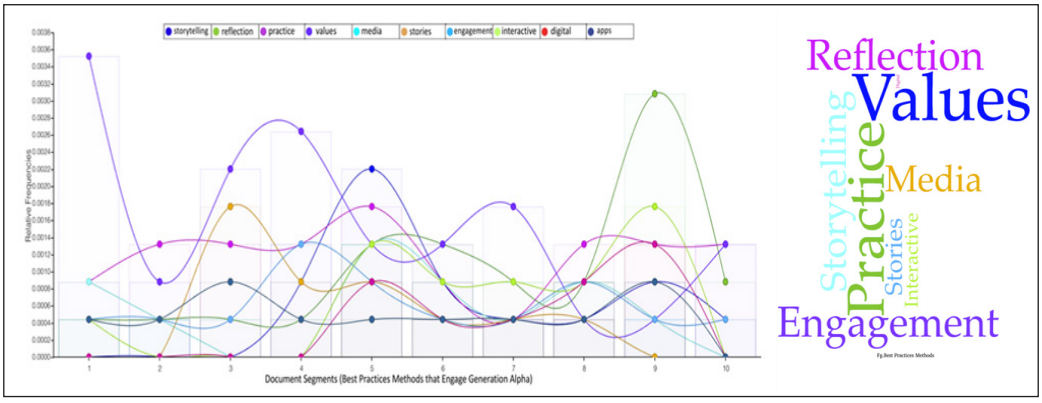

Figure 3. Trend graph and word cloud of active and reflective learning methods

One teacher explained:

> Students today are more interested when religious learning is active. If the lesson is delivered only through lectures, they quickly become bored. I usually use stories, short videos, group discussions, or simple games so that they can become more involved. (G7, subject teacher, translated from Indonesian)

This quotation shows that teachers used storytelling, discussion, simple games, and digital media to make religious character education more participatory and meaningful. It also indicates that active and reflective learning was perceived as a way to connect religious values with the learning preferences of Generation Alpha.

The frequent appearance of values, reflection, and practice indicates that teachers viewed religious education not merely as the transfer of knowledge, but as a process of value internalisation. Reflection was used to help students relate religious teachings to their own experiences, while practice-based activities encouraged them to apply moral and spiritual values in daily life. Similarly, the terms of engagement and interactive suggest that teachers attempted to move beyond passive learning by creating classroom activities that required student participation.

The co-occurrence of storytelling, media, digital, and applications further indicates that teachers connected religious character education with creative and technology-supported pedagogy. Storytelling served as a narrative strategy for introducing moral and religious values in ways that were closer to students' experiences. Meanwhile, short videos, digital media, and interactive applications were used to make learning more relevant to students who are familiar with technology. However, these digital tools were not viewed as ends in themselves, but as supporting resources for strengthening reflection, engagement, and value-based learning.

Overall, the findings suggest that teachers perceived active and reflective learning as a suitable approach for religious character education among Generation Alpha. This approach combines values, reflection, practice, interaction, and digital support to make religious learning more meaningful, participatory, and connected to students' everyday lives.

Theme 3: School Family Community Collaboration

The word cloud and word distribution graph (Figure 4) indicate that the terms of religion, parents, community, activities, figures, students, home, parenting, values, morality, and school appeared frequently in teachers' narratives. These dominant terms suggest that teachers perceived religious character education as extending beyond classroom instruction and requiring continuity between school, family, and community environments.

The prominence of the terms of parents, community, and figures indicates that teachers viewed families, social environments, and role models as important sources of support for students' religious character formation. Meanwhile, terms such as activities, social, school, home, and sermons suggest that religious values were perceived as being reinforced through routine practices at home, school activities, and community-based religious activities.

One teacher stated:

> The school can teach prayer, good manners, and discipline, but if these values are not practiced at home, students will find it difficult to be consistent. Therefore, we always remind parents that the habits developed at school need to be continued at home. (G4, classroom teacher, translated from Indonesian)

This quotation indicates that teachers viewed religious character formation as a shared responsibility between school and family. It also shows that school-based religious character education was perceived

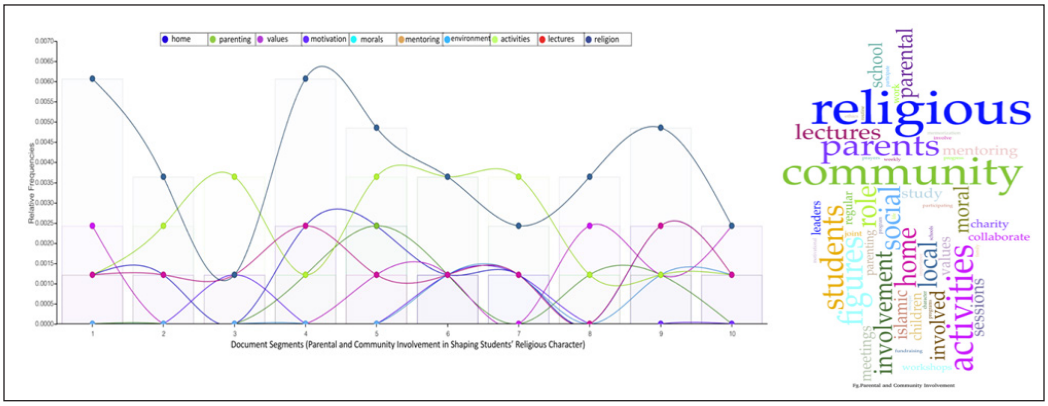

Figure 4. Trend graph and word cloud of school family community collaboration

as requiring reinforcement beyond the classroom. Because the data were collected only from teachers, this finding is framed as teachers' perceptions of parental and community involvement rather than as a direct claim about parents' or community members' views.

From teachers' perspectives, parents were seen as important figures in continuing religious habits at home, while community activities were perceived as providing social spaces where students could practice religious values collectively. The integration of school, family, and community was therefore understood as a supporting ecosystem for religious character education. However, the findings should be interpreted cautiously, as the study did not directly interview parents, students, or community members.

Overall, this theme suggests that teachers perceived school-family-community collaboration as an important form of support for strengthening students' religious character. Rather than demonstrating a causal effect, the data indicate how teachers understood the continuity of religious values across school, home, and community settings.

Parents serve as the first educators, instilling moral and spiritual values at home, while the community provides a social arena for practice and the reinforcement of religious identity through collective activities, sermons, and study circles. The integration of home, school, and community creates a comprehensive ecosystem of religious education, enabling students not only to acquire cognitive understanding but also to internalise and embody religious values in their daily behaviour.

Theme 4: Digital Challenges and Teacher Readiness

In the theme of digital challenges (Figure 5) and teacher readiness, dominant terms included religion, students, education, teachers, challenges, morality, media,

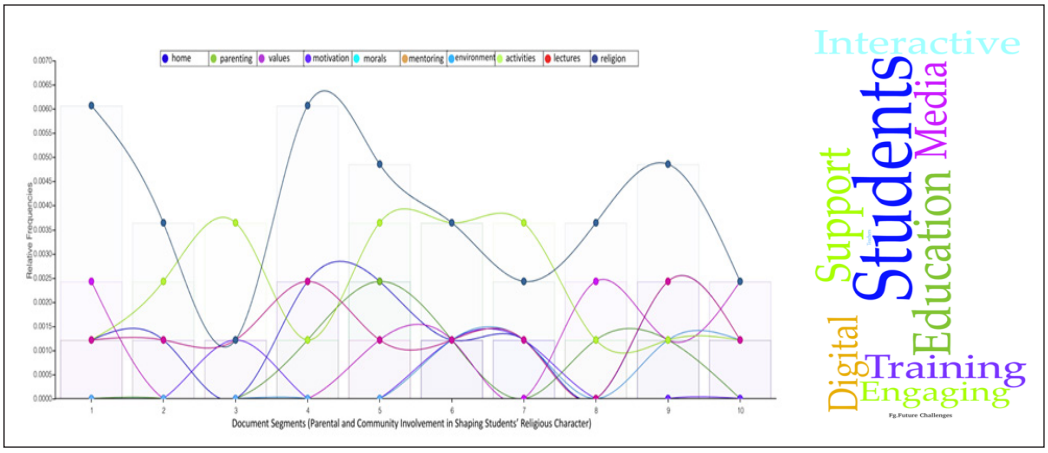

Figure 5. Trend graph and word cloud of digital challenges and teacher readiness

digital, interactive, support, and training. These terms indicate that teachers perceived digitalisation as both an opportunity and a challenge for sustaining religious character education. The prominence of religion suggests that teachers continued to position religious values as the core of character formation, while the terms digital, media, and interactive reflect the need to adapt religious learning to students' digital environments.

One teacher explained:

> The greatest challenge today is that students are very close to gadgets. On the one hand, technology can support learning. On the other hand, students are also easily influenced by content that is not aligned with religious values. (G8, classroom teacher, translated from Indonesian)

This quotation shows that teachers recognised the pedagogical potential of digital media while also emphasising the need for guidance, ethical control, and teacher readiness. It indicates that technology was not perceived only as a learning resource, but also as a source of distraction and moral concern for students. This concern is in line with the recent discourse on social networking dependency wherein it is suggested that students' digital engagement should not be solely measured by academic performances but also, and more importantly, by their developmental aspects such as digital literacy, adaptability, emotional resilience, and responsible online behaviour at the very least (Suhardita et al., 2026). Considering the religious character education, from that angle, it can be interpreted that the teachers' roles are not limited to only assisting the students' digital media usage for academic purposes but also to help them develop self-regulation and ethical awareness when dealing with content online.

The word distribution graph also shows the recurring presence of terms such as students, education, teachers, support, and training. These terms suggest that teachers viewed digital adaptation as a shared educational responsibility. Teachers are expected to design religious learning that is relevant to Generation Alpha, while schools need to provide support and training so that digital media can be used appropriately. In this sense, teacher readiness becomes an important condition for adapting religious character education to the digital era.

The emergence of media, digital, and interactive in the corpus further indicates that religious education needs to respond to students' familiarity with technology. However, digital tools should not be used merely to make lessons more entertaining. From teachers' perspectives, digital media should support reflection, value internalisation, and moral guidance. Therefore, the challenge is not simply whether technology should be used, but how it can be used responsibly to strengthen religious character without weakening students' discipline, manners, and spiritual awareness.

Overall, this theme suggests that future challenges in strengthening religious

character are related to three main issues: maintaining religious values amid digitalisation and globalisation, improving teacher readiness to use digital media appropriately, and building collaboration among schools, families, and communities. These findings suggest that, from teachers' perspectives, religious character education for Generation Alpha requires adaptation, innovation, and guidance while maintaining its moral and spiritual foundations.

DISCUSSION

The first finding suggests that, in the context of Islamic primary schools in Java, religious character education is not limited to formal religious subjects. Empirically, teachers described religious values as being embedded in classroom instruction, daily worship routines, school culture, and teacher modeling. This context is significant because Islamic primary schools in Java often combine curriculum-based religious instruction with habitual practices such as prayer, Qur'anic learning, greetings, discipline, and moral conduct. The authors interpret this pattern as indicating that religious character formation operates as a moral ecology rather than as a single subject-based intervention.

The frequent usage of the words religion and Qur'an indicates the establishment of a strong normative basis in the development of the curriculum, which is in line with the concept of a comprehensive curriculum that links core values across different disciplines (Nislev, 2020; van Lambalgen & van der Tuin, 2024). This method gives a moral basis while at the same time, it embeds the values in every learning aspect. The integration discussed here corresponds with the opinions of Andrei, (2023) and Demirtaş (2023), which claim that a comprehensive religious education should cover cognitive, affective, and psychomotor domains. Thus, religious education becomes less abstract as students not only gain conceptual knowledge but are also led to developing attitudes and life skills in line with spiritual values.

The second finding shows the significance of active learning methods that are based on practice, reflection, and engagement. The major occurrence of the word's values, reflection, practice, and interactive points to the fact that methods which focus on student involvement are more suitable for Generation Alpha. This finding is in agreement with active learning theory, which highlights that direct experience is the most effective way of knowledge construction (Aricò & Lancaster, 2018; Demirtaş et al., 2023; Lim, 2025; Schmidt & Libre, 2020; Selvakumar et al., 2025). Generation Alpha, being a tech-savvy from their early years, demands learning styles that can merge religious values with digital innovation (Aşik, 2020; Höfrová et al., 2024; Jukic & Skojo, 2021). The appearance of storytelling and digital applications in the research is a proof that narrative and interactive teaching strategies can not only elevate student engagement but also their understanding (Lazareva & Cruz-Martinez, 2021; Modi et al., 2024; Navas Romero, 2025; Ungerer, 2019).

Hence, religious education that is suitable for Generation Alpha should take tech as a vehicle for value internalisation and not just a tool for fun.

The third finding points out that families and communities are the main sources that help build the religious character of students. The prominence of the term parents and community points to the understanding that schools are not alone in the responsibility to provide religious education as the home, and the wider social environment also have their roles. The findings of the study by (Kobayashi & Ogawa, 2025; Manilal & Jairam, 2023) suggest that involvement of parents and community members promotes the success of character education. The parenting styles and motivation patterns unveiled by the data put forward not only the great role of parental upbringing in the internalisation of religious values but also community engagement through sermons or social activities as a way of providing a collective space for the practice of spiritual values. These results support Bronfenbrenner's Ecological Systems Theory that the educational environment of a child is influenced by the interaction of the microsystem (family), mesosystem (school), and exosystem (community) (Fulantelli et al., 2021; Hampden-Thompson & Galindo, 2017). The findings suggest that teachers perceived collaboration among school, family, and community as important for sustaining religious character education. This interpretation is consistent with Bronfenbrenner's ecological systems theory, which emphasises the interaction between family, school, and community environments. However, because the data were collected from teachers, this conclusion is framed as teachers' perception of ecological support rather than as direct evidence from parents or community members.

The fourth finding points out the main issues that religious education needs to solve in the future, especially during the period of digitalisation and globalisation. The majority of the words of challenges, digital, interactive, and support reveal the need to change the strategies for the reinforcement of religious character in the technological ecosystem. These findings are in line with the results of the research by (Ghofar et al., 2024; Sati et al., 2025), which suggests that religion in the digital era is in a dilemma position of either keeping the traditional values or adjusting to the technological changes. The teachers' and parents' roles are becoming very important as the standard of future learning will depend mainly on the teachers' ability to blend technology and values (Nurhidayat et al., 2024; Thapa et al., 2024). The other issue is to keep religious teachings attractive for young generations who are very likely to be distracted by the consequences of globalisation (Bećirović, 2023; Sepadi et al., 2025). In this way, religious education should focus on innovation, collaboration, and sustainability to be still a moral anchor in the time of change.

Although this study is context-specific, its findings may offer relevant insights for value-based education that aligns with

the broader aims of SDG 4 on quality education and SDG 16 on peaceful and inclusive societies. This connection should be understood as an interpretive implication rather than a direct empirical claim. From teachers' perspectives, the integration of religious education into the curriculum, the use of active and reflective learning, and the perceived support of families and communities may contribute to educational practices that promote moral development, student engagement, and socially responsible behaviour. In this sense, digitally contextualised religious education can be understood as one possible approach to supporting character-oriented learning in primary education, while still requiring further empirical investigation across broader participant groups and contexts.

The worldwide implications of these results are in the great necessity of changing religious education practices to be prepared for the 21st century challenges such as digitalisation, cultural pluralism, and moral identity crises. This study provides contextual insights that may inform discussions among multicultural societies regarding strategies for strengthening religious character education. Also, these findings highlight the need for collaboration among teachers, parents, communities, and educational policymakers to create an ecosystem that will not only nurture the religious character but also be sustainable. In this way, the outcomes not only extend to the Indonesian context but also offer insights to the international community about the role of value-based education as a powerful tool for promoting peace, justice, and the strengthening of social institutions at the global level.

CONCLUSION

This study suggests that, from teachers' perspectives, religious character education in Islamic primary schools can be strengthened through curriculum integration, active and reflective learning, school-family-community collaboration, and careful adaptation to digital challenges. The findings indicate that teachers viewed religious character formation as a process that extends beyond formal religious subjects and is supported by daily school routines, classroom practices, family habituation, and community religious activities. The study also shows that teachers perceived active and reflective learning as relevant for Generation Alpha. Storytelling, discussion, practice-based activities, reflection, and digital media were described as ways to make religious values more meaningful and connected to students' daily experiences. However, digital technology was also perceived as a challenge, particularly because students are increasingly exposed to gadgets and online content that may not always support religious and moral development. Rather than offering broad generalisations, this study contributes contextual evidence on how teachers in Islamic primary schools in Java understand the need to adapt religious character education to the learning characteristics and digital experiences of Generation Alpha.

The main contribution of this study lies in showing how curriculum, pedagogy, school-family-community collaboration, and digital readiness are interconnected in teachers' perceptions of religious character formation.

IMPLICATION OF THE STUDY

The implications of this study are organised into practical, policy, and theoretical implications. This organisation is intended to clarify how the findings may inform schools, teachers, policymakers, and future academic discussions on religious character education in the digital era. Practical implications: Schools and teachers can strengthen religious character education by integrating religious values into classroom learning, daily school routines, storytelling, reflective activities, and guided digital media use. Teachers can design active learning activities that connect religious values with students' daily experiences while ensuring that technology is used to support, rather than replace moral reflection and habituation. In this way, digital media can function as a pedagogical resource for making religious learning more engaging, while still maintaining the core purpose of character formation.

Policy implications: School leaders and policymakers should provide teacher training on digital pedagogy for religious character education, develop guidelines for ethical digital media use, and strengthen structured collaboration between schools, parents, and communities. Such support is important because teachers in this study perceived digitalisation as both an opportunity and a challenge. Policies should therefore not only encourage the use of technology but also ensure that digital tools are used responsibly to support students' moral, spiritual, and social development.

Theoretical implications: This study contributes to discussions on religious character education by showing how curriculum integration, active and reflective learning, ecological collaboration, and digital challenges interact in shaping teachers' perspectives on character formation among Generation Alpha in Islamic primary schools. The findings suggest that religious character formation should be understood as an integrated process involving curriculum, pedagogy, school culture, family support, community involvement, and digital readiness. Rather than presenting a universal model, this study offers context-specific implications that may inform similar value-based education practices in comparable Islamic, multicultural, and digitally mediated school contexts.

LIMITATION AND RECOMMENDATION

This study is limited to Islamic primary schools in Java and relies solely on teachers' perspectives. It did not include students, parents, or community members as direct participants; therefore, the findings should be understood as teachers' perceptions rather than direct accounts from all stakeholders involved in religious character education. This limitation is important

because religious character formation involves multiple actors, including students, families, schools, and communities. Another limitation concerns the use of corpus-assisted word-frequency analysis. Although Voyant Tools helped visualise dominant terms and patterns in the interview corpus, word-frequency analysis cannot fully capture the complexity of religious meaning-making, moral development, and value internalisation. Therefore, the corpus visualisation in this study should be understood as a supporting tool rather than the main source of qualitative interpretation. Future studies should involve students, parents, and community members to provide a more comprehensive understanding of religious character education. Further research may also use larger and more diverse samples, compare Islamic and non-Islamic school contexts, and expand the geographical scope beyond Java. In addition, longitudinal or mixed-method designs are recommended to examine how religious character education develops over time and how digital methods influence students' moral and spiritual development in different educational contexts.

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REFERENCES

Akhtar, J. (2024). Guiding Light: Former Educators' Contributions to Student Development Through Spiritual Education. In E. K. West (Ed.), *Former Educators' Roles in Supporting Student Growth and Learning* (pp. 275–305). IGI Global. https://doi.org/10.4018/979-8-3693-6427-7.ch011

Alam, S., & Hamzah, R. (2025). The role of parental involvement in promoting education for sustainability in primary schools. *Asian Education and Development Studies*, *14*, 563–578. https://doi.org/10.1108/AEDS-07-2024-0151

Andrei, O. (2023). Enhancing religious education through emotional and spiritual intelligence. *HTS Teologiese Studies / Theological Studies*, *79*(1). https://doi.org/10.4102/hts.v79i1.7887

Ardi, Lufri, Amran, A., Kosasih, A., & Hervi, F. (2024). The effect of Islam and science integration implementing on science learning in Indonesia: A meta-analysis. *International Journal of Evaluation and Research in Education*, *13*(4), 2594–2602. https://doi.org/10.11591/ijere.v13i4.27632

Aricò, F. R., & Lancaster, S. J. (2018). Facilitating active learning and enhancing student self-assessment skills. *International Review of Economics Education*, *29*, 6–13. https://doi.org/10.1016/j.iree.2018.06.002

Aşik, G. (2020). Measurement and evaluation in alpha classes. In N. Yurtseven (Ed.), *The Teacher of Generation Alpha* (pp. 109–118). Verlag Peter Lang AG.

Astuti, B., Ihwanudin, M., Kusuma, H. H., & Yulianto, A. (2020). Development and effectiveness of integrated science learning modules using vogarty integrated method based on Al-qur'an verses complementation. *J. Phys. Conf. Ser.*, *1567*(4). https://doi.org/10.1088/1742-6596/1567/4/042090

Azqueta, A., & Merino, D. (2025). Religious Education and Prevention of Violent Radicalization: Analysis of Catholic and Islamic Education Curricula in Spain. *International Journal of Religion and Spirituality in Society*, *15*(1), 1–18. https://doi.org/10.18848/2154-8633/CGP/v15i01/1-18

Balasubramanian, L., & Banerjee, I. (2024). Invoking the Divine on the Path to Inclusive Education: India's Contextual Realities. *Remedial and Special Education*, *45*(6), 380–387. https://doi.org/10.1177/07419325241260751

Bećirović, S. (2023). Challenges and Barriers for Effective Integration of Technologies into Teaching and Learning. In *Springer Briefs in Education* (pp. 123–133). Springer Science and Business Media B.V. https://doi.org/10.1007/978-981-99-0444-0_10

Capecchi, I., Bernetti, I., Borghini, T., Caporali, A., & Saragosa, C. (2024). Augmented reality and serious game to engage the alpha generation in urban cultural heritage. *Journal of Cultural Heritage*, *66*, 523–535. https://doi.org/10.1016/j.culher.2024.01.004

Carmody, B. (2025). Religious education: Learning what from studying religions? *British Journal of Religious Education*, *47*(3), 389–399. https://doi.org/10.1080/01416200.2024.2436919

Carvalho, L., Almeida, D., Loures, A., Ferreira, P., & Rebola, F. (2024). Quality Education for All: A Fuzzy Set Analysis of Sustainable Development Goal Compliance. *Sustainability (Switzerland)*, *16*(12). https://doi.org/10.3390/su16125218

Corpuz, J. C. G. (2025). Teaching death, spirituality, and palliative care to university students: Novel pedagogical approach. *Palliative & Supportive Care*, *23*, e36. https://doi.org/10.1017/S1478951524001330

Demirtaş, Z., Takunyaci, M., & Yeşil, R. (2023). Investigation of Religious Education Teacher Candidates' Cognitive Flexibility Levels and Critical Thinking Tendencies. *Hitit Theology Journal*, *22*(2), 723–744. https://doi.org/10.14395/hid.1334350

Digout, J., & Samra, H. E. (2023). Interactivity and engagement tactics and tools. In N. Azoury & G. Yahchouchi (Eds.), *Governance in Higher Education: Global Reform and Trends in the MENA Region* (pp. 151–169). Springer Nature. https://doi.org/10.1007/978-3-031-40586-0_8

Dzo'ul Milal, A., Rohmah, Z., Kusumajanti, W., Basthomi, Y., Sholihah, D. N., & Susilowati, M. (2020). Integrating character education in the english teaching at islamic junior high schools in Indonesia. *Teflin Journal*, *31*(1), 88–107. https://doi.org/10.15639/teflinjournal.v31i1/88-107

Gemar, A. (2023). Parental Influence and Intergenerational Transmission of Religious Belief, Attitudes, and Practices: Recent Evidence from the United States. *Religions*, *14*(11), 1373. https://doi.org/10.3390/rel14111373

Genç, M. F., & Uddin, A. H. M. E. (2023). The model of religious education in today's secular and multicultural societies–Post-Confessional Inclusivist Religious Education (PCIRE). *British Journal of Religious Education*, *45*(2), 127–137. https://doi.org/10.1080/01416200.2022.2122934

Gharaibeh, F. A., & Islam, M. R. (2024). GLOBALIZATION AND THE ARAB FAMILY SYSTEM: A CRITICAL ANALYSIS OF PERCEIVED THREATS AND CHALLENGES. *Journal of Globalization Studies*, *15*(1), 77–94. https://doi.org/10.30884/jogs/2024.01.05

Ghofar, A., Fawwaz, M., Prestianawati, S. A., Mubarak, M. F., Manzilati, A., & Imamia, T. L. (2024). Young muslim generation's preferences for using digital platforms for Zakat payments: A cross-country study of Indonesia and Malaysia. *Journal of Infrastructure, Policy and Development*, *8*(6). https://doi.org/10.24294/JIPD.V8I6.3249

Gregory, K., Geiger, L., & Salisbury, P. (2022). Voyant Tools and Descriptive Metadata: A Case Study in How Automation Can Compliment Expertise Knowledge. *Journal of Library Metadata*, *22*(1–2), 1–16. https://doi.org/10.1080/19386389.2022.2030635

Hendrowibowo, L., & Kristanto, W. (2024). Parental Involvement in Character Education of Young Children. *International Journal of Early Childhood Learning*, *31*(1), 1–23. https://doi.org/10.18848/2327-7939/CGP/v31i01/1-23

Hoang, A., Sanders, M. R., Turner, K. M. T., Morawska, A., Cobham, V., Chainey, C., & Simmons, E. (2024). Connecting families, schools, and communities: A systems-contextual approach to sustainable futures for children. *Sustainable Development*, *32*(5), 4505–4517. https://doi.org/10.1002/sd.2911

Höfrová, A., Balidemaj, V., & Small, M. A. (2024). A systematic literature review of education for Generation Alpha. *Discover Education*, *3*(1). https://doi.org/10.1007/s44217-024-00218-3

Isaac, A. M. (2025). Changing the Relation of Science and Religion through Integrated Islamic Curricula: A Theoretical Position on Faith-Based Science Education. *Austral Comunicacion*, *14*(2). https://doi.org/10.26422//aucom.2025.1402.isa

Ismail, Parinduri, M. A., & Ibarra, F. P. (2025). STRENGTHENING THE IDEOLOGY OF ISLAMIC RELIGIOUS EDUCATION IN THE ERA OF TECHNOLOGICAL DISRUPTION. *Jurnal Ilmiah Ilmu Terapan Universitas Jambi*, *9*(2), 465–473. https://doi.org/10.22437/jiituj.v9i2.41841

Jasiah, Mazrur, Hartati, Z., Rahman, A., Kibtiyah, M., Liadi, F., & Fahmi. (2024). Islamic Teachers' Implementation of the Merdeka Curriculum in Senior High Schools: A Systematic Review. *International Journal of Learning, Teaching and Educational Research*, *23*(4), 394–408. https://doi.org/10.26803/ijlter.23.4.21

Jovkovska, A., Barakoska, A., & Gjorgjevski, G. (2025). The role of the subject "ethics in religions" in shaping value systems among primary school students in contemporary macedonian society. *Occasional Papers on Religion in Eastern Europe*, *45*(5), 160–181. https://doi.org/10.55221/2693-2229.2642

Jukic, R., & Skojo, T. (2021). The Educational Needs of the Alpha Generation. *Int. Conv. Inf., Commun. Electron. Technol., MIPRO - Proc.*, 564–569. https://doi.org/10.23919/MIPRO52101.2021.9597106

Kairaitytė-Užupė, A., Ramanauskaitė, E., & Rudžionis, V. E. (2023). Scientific Information Analysis Using Text Analysis Tool "Voyant Tools." *Information and Media*, *97*, 25–48. https://doi.org/10.15388/IM.2023.97.57

Kayikçi, K., & Demir, Ü. (2021). Multi-program schools and rising new values in education: Intercultural communication, world citizenship and peace education. In S. Özgüzel (Ed.), *Century: Theories and Practices* (pp. 35–66). Akademisyen Yayinevi Kitabevi.

Kim, H.-S. (2015). Seeking Critical Hope in a Global Age: Religious Education in a Global Perspective. *Relig. Educ.*, *110*(3), 311–328. https://doi.org/10.1080/00344087.2015.1039389

Kobayashi, T., & Ogawa, K. (2025). Community and parental participation in Ugandan public primary education: A mixed-method analysis. *International Journal of Educational Development*, *113*. https://doi.org/10.1016/j.ijedudev.2025.103225

Koç, A. (2025). Religious and Pedagogical Education in Theology Faculties in Türkiye in Their 100th Year: A Comparative Analysis with Similar Programs in the World. *Religions*, *16*(1). https://doi.org/10.3390/rel16010049

Kurniawan, R., Bakti, I. K., Firmansyah, M., Bahri, R., Kholis, N., & Kusaeri. (2025). Islamic emotional-cognitive integration: How Islamic

education shapes students' cognitive processes and outcomes through expressive writing. *British Journal of Religious Education*. https://doi.org/10.1080/01416200.2025.2523385

Kurniawan, R., Bulan, S., Kholis, N., Suryani, S., & Kusaeri, K. (2025). Cognitive religious alignment in expressive writing: Insights from Islamic schools. *Reading and Writing (South Africa)*, *16*(1). https://doi.org/10.4102/rw.v16i1.528

Lazareva, A., & Cruz-Martinez, G. (2021). Digital Storytelling Project as a Way to Engage Students in Twenty-First Century Skills Learning. *International Studies Perspectives*, *22*(4), 383–406. https://doi.org/10.1093/isp/ekaa017

Lim, W. M. (2025). What Is Qualitative Research? An Overview and Guidelines. *Australasian Marketing Journal*, *33*(2), 199–229. https://doi.org/10.1177/14413582241264619

Malone, H. J. (2020). Community schools: Bridging educational change through partnerships. *Journal of Educational Change*, *21*(3), 487–497. https://doi.org/10.1007/s10833-020-09375-2

Marshall, H. (2024). Reimagining religious education: Integrating ethnographic and anthropological perspectives. *British Journal of Religious Education*, *46*(4), 534–548. https://doi.org/10.1080/01416200.2024.2373778

Modi, S., Gupta, T., & Rahmatullah, M. (2024). Digital Storytelling as a Tool for Global Citizenship and Sustainability: Enhancing Cross-Cultural Understanding in Education. *Journal of Interdisciplinary Studies in Education*, *13*(Special Issue 1), 65–104. https://doi.org/10.32674/s817ax14

Mucinskas, D., Clark, S., Barendsen, L., & Gardner, H. (2025). An increase in educator expectations of student character growth during participation in a community of practice. *Frontiers in Education*, *10*. https://doi.org/10.3389/feduc.2025.1466295

Navas Romero, C. (2025). User-Friendly Digital Tools: Boosting Student Engagement and Creativity in Higher Education. *European Public and Social Innovation Review*, *10*. https://doi.org/10.31637/epsir-2025-963

Nislev, E. (2020). Integrated learning. In D. Pendergast & K. Main (Eds.), *Teaching Primary Years: Rethinking curriculum, pedagogy and assessment* (pp. 330–351). Taylor and Francis. https://doi.org/10.4324/9781003117797-17

Nurhidayat, E., Mujiyanto, J., Yuliasri, I., & Hartono, R. (2024). Technology integration and teachers' competency in the development of 21st-century learning in EFL classroom. *Journal of Education and Learning*, *18*(2), 342–349. https://doi.org/10.11591/edulearn.v18i2.21069

Purwanto, Y., Saepudin, A., & Sofaussamawati. (2023). THE DEVELOPMENT OF REFLECTIVE PRACTICES FOR ISLAMIC RELIGIOUS EDUCATION TEACHERS. *Jurnal Pendidikan Islam*, *9*(1), 107–122. https://doi.org/10.15575/jpi.v0i0.24155

Rabon, M. W. (2024). Integration of Spiritual Formation in Higher Education Courses. *Christian Education Journal*, *21*(3), 376–392. https://doi.org/10.1177/07398913241302839

Ragab, K., Martínez-Jiménez, E., & Fernandez-Ahumada, E. (2024). Engaging Minds—Unlocking Potential with Interactive Technology in Enhancing Students' Engagement in STEM Education. In A. Elsayary & A. Olowoselu (Eds.), *Interdisciplinary approaches for Educators' and Learners' Well-being: Transforming Education for Sustainable Development* (pp. 53–66). Springer Nature. https://doi.org/10.1007/978-3-031-65215-8_5

Ristiana, H., Mahmud, A., Suminar, T., & Wasino. (2025). Building morality: The role of character education, learning environment, and motivation. *Perspektivy Nauki i Obrazovania*, *73*(1), 566–582. https://doi.org/10.32744/pse.2025.1.36

Sánchez Tarragó, N. (2021). Uncovering open access criticisms by visualizing texts with voyant tools. *Revista Cubana de Informacion en Ciencias de la Salud*, *32*(1).

Sati, A., Halim, A., Nasution, A. H., & Ridwan, M. (2025). The Digital Transformation of Tafsir and Its Implications for Islamic Legal Derivation in the Contemporary Era. *MILRev: Metro Islamic Law Review*, *4*(1), 389–415. https://doi.org/10.32332/milrev.v4i1.10425

Schmidt, J., & Libre, N. A. (2020). Implementation and evaluation of active learning techniques: Adaptable activities for a variety of engineering courses. *ASEE Annu. Conf. Expos. Conf. Proc.*, *2020-June*.

Selvakumar, P., Babitha, B. S., Varalakshmi, S., Mishra, B. R., Bhaskar, P., & Manjunath, T. C. (2025). Learning methods: Techniques for disadvantaged learners. In S. Hai-Jew (Ed.), *Mitigating Learner Disadvantages in Teaching and Learning* (pp. 207–230). IGI Global. https://doi.org/10.4018/979-8-3693-8623-1.ch008

Sepadi, M., Kgaphola, T., & Molapo, K. (2025). Teachers' understanding of technology usage in rural schools. *Frontiers in Education*, *10*. https://doi.org/10.3389/feduc.2025.1548457

Sharifi, A., Simangan, D., & Kaneko, S. (2023). Bridging Peace and Sustainability Amidst Global Transformations. In *World Sustainability Series: Part F1990* (pp. 2–10). Springer Science and Business Media Deutschland GmbH. https://doi.org/10.1007/978-981-99-7572-3_1

Sipper-Denlinger, K. (2021). Reflective Models of Service Learning: Connections to Faith, Learning, and Vocation in Pre-Service Teachers. *Christian Higher Education*, *21*(1–2), 127–144. https://doi.org/10.1080/15363759.2021.2004264

Soboslai, J. (2025). Immersive Religion: Using Extended Reality Resources for Teaching the Academic Study of Religion. *Journal of Interactive Learning Research*, *36*(1), 101–112.

Stanford, W. D., Futris, T. G., Brown, G. L., & Lemons, J. D. (2024). Parental and contextual influences on religious transmission in adolescence. *Applied Developmental Science*, *28*(3), 391–408. https://doi.org/10.1080/10888691.2023.2223999

Thapa, P., Jaheer Mukthar, K. P., & Aoun, M. (2024). The Role of Educators in Integrating Technology into Education: A Conceptual Proposition. In *Studies in Systems, Decision and Control* (Vol. 537, pp. 635–644). Springer Science and Business Media Deutschland GmbH. https://doi.org/10.1007/978-3-031-62106-2_48

Ungerer, L. (2019). Digital Storytelling: Possible Applications in an Open Distance E-learning Environment. In *At the Interface: Probing the Boundaries* (Vol. 122, pp. 74–87). Brill Academic Publishers. https://doi.org/10.1163/9789004396401_012

van Lambalgen, R., & van der Tuin, I. (2024). Teaching integration. In R. Szostak (Ed.), *Handbook of Interdisciplinary Teaching and Administration* (pp. 114–135). Edward Elgar Publishing Ltd. https://doi.org/10.4337/9781035309870.00016

Vettriselvan, R. (2025). Empowering digital education: The future of value-based learning in the digital era. In B. B. Sousa & C. M. Veloso (Eds.), *Empowering Value Co-Creation in the Digital Era* (pp. 199–227). IGI Global. https://doi.org/10.4018/979-8-3373-1742-7.ch009

Yadav, R. (2025). The role of technology in shaping generation alpha's environmental values. In C. Seker (Ed.), *Generation Alpha and Next Generation Leadership for Greener Futures* (pp. 197–212). IGI Global. https://doi.org/10.4018/979-8-3693-9281-2.ch010

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When Eco-STEAM Meets Mamayu Hayuning Bawana: An Edutainment-Based Approach to Sustainability Education and Computational Thinking in Elementary Schools

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ABSTRACT

Amid the global sustainability crisis, elementary schools require learning designs that help students understand and respond to environmental problems in meaningful ways. This study developed an Eco-STEAM model integrated with edutainment and grounded in Mamayu Hayuning Bawana to strengthen sustainability education and students' computational thinking in elementary schools. The model engaged students in identifying, exploring, and solving real environmental problems around the school through science, technology, engineering, arts, mathematics, educational games, and reflection on local cultural values. This research used a research-and-development approach with a modified Borg and Gall model. Data were collected through needs analysis, expert validation, readability testing, classroom observation, response questionnaires, and computational thinking tests. The findings indicated that the developed model met the criteria for validity, practicality, and effectiveness. Students improved decomposition, pattern recognition, abstraction, and algorithmic design in the context of environmental problem-solving. These findings suggest that integrating Eco-STEAM, edutainment, and Mamayu Hayuning

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Bawana offers a contextual, enjoyable, and culturally grounded approach to sustainability learning in elementary education.

Keywords: Eco-STEAM, edutainment, Mamayu Hayuning Bawana, sustainability education, computational thinking

INTRODUCTION

Environmental problems are increasingly present in children's everyday school life, from waste and water use to school gardens, classroom cleanliness, and energy consumption. For elementary students, these issues can become meaningful starting points for learning when they are treated not only as school rules, but also as real problems to observe, question, and solve. Sustainability education at the elementary level therefore needs to move beyond delivering environmental concepts. It should involve students in tracing causes, designing possible responses, and reflecting the effects of their actions. Recent work in environmental and sustainability education shows that schools need pedagogical innovation that connects classroom learning with real environmental issues, students' everyday lives, and action-oriented inquiry (Van Poeck et al., 2025). In early childhood and elementary education, STEM/STEAM approaches are also seen as promising ways to connect sustainability issues with interdisciplinary learning, especially when children are given opportunities to explore ecological problems through concrete, visual, and inquiry-based activities (Rodrigues-Silva & Alsina, 2023). This is true for elementary schools, as children are not removed from the realities of waste, water use, school plants, energy saving, and school cleanliness. These are all challenges that are a part of their everyday school experience. If these problems are viewed as learning rather than as school-related problems, students can start to develop ecological awareness, responsibility, and problem-solving skills. In this context, sustainability education needs a learning design that is cognitively meaningful, emotionally engaging, culturally grounded, and appropriate for children's developmental characteristics.

One educational innovation that may respond to this need is the integration of Eco-STEAM, edutainment, and local wisdom in elementary school learning. Eco-STEAM provides an interdisciplinary learning structure by connecting science, technology, engineering, arts, and mathematics with ecological issues and sustainability problem-solving. Studies on STEAM education have shown that students' project competence and learning motivation may increase when learning is designed through exploratory, creative, and authentic problem-solving activities (Lin & Tsai, 2021). STEAM implementation in elementary schools also requires clear curricular support, relevant problems, and careful teacher facilitation so that interdisciplinary learning does not stop as a shallow project activity (Quigley et al.,

2020). Edutainment was used to enhance the Eco-STEAM orientation in this study. This approach can be implemented using educational games, stories, simulations, quizzes, group challenges, and creative tasks for learning sustainability problems. This element is important because access to learning experiences that are serious in purpose but accessible in form is important for elementary students. Research on educational games shows that game-based activities can support the development of computational thinking among elementary students when they are pedagogically structured and connected to clear thinking processes (Giannakoulas & Xinogalos, 2024). At the same time, this study integrates Mamayu Hayuning Bawana as a local wisdom value that emphasises harmony, care, balance, and human responsibility in relation to nature and social life. This value positions environmental problem-solving not only as a technical activity but also as an ethical and cultural practice. Studies on culturally grounded mathematics education and local practices show that cultural knowledge can humanise learning by connecting formal knowledge with students lived experience and cultural identity (Huencho & Chandía, 2023; Orey & Rosa, 2022).

Mamayu Hayuning Bawana is a Javanese philosophical expression that can be translated as "to beautify and preserve the harmony of the world." It is built from three root ideas — *memayu* (to beautify, to care for, to improve), *hayu* (safety, well-being, harmony), and *bawana* (the world, the shared living space) — and is commonly used in Javanese ethical discourse to describe a person's duty to maintain balance between the self, other people, and nature (Wagiran, 2013). In this study, the value is operationalised through five reflective dimensions embedded in the learning tools: harmony, care, responsibility, cooperation, and the common good (Table 7). We state this definition explicitly here, at first mention, in response to reviewer feedback that the term had not been defined before being used throughout the article.

This study aims to develop and examine an Eco-STEAM Edutainment model based on Mamayu Hayuning Bawana as an approach to sustainability education and computational thinking in elementary schools. Computational thinking is not positioned here as a narrow programming skill. Rather, it is understood as a way of reasoning that helps students understand and respond to sustainability problems systematically. In STEM education, computational thinking is understood as a cross-disciplinary problem-solving ability that supports decomposition, pattern recognition, abstraction, and algorithmic reasoning (Wang et al., 2022). Recent studies have also shown that teachers need structured pedagogical support to meaningfully integrate computational thinking into K-12 classroom practice, especially when the ability is expected to appear across subjects and not only in computer lessons (Liu et al., 2024). In sustainability learning, these components can help students break environmental problems into smaller parts,

identify repeated patterns, select relevant information, and arrange logical action steps. In addition, the cognitive effects of computational thinking relate to planning, problem-solving, and higher-order thinking processes. This makes it relevant for learning designs that ask students to move from understanding problems to proposing and evaluating solutions (Montuori et al., 2024). By bringing Eco-STEAM, edutainment, Mamayu Hayuning Bawana, and computational thinking into one learning model, this study addresses a gap in previous work, where sustainability education, STEAM, game-based engagement, local wisdom, and computational thinking are often discussed separately rather than as an integrated pedagogical design for elementary education. This direction builds on the authors' own related work showing that digitally mediated problem-based learning integrating local cultural values can enhance both computational thinking and cultural identity among primary school students (Mardhatillah et al., 2026) and is consistent with evidence that elementary students' cognitive flexibility is closely related to their broader literacy and reasoning performance (Rahayuningsih et al., 2025a).

Two clarifications about the scope and design logic of this study are stated explicitly here, in response to reviewer feedback on an earlier version of this manuscript. First, this article focuses specifically on the design, validation, and field testing of the Eco-STEAM Edutainment model's effect on elementary students' computational thinking; it does not report a separately validated, standalone measure of environmental awareness or pro-environmental behaviour as a second dependent variable. Evidence bearing on students' environmental-ethical awareness is nevertheless reported through the Mamayu Hayuning Bawana reflection responses, teacher and student interview excerpts, and classroom-observation data as complementary, descriptive evidence of the model's broader pedagogical function, and its limits are discussed explicitly as an avenue for future research using a validated environmental-attitude instrument (see Discussion and Conclusion). Second, Eco-STEAM and Mamayu Hayuning Bawana are retained as two distinct, non-redundant components of the model rather than two labels for the same construct. Eco-STEAM operates in the cognitive-interdisciplinary domain: it supplies the disciplinary lenses (science, technology, engineering, arts, mathematics) and the structured activities through which students decompose, pattern-match, abstract, and sequence solutions to an environmental problem. Mamayu Hayuning Bawana operates in the affective-axiological domain: it supplies the evaluative criteria — harmony, care, responsibility, cooperation, and the common good — that students use to judge whether a technically workable solution is also ethically and socially sound. This distinction follows the classic separation between the cognitive and affective domains of learning objectives (Krathwohl, 2002): Eco-STEAM structures how students think through a problem, while Mamayu Hayuning Bawana shapes why and for whom a solution matters. Although

both components are ultimately in service of environmental awareness in a broad sense, they are not redundant, because a student can complete the cognitive steps of a solution (Eco-STEAM) without engaging its ethical dimension, and the reflection data reported in the Results section indicate that the two functioned as distinguishable, complementary processes rather than as a single repeated construct.

LITERATURE REVIEW

Sustainability Education in Elementary Schools: From Environmental Awareness to Action

Sustainability education in elementary schools can be understood as an educational practice that connects environmental knowledge with real action in students' everyday lives. At this level, sustainability education does not only aim to introduce ecological concepts. It also helps students recognise how environmental problems appear around them and how they can take part in responding to those problems. Research on sustainability competences in primary education shows that children need opportunities to develop knowledge, values, skills, and agency through concrete learning experiences that are close to their world (Vesterinen & Ratinen, 2024). Place-based environmental learning also shows that elementary students' environmental literacy can be strengthened when they engage directly with local places, observe environmental conditions, and connect learning tasks with real experience (Tabaru Örnek & Yel, 2025). Thus, the school setting can be a dynamic setting for the learning of sustainability. Some of these topics can turn into opportunities for investigation and engagement for example, on waste, water consumption, energy conservation, school gardens, and cleanliness in the classroom. It is important because, in the primary schools, SE should not be just awareness. It must provide opportunities for the progressive development of awareness of issues, questions, discussion of ideas and appropriate action.

Another way to strengthen sustainability education in elementary schools is to position students as active participants in the learning process. A whole-school approach to sustainability emphasises that student participation is not an additional element but an important part of developing action competence and democratic engagement in sustainability practices (Torsdottir, et al., 2024a). When students have the opportunity to share, make choices, and consider environmental actions, they come to understand that sustainability is a personal practice, not a slogan. This involvement might be as simple as identifying waste habits, offering ideas on how to conserve water use, setting up a classroom plant care schedule, or developing a poster and routine to minimise plastic consumption in the elementary classroom. These activities might seem straightforward but assist children to have experiences of environmental care that can be done together and again.

Sustainability education also needs the school environment and classroom to become part of the learning process. Studies

Table 1
Key characteristics of sustainability education in elementary schools

Key Characteristics of Sustainability Education in Elementary Schools
Learning begins with real environmental problems around the school
Students participate in identifying, discussing, and responding to problems
The school environment becomes a space and source for learning
Learning activities combine inquiry, collaboration, and simple action
Environmental awareness is connected with responsibility and daily practice
Students are guided to move from knowing problems to designing solutions

on whole-school approaches have shown that school development for sustainability education requires pedagogical, organisational, social, and material support (Gericke & Torbjörnsson, 2022). This signifies that the learning of sustainability cannot happen exclusively through teachers' explanations. It needs to be taught, the school culture needs to be supportive, environmental practices need to be visible, and students need to be involved in the process. Classrooms, gardens, water taps, waste bins, corridors and schoolyards can all be learning resources within elementary schools. If the school environment is utilised in this manner, students can see that what they learn is linked to what they experience, and what they can change.

All these elements demonstrate that the practice of sustainability education in the elementary schools is shifting from knowledge of the environment to learning with, through and for the environment. Sustainability education involves awareness, involvement, questioning, co-operation and action. Not only is there a focus on being able to identify environmental issues, but students are also expected to be able to consider their causes, consequences and design solutions. This shift is in line with the idea that student participation is related to students' perceived action competence for sustainability, especially when schools provide students with opportunities to be involved in decision-making and sustainability-oriented practices (Torsdottir et al., 2024). In elementary education, the movement from awareness to action must be carefully designed so that activities remain age-appropriate, meaningful, and pedagogically guided. These characteristics are summarised in Table 1.

Such attributes highlight the need for elementary sustainability education to be more than just about the environment. It demands learning designs that are able to make school experiences relevant moments for inquiry and action. It is through this "Eco-STEAM Edutainment" model that this change was built in this study. Eco STEAM is an approach to learning and problem solving that uses science, technology, engineering, arts and math to approach environmental issues. This exploration is made more accessible through edutainment activities, that are fun,

creative and emotionally engaging. Mamayu Hayuning Bawana builds the value base of learning by focusing on harmony, caring, and responsibility towards nature and social life. As a result, sustainability education is not just a knowledge to memorise but a thinking, feeling and doing approach to sustainability and the environment.

The movement from environmental awareness to action also requires students to work on problems that are open enough to invite thinking but manageable enough for elementary learners. Research on school-based sustainability shows that sustainability practices need to be woven into school culture and supported by clear roles, relationships, and routines, rather than treated as separate classroom activities (Finnegan, 2023). For the elementary students it is about ensuring that environmental learning is linked to everyday life and observable activities. Students can research why waste segregation is not successful, notice patterns in water consumption, measure the growth of plants in varying conditions or create a short sequence to clean the classroom. Students can gain the practical awareness of environmental issues through such activities and link this with the practical sense of reasoning.

In this study, sustainability education is positioned as the main pedagogical framework for the Eco-STEAM Edutainment model. The model is designed to help students move from recognising environmental issues to tracing their causes, designing possible solutions, testing ideas, and reflecting the values behind their actions. This orientation is consistent with recent research showing that students' experiences of influencing society can support action competence for sustainability, especially when learning provides opportunities to move beyond passive awareness toward participation and agency (Torsdottir et al., 2024b). In elementary schools, this agency may begin with small actions. However, pedagogically, these small actions matter because they allow students to experience themselves as being able to contribute to more sustainable living.

In this study, sustainability education in elementary schools was not treated as a separate environmental lesson. It is understood as a learning orientation that connects local environmental issues, interdisciplinary exploration, enjoyable learning experiences, and value reflection. Therefore, Eco-STEAM, edutainment, Mamayu Hayuning Bawana, and computational thinking were combined into one framework. Sustainability issues provide the context. Eco-STEAM provides an interdisciplinary structure. Edutainment provides a strategy for learning engagement. Mamayu Hayuning Bawana provides an ethical and cultural orientation. Computational thinking provides the structured reasoning needed to understand and respond to environmental problems. In this way, this article positions sustainability education as a movement from environmental awareness toward reflective and responsible action.

Eco-STEAM, Edutainment, and Local Wisdom as Educational Innovation

Educational research shows that sustainability-oriented learning innovation requires not only a change in content but also a change in how teachers design learning experiences. In elementary schools, the integration of Eco-STEAM, edutainment, and local wisdom can be understood as a pedagogical innovation because it shifts learning from concept delivery to real-problem exploration, interdisciplinary work, enjoyable learning experiences, and value reflection. Research on STEAM in elementary schools shows that STEAM learning has the potential to connect science, technology, engineering, arts, and mathematics through creative and meaningful activities; however, its implementation still requires clear guidance on content, pedagogical strategy, and assessment (Yim et al., 2025). Another review of STEAM in science classrooms explains that this approach has developed in response to the need for 21st-century skills; however, it still faces challenges in learning design, teacher readiness, and interdisciplinary integration (Yulianti et al., 2024). Thus, Eco-STEAM in this article is not positioned merely as another term for STEAM. It is an expansion of STEAM that explicitly places environmental and sustainability problems as the starting point of learning.

As a form of learning innovation, Eco-STEAM requires a different approach from ordinary thematic or project-based lessons. Teachers do not only choose interesting activities. They also need to ensure that the activities connect environmental problems with interdisciplinary concepts and measurable learning goals. Research on STEAM implementation in elementary schools shows that this type of learning has developed through various models, media, and contextual approaches; however, it still faces pedagogical, technical, facility, learning-resource, and time-management challenges (Erawan et al., 2025). In sustainability education, teacher readiness is also important because STEAM for sustainability requires teachers to understand environmental issues, design interdisciplinary activities, and guide students in investigating real problems (Álvarez Ariza & Olatunde-Aiyedun, 2024). Therefore, Eco-STEAM needs to be arranged as a model with clear syntax, learning tools, media, and instruments so that teachers can use it realistically in the classroom. Without such a design, Eco-STEAM may remain an interesting creative activity but become weakly connected with students' thinking outcomes and sustainability actions. This is consistent with meta-analytic evidence that integrated, interdisciplinary learning approaches remain relevant and effective for cultivating 21st-century skills, provided the integration is pedagogically well designed rather than superficial (Aka et al., 2025).

The edutainment element strengthens this innovation because elementary students need learning forms that fit their age, interests, and ways of building experience. Edutainment is not intended as entertainment separate from learning goals. Instead, it is a strategy for packaging sustainability

problems into interesting, interactive, and purposeful activities. A review of STEM, STEAM, and makerspaces in early childhood shows that learning through exploration, concrete tools, and creative activities can broaden children's opportunities to learn through experimentation, design, and problem-solving (Johnston et al., 2022). Research on environmental edutainment games in elementary school also shows that environmental games can influence pro-environmental behavioural tendencies, especially when the activities are designed as behavioural interventions close to children's experience (Dubois et al., 2025). In the model developed in this study, edutainment appears through educational games, environmental stories, quizzes, simple simulations, challenge cards, and group work. These activities allow students to try, discuss, make decisions, and revise solutions without losing the main purpose of learning. This is in line with the authors' prior findings that blended and technology-mediated learning designs can simultaneously strengthen students' problem-solving abilities and shared values such as solidarity (Kasmini et al., 2024), and that ICT-based learning media can meaningfully improve elementary students' learning outcomes when the media is purposefully integrated into the lesson rather than used as an add-on (Mardhatillah et al., 2020).

In addition to providing enjoyable experiences, local wisdom is important because sustainability education is always related to values, identity, and how communities understand their relationship with nature. A systematic review of indigenous and local knowledge in sustainability education shows that local knowledge can enrich environmental learning by bringing cultural perspectives, human-nature relations, and knowledge justice into educational practice (Druker-Ibáñez & Cáceres-Jensen, 2022). In culturally grounded learning, the relationship among ethnomathematics, STEAM, and everyday practices also shows that formal knowledge can become more humane when connected with students' social and cultural experiences (Rodríguez-Nieto & Alsina, 2022). In this article, Mamayu Hayuning Bawana is positioned as a local value that provides ethical direction to learning. This value emphasises harmony, care, balance, and human responsibility toward nature and shared life. Therefore, local wisdom is not treated as a cultural ornament. It becomes a reflective framework that helps students judge whether the environmental solutions they design are aligned with ecological and social responsibility. Wagiran (2013) identifies memayu hayuning bawana as one of the core value systems used in Javanese character education, in which the individual is positioned as having a continuous ethical duty to maintain balance among the self, fellow human beings, and the natural world; the value is transmitted less as an abstract doctrine than as a disposition enacted through everyday care, cooperation, and restraint. This direction extends the authors' earlier work on the Aceh culture-based learning model (MPB2A), which

showed that integrating local cultural values with ICT-supported media can improve elementary students' science learning outcomes (Kasmini & Mardhatillah, 2020), and on values-based curricula that use family and community projects to cultivate shared values across different belief backgrounds (Hanafi et al., 2025).

Sustainability education in which pedagogical innovation, such as Eco-STEAM, edutainment and local wisdom is incorporated can overcome learning that only focuses on environmental knowledge. It provides space to integrate conceptual understanding, affective involvement, group activity and value reflection into a learning process. Yim et al. (2025) explain that research on STEAM in elementary schools still needs stronger learning design and assessment so that the benefits of disciplinary integration become more visible. Álvarez Ariza and Olatunde-Aiyedun (2024) also show that teacher readiness is important in ensuring that STEAM for sustainability does not remain only a discourse but appears in classroom practice. At the same time, Druker-Ibáñez and Cáceres-Jensen (2022) emphasise that local knowledge can broaden how schools understand sustainability as a cultural, social, and ecological issue. Therefore, this section positions Eco-STEAM, edutainment, and Mamayu Hayuning Bawana as mutually supportive pedagogical innovations: Eco-STEAM provides an interdisciplinary structure, edutainment provides learning engagement, and local wisdom provides value orientation. This framework forms the basis for the next section, which understands computational thinking as a systematic way of solving sustainability problems.

Taken together, the three bodies of work reviewed above show a consistent pattern: STEAM-for-sustainability research calls for stronger learning design and assessment (Yim et al., 2025), STEAM-for-sustainability implementation research calls for stronger teacher readiness (Álvarez Ariza & Olatunde-Aiyedun, 2024), and local-knowledge research calls for a clearer cultural-ethical grounding (Druker-Ibáñez & Cáceres-Jensen, 2022) — yet no single study in this literature reports a model that supplies all three simultaneously with an accompanying, validated cognitive-outcome instrument. This is the specific research gap this study addresses: an interdisciplinary, playfully engaging, and culturally grounded elementary-school model whose syntax is explicit enough to be used by teachers and whose cognitive effect on students (computational thinking) is measured with a validated instrument rather than asserted.

Computational Thinking as Sustainability Problem-Solving

This section positions computational thinking as a way of thinking that can help elementary students understand and respond to sustainability problems systematically. In sustainability education, environmental problems cannot always be solved by memorising concepts or following teacher instructions. Students must be taught to identify issues, recognise the difference between what is important

and unimportant information, understand the connections between factors and come up with appropriate actions to take. This way of thinking is in line with STEM-based problem-solving, which emphasises the importance of cross-disciplinary ways of thinking, such as critical thinking, systems thinking, modelling, and solution design, in dealing with complex problems (English, 2023). In project-based learning, computational thinking is also seen as an approach that can help students move from problem identification to solution planning through collaboration, visualisation, inquiry, and adequate scaffolding (Saad & Zainudin, 2024). Therefore, in this article, computational thinking is not understood as a narrow programming skill. It is understood as a reasoning strategy that helps manage complex environmental problems so that they become more structured and actionable.

From this perspective, computational thinking can serve as a bridge between sustainability education and problem-solving action. In the Eco-STEAM Edutainment model, students are not only invited to know that an environmental problem exists. They are also guided to trace how the problem is formed. This process begins with decomposition, in which students break down sustainability problems into smaller parts, such as causes, actors involved, sources of the problem, impacts, and possible actions. Students are then trained to recognise patterns, such as waste-disposal habits at certain times, repeated water use, or changes in plant conditions after different treatments. Research on computational thinking skills shows that these skills emerge in the problem-solving process when students use pattern recognition, representation, abstraction, and procedures to organise action (Lehmann et al., 2025). In science and programming education, strategies for integrating computational thinking also emphasise the importance of connecting scientific reasoning with systematic steps in formulating problems, processing information, and designing solutions (Yuana et al., 2025). Thus, computational thinking enables students to view sustainability problems as something that can be understood gradually rather than as large and abstract issues.

The Figure 1 shows that computational thinking in this article does not stand as a technical ability. It works as a thinking flow for understanding and responding to sustainability problems. The flow begins with real environmental problems that are close to students' lives. Students then decompose the problem, identify patterns, identify key information, and list action steps. At the end of the process, students reflect on whether the solution they designed shows care, responsibility, and harmony with the environment. In computing education, sustainability is increasingly seen as an important part of computing education because technology, data, and computational ways of thinking need to be connected with the social and ecological impacts of action (Peters et al., 2024). At the same time, frameworks for integrating sustainability into computing education emphasise the need to connect technical

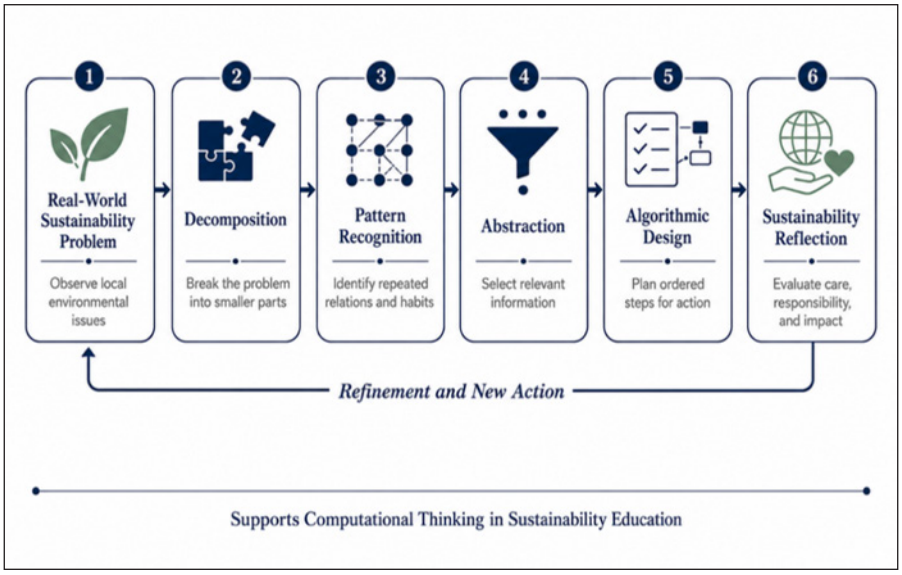

Figure 1. Computational thinking as sustainability problem-solving

problem-solving with values, ethics, social systems, and long-term impacts (Moreira et al., 2024). Thus, computational thinking can expand sustainability education from environmental awareness to more reflective thinking and action.

The application of computational thinking in solving sustainability problems in an elementary school context should be tailored to pupils' development. Problems will be close, concrete and observable for children. They also require assistance in the form of examples, prompting questions, visualisation, activity cards and group discussions to prevent their thinking from becoming limited to spontaneous responses. Research on computational thinking in primary and preschool children shows that this ability can be introduced through activities that do not always depend on computer programming but also through problem-solving tasks, structured games, and exploratory activities that help children understand sequence, pattern, and rules (Paraskevopoulou-Kollia, 2025). This is significant since issues of sustainability in elementary schools are not directly linked to digital solutions. They need to have a systematic approach to thinking. For instance, students may explore why some plants grow slower, why there's a buildup of waste in some places, or how easy it is to cut down on water's consumption in the classroom. Such activities create space for students to build decomposition, pattern recognition, abstraction, and action step design gradually.

This understanding forms the basis of the Eco-STEAM Edutainment model developed in this study. Eco-STEAM provides an interdisciplinary context for reading about environmental problems.

Edutainment provides enjoyable learning experiences that match children's world. Mamayu Hayuning Bawana gives value direction so that the solutions students develop are not only technically effective but also ecologically and socially responsible. In this framework, computational thinking functions as a thinking mechanism that connects these elements. Research on computational thinking and project-based learning confirms that the integration of both requires a clear design so that students not only produce products but also understand the thinking process used to solve problems (Saad & Zainudin, 2024). Work on STEM-based problem-solving also emphasises that interdisciplinary problem-solving requires a combination of systems thinking, design, modelling, and reflection on decisions (English, 2023). Therefore, this article uses computational thinking to understand how elementary students can move from observing environmental problems to designing sustainability solutions that are directed, collaborative, and value-based.

The selection of computational thinking as this study's primary measured outcome is not arbitrary: sustainability-education research has established that action competence requires structured reasoning (Torsdottir, Sinnes, et al., 2024), STEAM research has established that interdisciplinary activity needs clearer learning-outcome assessment (Yim et al., 2025), and computational thinking research has established indicators (decomposition, pattern recognition, abstraction, algorithmic design) that are well suited to capture exactly this kind of structured, cross-disciplinary reasoning (Tang et al., 2020; Wang et al., 2022) — yet, as noted above, no prior study has combined an Eco-STEAM/edutainment/local-wisdom design with a validated CT instrument in one elementary sustainability model. CT was therefore selected as the outcome measure because it is the construct for which validated, elementary-appropriate assessment tools already exist and because it operationalises, in a measurable way, the systematic reasoning that sustainability action requires.

METHODOLOGY

Through a research and development approach, this study developed an Eco-STEAM Edutainment model for sustainability learning in elementary schools. Specifically, this study examined how a learning model that combines environmental problems, Eco-STEAM activities, edutainment, Mamayu Hayuning Bawana values, and computational thinking can be designed, validated, and tested in elementary classroom contexts. A development approach was chosen because it is suitable for producing educational innovation that is not only built from theoretical reviews but is also tested through design, validation, revision, and limited implementation before wider use. This principle is in line with educational design research, which emphasises the relationship between developing practical solutions and contributing to theoretical understanding in educational practice (McKenney & Reeves, 2019). The model developed

in this study aims to help teachers use real environmental problems around the school as the starting point for learning. Its basic principle is to combine student engagement with sustainability problems and learning-objective achievement so that students experience learning that is conceptual, exploratory, collaborative, and reflective. Through needs analysis, product design, expert validation, readability testing, limited trials, and field testing, this study produced a set of learning tools that guided students through a systematic sustainability problem-solving process. Before presenting the findings, this section first explains the research context, participants, data, development procedures, and data analysis. Two nested frameworks were used to organise this development study, and both are stated explicitly here in response to reviewer feedback that the development framework needed to be named. At the macro level, the research procedure followed a modified Borg and Gall research-and-development cycle, simplified into six stages (needs analysis, model design, prototype development and expert validation, revision, readability testing and limited trial, and field testing), as described in the next subsection. At the level of the product itself, the pedagogical components of the resulting Eco-STEAM Edutainment model were organised following Joyce et al.'s (2015) Models of Teaching framework, which specifies five elements that any explicit instructional model should define: (1) syntax — the sequence of phases and activities that structures a lesson; (2) social system — the roles, authority relations, and norms of interaction between teacher and students; (3) principles of reaction — the ways teachers are expected to respond to, guide, and give feedback on student ideas and actions; (4) support system — the tools, materials, and resources required to run the model; and (5) instructional and nurturant effects — the direct learning outcomes the model targets and the indirect, longer-term effects it is expected to cultivate. This second framework is used in the Results section (Table 3) to describe what the Eco-STEAM Edutainment model actually is, prior to reporting the development process and outcomes. This development approach builds on the authors' prior experience producing validated elementary-level teaching materials through a comparable research-and-development process (Mardhatillah et al., 2019).

Research Context, Participants, and Data

The study was carried out in the classrooms of grade V in elementary schools in the area of East Java. This context is selected because students in Grade V already have the preliminary skills of reading a text-based problem, following step-by-step instructions, communicating with a group, and organising simple solutions in the problem. To get a more diverse picture, schools were selected purposefully taking into account teachers' readiness, school-environment characteristics and opportunities to use environmental problems as learning resources. Purposive selection

was used because this study needed contexts that were relevant to the purpose of model development, not merely random samples (Campbell et al., 2020). The environmental problems used in learning included issues close to students' lives, such as waste, classroom cleanliness, water use, school plants, and energy saving. The purpose of selecting these contexts was not to compare one school with another but to ensure that the model could be tested in learning situations close to students' real lives and sufficiently representative for examining implementation.

The participants consisted of Grade V students, classroom teachers, and expert validators. Students were involved in readability testing, limited trials, and field testing to determine how they understood the learning tools, followed the model syntax, and developed computational thinking during learning. Teachers were involved as model users and main informants to assess the clarity of the syntax, ease of using learning tools, suitability of activities for classroom conditions, and implementation challenges. Expert validators were also involved in assessing the feasibility of the model from the perspectives of elementary education, STEAM, educational technology, local culture, and learning evaluation. The involvement of these different participants was intended to ensure that the development data described not only the final product but also the pedagogical process that occurred when the model was implemented. This study involved 148 Grade V students from four intact classes across two public elementary schools in Malang Regency, East Java: two classes (n = 74) were assigned as the experimental group and two classes (n = 74) as the control group, following intact-class assignment rather than individual random assignment, which is typical of classroom-based R&D field testing. Four classroom teachers (two per school, one per class) implemented the learning sessions, and five expert validators — one specialist each in elementary education, STEAM/science education, educational technology and instructional media, Javanese local wisdom and cultural studies, and learning evaluation/assessment — validated the model, the learning tools, and the computational thinking instrument.

Data was collected from several sources. Qualitative data were obtained through classroom observations, teacher interviews, validator comments, field notes, and documentation of student activities. These data were used to understand the initial needs, implementation challenges, student engagement, and suggestions for improving the model. Quantitative data were obtained from expert validation scores, readability test results, observation sheets, teacher and student response questionnaires, and computational thinking tests. The use of both qualitative and quantitative data in development research allowed us to examine the product in terms of feasibility, practicality, and effectiveness more fully (Creswell & Creswell, 2018). All data were collected through procedures that considered educational research ethics. Teachers and schools were informed about the purpose of the study, the forms of participant involvement, and the use of the data. Student and school identities were protected in the analysis and reporting processes.

Development Procedure and Data Analysis

The development procedure was planned in a few steps. Initially, needs analysis was undertaken by conducting a literature review, initial observation, and teacher interviews during the first stage. This stage highlighted the conditions of environmental learning, the use of STEAM activities, and opportunities for edutainment, the relationship with the values of Mamayu Hayuning Bawana, and needs for the development of students' computational thinking. The second step was to design the model. In this stage, the conceptual framework, learning syntax, learning materials, media, student worksheets, activity cards, value reflection sheets, and assessment instruments were developed. The third phase was to develop the first prototype. Then, this prototype is tested by experts to be evaluated, and their suggestions are given for revision. The fourth stage was the revision of the product with validation feedback. The fifth stage was the "Readability Test and Limited Trial". The sixth stage was field testing to explore implementation, student responses, teacher responses, and the effectiveness of the model. These stages follow the logic of educational design research, which develops solutions through repeated cycles of analysis, design, evaluation, and revision (Nieveen & Folmer, 2013).

Data analysis focused on three themes—feasibility, practicality, and effectiveness. The mean scores and validity categories were used for the expert validation of data analysis. The aspects analysed were the clarity of the model rationale, the clarity of the environmental education and science-technology-engineering-arts-mathematics (Eco-STEAM) integration, the clarity of edutainment activity, the suitability of the value of Mamayu Hayuning Bawana, the appropriateness to elementary students, and the measurability of computational thinking indicators. Data on practicality measures were collected from three sources: readability tests, observation during classroom implementation, and teacher and student response questionnaires. The effectiveness data were analysed based on students' scores in pre-test and post-test computation skills in the field of computational thinking. The students' score improvement was analysed quantitatively while the qualitative analysis was used to explain the emergence of the improvement in the students' learning process.

Qualitative analysis was conducted through data reduction, data display, and conclusion drawing. Validator comments were grouped according to model components, such as syntax, learning tools, media, student worksheets, instruments, and value reflection. Observation results were used to determine how teachers implemented at each learning stage, how students responded to environmental problems, and how edutainment activities supported student engagement. Teacher interviews were used to understand the ease, challenges, and sustainability potential of model use. To increase trustworthiness, data from observations, questionnaires, tests, and interviews were compared through source and technique triangulation (Flick, 2018). In this way, the analysis not only produced validity and effectiveness scores but also showed how the Eco-STEAM Edutainment

model worked as a sustainability learning practice in elementary schools. The results of this process formed the basis for interpreting the findings in the next section, especially regarding initial needs, model design, classroom practice, validation, and the development of students' computational thinking.

Computational Thinking Assessment: Instrument, Rubric, and Validation

The computational thinking (CT) test used in this study was developed specifically for this model rather than adapted unmodified from an existing instrument, and its rubric was built directly on the four indicators that also structure the Eco-STEAM Edutainment model's syntax: decomposition, pattern recognition, abstraction, and algorithmic design (Wang et al., 2022). Each indicator was assessed through context-based items set in the same environmental problem scenarios used in learning (waste, water use, school plants, classroom cleanliness, and energy use), so that the test measured CT as applied to sustainability problem-solving rather than as an abstract or programming-specific skill, consistent with recommendations for assessing CT outside dedicated programming environments (Tang et al., 2020). The test consisted of 20 scenario-based items (five items per indicator), scored on a rubric ranging from 0 (no relevant response) to 5 (a complete, correctly sequenced, and well-justified response) per item, yielding an indicator score converted to a 0-100 scale for comparability with the descriptive statistics reported in the Results section. Table 2 summarises the rubric descriptors used to score each indicator. Content validity was established through expert judgment by the same panel of validators described above, using Aiken's V; items with $V \geq 0.78$ were retained, borderline items were revised, and no items fell below the retention threshold after one round of revision. Reliability was estimated during

Table 2
Computational thinking assessment rubric

Indicator	What the Indicator Measures	Illustrative Rubric Descriptor (per item, 0-5)	Score Range
Decomposition	Ability to break an environmental problem into its component parts (causes, actors, sources, impacts, possible actions)	0 = no breakdown attempted; 3 = partial breakdown with some parts correctly identified; 5 = complete, correctly organised breakdown of the problem into relevant parts	0-100 (5 items x 0-5, rescaled)
Pattern recognition	Ability to identify recurring patterns, habits, or regularities relevant to the problem (e.g., timing of waste accumulation, water-use habits)	0 = no pattern identified; 3 = a plausible but partially supported pattern; 5 = a clearly identified, evidence-based pattern with correct interpretation	0-100 (5 items x 0-5, rescaled)

Table 2 (*continued*)

Indicator	What the Indicator Measures	Illustrative Rubric Descriptor (per item, 0-5)	Score Range
Abstraction	Ability to filter relevant from irrelevant information and identify the core issue underlying the problem	0 = no filtering, all information treated as equally relevant; 3 = partial filtering with some irrelevant information retained; 5 = accurate filtering that isolates the core issue	0-100 (5 items x 0-5, rescaled)
Algorithmic design	Ability to arrange a logical, ordered sequence of action steps that responds to the problem	0 = no sequence or an illogical sequence; 3 = a mostly logical sequence with minor gaps; 5 = a complete, correctly ordered, and justified sequence of actions	0-100 (5 items x 0-5, rescaled)

Table 3
Elements of the Eco-STEAM Edutainment model (Joyce et al.'s, 2015, Models of Teaching framework)

Model Element	Description as Realised in the Eco-steam Edutainment Model
Syntax (phases of activity)	Phase 1 - Problem Orientation: teacher and students observe a real environmental problem at school (waste, water use, plants, cleanliness, or energy) using a trigger video, photo, or direct observation. Phase 2 - Eco-STEAM Exploration: students investigate the problem through science, technology, engineering, arts, and mathematics activities relevant to the problem (see Table 5). Phase 3 - Edutainment Challenge: students work in groups on a game-based task (mission cards, quizzes, simple simulations) that require them to apply what they explored in Phase 2. Phase 4 - Computational Reasoning: guided by worksheets and questions, students decompose the problem, identify patterns, abstract the core issue, and design an ordered sequence of actions (the four CT indicators). Phase 5 - Mamayu Hayuning Bawana Reflection: students evaluate their proposed solution against the five reflective questions in Table 7 (harmony, care, responsibility, cooperation, common good). Phase 6 - Action and Sharing: students present or enact their solution and record a short written or oral reflection on what they learned.
Social system (roles and authority relations)	The teacher acts as a facilitator and problem-poser rather than a lecturer: introducing the problem, managing group work, and posing reflective questions, while withholding ready-made answers. Students act as investigators and co-designers of solutions, working mostly in small groups (4-5 students) with rotating roles (observer, recorder, presenter). Authority is shared: students select and justify their own solutions, and the teacher's role is to probe reasoning rather than to correct outcomes directly.

Table 3 (*continued*)

Model Element	Description as Realised in the Eco-steam Edutainment Model
Principles of reaction (how the teacher responds)	The teacher responds to student ideas by asking clarifying and probing questions (e.g., "why do you think that pattern occurs?", "who is responsible if this step is skipped?") rather than supplying answers; incomplete reasoning is met with a follow-up question, not a correction; and the teacher explicitly links student answers back to the relevant CT indicator or Mamayu Hayuning Bawana value so students see the connection between their activity and the underlying thinking process.
Support system (resources and tools required)	A teacher's model guide and lesson modules; a student book; student worksheets and challenge/mission cards; trigger videos and photographs of the school environment; reflection sheets structured around the five Mamayu Hayuning Bawana questions; assessment rubrics (including the CT rubric in Table 2); and simple, low-cost materials already available in the school environment (waste samples, plants, water taps, measuring tools).
Instructional effects (direct, targeted outcomes)	Improved computational thinking (decomposition, pattern recognition, abstraction, algorithmic design) applied to environmental problem-solving; increased ability to translate an observed environmental problem into a structured, ordered action plan.
Nurturant effects (indirect, longer-term outcomes)	Growth in collaborative problem-solving habits, comfort with open-ended and exploratory tasks, and an ethical disposition toward the environment and shared life grounded in harmony, care, responsibility, cooperation, and the common good.

the limited trial using Cronbach's alpha, which reached an acceptable level for the total instrument and for each of the four indicator subscales. These results, together with the mean expert-validation score for the instrument (4.35, very valid; Table 8), indicate that the CT test used to generate the pretest-posttest data reported in the Results section met standard criteria for content validity and internal-consistency reliability before it was used for effectiveness testing.

RESULTS

This study identified six main findings related to the development and implementation of the Eco-STEAM Edutainment model in elementary schools. These findings show how the model responded to initial learning needs, turned environmental problems into learning contexts, integrated interdisciplinary and enjoyable activities, embedded Mamayu Hayuning Bawana as cultural reflection, and supported students' computational thinking. Data were obtained from a needs analysis, teacher interviews, expert validation, readability testing, classroom observations, student response questionnaires, and computational thinking tests. The six findings include:

The Eco-STEAM Edutainment Model: Structure and Syntax

Before reporting the development process and its outcomes, this subsection describes

what the Eco-STEAM Edutainment model based on Mamayu Hayuning Bawana actually is, using Joyce et al.'s (2015) five defining elements of an instructional model: syntax, social system, principles of reaction, support system, and instructional and nurturant effects.

This syntax was not designed in the abstract; it emerged from, and was subsequently validated against, the six-stage development process described in the Methodology and the field data reported below.

1. Identifying the initial needs for sustainability-oriented learning
2. Designing learning from environmental problems
3. Integrating Eco-STEAM and edutainment in classroom activities
4. Embedding Mamayu Hayuning Bawana in sustainability reflection
5. Validating and practicing the Eco-STEAM Edutainment model
6. Enhancing students' computational thinking through sustainability problem-solving

Table 4 summarises the findings, aspects of the model that emerged during implementation, and empirical indications obtained from the development process and field testing.

Table 4
Findings from implementing the Eco-STEAM Edutainment model

Finding	Emerging aspect of the Eco-STEAM Edutainment model	Empirical indication
1. Initial needs for sustainability-oriented learning	Need for contextual, environmental, and value-based learning	Learning was still dominated by teacher explanation, written exercises, and question-and-answer activities
2. Designing learning from environmental problems	Real environmental issues as the starting point of learning	Waste, water use, school plants, classroom cleanliness, and energy saving were used as learning contexts
3. Integrating Eco-STEAM and edutainment in classroom activities	Interdisciplinary exploration and enjoyable learning experiences	Students engaged in observation, group challenges, quizzes, solution design, and collaborative activities
4. Embedding Mamayu Hayuning Bawana in sustainability reflection	Local wisdom as ethical and cultural reflection	Students reflected on harmony, responsibility, cooperation, and environmental care
5. Validating and practicing the model	Expert validation, readability, practicality, and classroom implementation	Model validation = 4.48; tools = 4.44; readability = 89.27%; positive student response = 95.65%
6. Enhancing students' computational thinking	Sustainability problem-solving through decomposition, pattern recognition, abstraction, and algorithmic design	The experimental group increased from 52.68 to 82.41; N-Gain = 0.63; p = 0.000

Initial Needs for Sustainability-Oriented Learning

The first finding shows a need for learning that is more contextual, environmental, and oriented toward sustainability problem-solving. Initial observations showed that Grade V learning was still dominated by teacher explanations, examples, written exercises, and question-and-answer activities. Students were not consistently involved in identifying problems, collecting information, discussing causes, designing solutions, or reflecting the effects of their proposed ideas. Although teachers had used several learning media, these had not been specifically directed toward developing sustainability education and computational thinking.

This was supported by teacher interviews. Teachers were aware of the significance of environmental learning, application of technology in class, creativity, and local values. However, these ideas were difficult to translate into classroom practice without a clear model. Teachers needed learning syntax, ready-to-use teaching materials, structured student worksheets, supporting media, and assessment instruments that could guide them in implementing sustainability-oriented learning.

One teacher explained:

> *" Children are easily interested when learning is connected with the school environment, such as waste or plants. But we still need clear examples of learning steps, because when we only use an environmental theme, the lesson often returns to explanation and written exercises."*

Another teacher added:

> *"We understand that computational thinking is important; however, it is not easy to teach. Teachers need concrete activity examples, especially those suitable for elementary school students."*

This finding shows that the development of the Eco-STEAM Edutainment model started with real school needs. The model was not designed as a new learning label. It was designed as a structured response to teachers' needs to connect environmental problems, interdisciplinary exploration, enjoyable learning experiences, local wisdom, and computational thinking.

Designing Learning from Environmental Problems

The second finding concerns the use of environmental problems as the starting point of learning. In this model, learning did not begin with abstract definitions or textbook explanations, but with environmental issues that students could directly observe at school. The issues included waste accumulation, classroom cleanliness, water use, school-plant care, and energy saving.

At the design stage, these environmental problems were translated into teaching modules, student books, student worksheets, challenge cards, trigger videos, interactive quizzes, assessment rubrics, and reflection sheets. Each medium was designed to guide students from observation to analysis and

from analysis to solution design. Thus, the school environment did not only become the background of learning. It became an active learning resource.

Designing learning from environmental problems helped students connect sustainability issues with their thinking processes. For example, when students observed classroom waste, they were guided to break the problem down into sources of waste, locations, habits, impacts, and possible solutions. When students observed water use, they were guided to identify repeated patterns and arrange clear water-saving steps.

A teacher stated:

"The environmental problems selected were close to the students. The children did not need to imagine distant problems. They could directly see the trash bin, plants, and water taps at school."

This finding shows that environmental problems can become meaningful entry points for developing computational thinking when they are addressed through clear learning activities. The model helped students transition from simply noticing a problem to analysing it and designing a possible response.

Integrating Eco-STEAM and Edutainment in Classroom Activities

The third finding shows that the integration of Eco-STEAM and edutainment supported students' engagement in active and

Table 5
Environmental problems and learning design orientation

Environmental Problem	Learning Activity	Eco-STEAM Connection	Computational Thinking Focus
Waste in the classroom and schoolyard	Students observe types of waste and discuss their causes	Science: waste classification; Mathematics: counting waste frequency; Art: campaign poster	Decomposition and pattern recognition
Inefficient water use	Students identify water-use habits and propose saving steps	Science: water use; Technology: simple monitoring; Engineering: water-saving routines	Pattern recognition and algorithmic design
Poorly maintained school plants	Students compare plant conditions and arrange care schedules	Science: plant growth; Mathematics: observation table; Art: visual plant journal	Abstraction and algorithmic design
Classroom cleanliness	Students identify sources of untidiness and design classroom routines	Engineering: routine design; Social collaboration; Art: classroom-rules poster	Decomposition and algorithmic design
Energy use in the classroom	Students observe the use of lights/fans and create saving procedures	Science: energy; Technology: simple reminders; Mathematics: usage estimation	Pattern recognition and abstraction

meaningful learning. Eco-STEAM provides an interdisciplinary structure through science, technology, engineering, arts, and mathematics. Edutainment made the activities more accessible to elementary students through games, stories, quizzes, simple simulations, mission cards, and group challenges.

Observation data showed positive changes in student activity over five meetings. Problem-solving and solution-design activities increased from 30.24% in the first meeting to 38.12% in the fifth meeting. Discussions with peers and teachers increased from 22.18% to 25.72%. In contrast, irrelevant behaviour decreased from 4.85% to 0.57% (Table 6).

The change in activity patterns showed that students gradually became more involved in learning tasks that required exploration, discussion, and solution design. In the first meeting, the students still needed considerable teacher guidance. In later meetings, they were more able to read environmental problems, divide group tasks, formulate strategies, and connect solutions with sustainability values.

One student stated in reflection:

"I liked it because learning felt like a challenge. We saw problems in the classroom and then looked for ways to make the class cleaner."

Another student added:

"Usually, environmental learning is only reading, but this time we made a plan and discussed it with friends."

With the responses it is clear that edutainment did not serve as additional entertainment. It turned into a pedagogical approach to engage students in more complex thinking processes. Student challenges, missions, and visual media were used to encourage them to observe, discuss, and refine solutions

Embedding Mamayu Hayuning Bawana in Sustainability Reflection

The fourth finding concerns the embedding of Mamayu Hayuning Bawana in sustainability reflection. In this model, Mamayu Hayuning Bawana was not treated as a standalone

Table 6
Percentage of student activities during learning

Student Activity	Meeting 1	Meeting 2	Meeting 3	Meeting 4	Meeting 5
Paying attention to the teacher or peers	17.85	15.42	13.16	11.74	10.68
Reading and understanding environmental problems	11.36	12.58	13.27	13.94	14.10
Solving problems and designing solutions	30.24	33.76	35.81	37.25	38.12
Discussing with peers and the teacher	22.18	23.45	24.36	25.08	25.72
Drawing conclusions and reflecting on local values	13.52	12.96	11.89	11.03	10.81
Irrelevant behaviour	4.85	1.83	1.51	0.96	0.57

cultural topic. It was used as a reflective framework that guided students to assess whether the solutions they designed reflected harmony, care, responsibility, cooperation, and balance in the relationship between humans and the environment.

This value was conveyed through reflection sheets, teacher questions, and discussions after solution design activities. After the students arranged their solutions, they were invited to consider several questions: Does this solution help protect the environment? Does it involve cooperation? Does it benefit others? Does it show responsibility for shared life? Through this reflection process, sustainability learning became not only technical but also ethical and cultural.

Students' positive responses to Mamayu Hayuning Bawana's reflection reached 91.89%. This indicates that most students understand the relationship between environmental problem-solving and the values of harmony, responsibility, and care.

A teacher explained:

"The value of Mamayu Hayuning Bawana helped students understand that environmental solutions are not only about right or wrong, but also about maintaining balance and taking shared responsibility."

A student wrote in the reflection sheet,

"If we take care of plants and do not throw waste carelessly, the school becomes more comfortable, and all friends feel the benefits."

This finding shows that local wisdom can function as a reflective framework for sustainability education. Mamayu Hayuning Bawana gives cultural meaning to environmental problem-solving and helps students evaluate solutions using ethical and social considerations.

Validating and Practicing the Eco-STEAM Edutainment Model

The fifth finding concerns the model's validity and practicality. Expert validation showed that the learning model obtained an

Table 7
Embedding Mamayu Hayuning Bawana in learning reflection

Value Dimension	Classroom Reflection Question	Expected Student Response
Harmony	Will this solution help create a better relationship between humans and nature?	Students consider environmental balance
Care	Does this solution care for the school environment?	Students connect action with environmental care
Responsibility	Who is responsible for implementing this solution?	Students recognise shared responsibility
Cooperation	Can this solution be implemented alone, or does it require cooperation?	Students understand the importance of group action
Common good	Who benefits from this solution?	Students consider social and environmental impact

average score of 4.48, which was categorised as very valid. The highest score was found in the integration of Mamayu Hayuning Bawana, which was 4.62. This result shows that the cultural value component was clearly represented in the model.

Learning tool validation and computational thinking test validation received average scores of 4.44, and 4.35, respectively. Both were in very valid category. The readability test was obtained with a score of 89.27% which indicates that the student book, student worksheet, visual instructions, and the flow of activity could be understood by students and teachers.

Teachers' ability to manage learning increased across meetings. The average score increased from 3.91 in the first meeting to 4.70 in the fifth meeting (Table 9). This shows that teachers became more able to manage environmental problem orientation, Eco-STEAM exploration, edutainment challenges, computational thinking guidance, and Mamayu Hayuning Bawana reflection.

The student response questionnaire showed that students responded positively to the learning implementation (Table 10). The highest responses were in the classroom atmosphere and edutainment challenges,

Table 8
Summary of model validation and practicality results

Aspect	Result	Category
Learning model validation	4.48	Very valid
Learning-tool validation	4.44	Very valid
Computational thinking test validation	4.35	Very valid
Readability test	89.27%	Very good
Positive student response	95.65%	Very good
Teacher classroom management	4.37	Very good
N-Gain of experimental group	0.63	Moderate
Paired sample t-test	p = 0.000	Significant
Independent sample t-test	p = 0.000	Significant

Table 9
Teacher's ability to manage learning

Observed aspect	M1	M2	M3	M4	M5
Communicating learning objectives	4.10	4.30	4.50	4.60	4.70
Motivating students	4.00	4.35	4.45	4.65	4.75
Orienting students to Eco-STEAM problems	3.95	4.25	4.55	4.70	4.80
Managing edutainment activities	3.80	4.15	4.35	4.55	4.65
Guiding computational thinking	3.85	4.20	4.48	4.68	4.76
Integrating Mamayu Hayuning Bawana	3.90	4.22	4.44	4.61	4.72
Managing learning time	3.70	4.05	4.25	4.40	4.55
Conducting evaluation and reflection	3.95	4.25	4.50	4.63	4.70
Mean	**3.91**	**4.22**	**4.44**	**4.60**	4.70

Table 10
Student responses to learning implementation

Assessed Aspect	Positive Rresponse	Negative Response
Learning material	95.95%	4.05%
Student book	94.59%	5.41%
Student worksheets	97.30%	2.70%
Classroom atmosphere	98.65%	1.35%
Teacher's way of teaching	95.95%	4.05%
Eco-STEAM activities	94.59%	5.41%
Edutainment challenges	98.65%	1.35%
Mamayu Hayuning Bawana reflection	91.89%	8.11%
Interest in similar learning activities	97.30%	2.70%

Table 11
Descriptive statistics of computational thinking scores

Group	N	Test	Minimum	Maximum	Mean	SD
Experimental	74	Pretest	38	69	52.68	7.14
Experimental	74	Posttest	67	96	82.41	6.83
Control	74	Pretest	37	68	51.94	7.28
Control	74	Posttest	55	84	68.17	7.06

both reaching 98.65%. The lowest positive response was in the reflection on Mamayu Hayuning Bawana, which reached 91.89%, but it was still in the very good category.

These results show that the model was not only conceptually valid but also practical for use in the classroom. Teachers might use the learning syntax with only minor adaptations such as providing more examples of expected responses, making the instructions easier on student's worksheet, and adding examples of expected responses.

Enhancing Students' Computational Thinking through Sustainability Problem-Solving

The sixth finding concerns students' CT results. The computational thinking test was administered before and after the learning sessions. The test measured four indicators: decomposition, pattern recognition, abstraction, and algorithmic design.

Descriptive statistics showed that the experimental group increased from 52.68 in the pre-test to 82.41 in the post-test (Table 11). The control group also increased, but at a lower level, from 51.94 to 68.17. The experimental group increased by 29.73 points, whereas the control group increased by 16.23 points. This result shows that the Eco-STEAM Edutainment model produced a stronger improvement than regular instruction.

Indicator analysis showed improvement in all computational thinking components (Table 12). Decomposition increased from 53.10% to 84.02%. Pattern recognition increased from 52.34% to 82.76%.

Abstraction increased from 50.85% to 79.88%. Algorithmic design increased from 54.43% to 83.01%. Among the four indicators, abstraction obtained the lowest post-test score. This suggests that selecting important information remains challenging for elementary students.

The effectiveness test strengthened this finding. The paired sample t-test showed a significant difference between the pretest and posttest scores in the experimental group ($p = 0.000$). The independent sample t-test also showed a significant difference between the experimental and control groups' posttest scores ($p = 0.000$). The N-gain score of the experimental group was 0.63, while that of the control group was 0.34.

One teacher reflected:

> *"The children understood the steps for solving problems more easily when the problems were visible to them. They did not only answer questions; they tried to arrange the sequence of actions."*

One student also explained the following:

> *"When the problem was too big, we broke it down first. For example, with waste in the classroom, we looked at where it came from, when it was most common, and then made group rules."*

This finding shows that computational thinking can be meaningfully developed through sustainability problem-solving. The model helped students transition from observing environmental problems to breaking down problems, recognising patterns, selecting important information, and designing ordered action steps. In this context, computational thinking is not viewed as a separate technical skill. Rather, it has become a thinking tool in sustainability learning.

Table 12
Mean scores of computational thinking indicators in the experimental group

Indicator	Pretest	Posttest	Gain
Decomposition	53.10	84.02	30.92
Pattern recognition	52.34	82.76	30.42
Abstraction	50.85	79.88	29.03
Algorithmic design	54.43	83.01	28.58
Total mean	**52.68**	**82.41**	29.73

Overall, the results indicate that the Eco-STEAM Edutainment model was effective, which occurred via three interconnected pathways. First, the model puts environmental issues at the start of learning. Secondly, it facilitated interdisciplinary exploration via fun and cooperative activities. Thirdly, it helped students to reflect on solutions using Mamayu Hayuning Bawana. These pathways enabled students to enhance their computational thinking skills and also gain awareness of the nature of environmental issues as ones that need knowledge, action, care, and a sense of responsibility

DISCUSSION AND CONCLUSION

Based on the results of this study, the Eco-STEAM Edutainment model can be explained as a pedagogical innovation that combines the concepts of sustainability education, interdisciplinary learning, and fun learning experiences with the local

wisdom and computational thinking in one learning model in elementary school. It is important to note that this model is not meant to supplant the current classroom practices of teachers in their entirety. It is important to note that this model is not a quick way to completely replace teachers' current classroom practices. Instead, it is seen as providing a structure that guides teachers to move from the dominant teaching approach of providing explanations and written assignments to more contextual, exploratory, and reflective learning experiences. In this study, environmental problems close to students' lives became a starting point that helped teachers connect learning with real experience. This finding is in line with research on sustainability education, which emphasises that the success of ESD implementation is not determined only by the content taught, but also by teacher readiness, pedagogical design, and learning experiences that allow students to understand sustainability issues as part of their lives (Dittrich et al., 2024). The model also indicates that the concept of environmental learning in elementary schools should be conceived as a process of learning, of something more than just concept delivery. Therefore, the first contribution of this study is to demonstrate the implementation of the learning that provides students with opportunities to observe, question, design solutions and reflect on their responsibility for the environment.

The results also indicate that the combination of the concepts of Eco-STEAM and edutainment can enhance students' involvement in sustainability learning. The amount of student activities connected to problem-solving and solution design was higher in the fifth meeting than in the first meeting, and the amount of irrelevant behaviour decreased in each meeting. This implies that students can learn with real problems in their environment, interdisciplinary activities, and fun challenges to keep them busy in more advanced thinking. This is significant because sustainability learning can be challenging when environmental material is introduced in a normative manner, such as by offering suggestions on what to do to make the classroom sustainable. In Eco-STEAM Edutainment, students were not only requested to “learn” good behaviour, they also were asked to know the reasons for a problem occurring, to learn how patterns of problems would manifest, and to know what steps might be taken. Research on sustainability education and learning processes shows that learning that connects concepts, connections, creativity, and community can strengthen the quality of students' learning experiences (Brandt et al., 2021). In this article, edutainment provided a learning form that matched children's world, while Eco-STEAM provided an interdisciplinary structure so that learning still had a clear academic direction. The combination made learning more engaging without losing its orientation toward understanding and sustainability of action. This is consistent with the authors' earlier findings that a well-implemented internet-based learning strategy can strengthen

students' engagement with course content (Ananda et al., 2023), and that students' emotional engagement is itself associated with better learning outcomes, including in mathematics (Jalaluddin et al., 2020).

The results further show that Mamayu Hayuning Bawana served as a bridge between environmental problem-solving and value formation. This value helped students assess solutions not only based on technical feasibility but also on care, cooperation, responsibility, and harmony with the environment. This point is important because sustainability education cannot be separated from ethical and social dimensions. If students are only asked to design environmental solutions without reflecting the values behind their actions, learning can become too technical and lose its meaning. In this study, Mamayu Hayuning Bawana reflection gave students space to ask whether their proposed actions were beneficial for the environment and shared life. This finding is consistent with research on local wisdom integration in environmental education, which shows that cultural knowledge and values can strengthen the connection among learning, social identity, and sustainability behaviour (Sihombing et al., 2025). Therefore, the model shows that local wisdom does not need to be positioned as a cultural ornament. It can become a source of reflection in sustainability education. The principle of Mamayu Hayuning Bawana also has transferability because harmony, care, and ecological responsibility can be found in many other cultures, even if the terms and practices differ. This finding is also the study's main evidence bearing on the question of environmental-ethical awareness raised in the Introduction. The 91.89% positive response rate to the Mamayu Hayuning Bawana reflection (Table 7), together with the qualitative excerpts above, shows that students were not only completing the cognitive steps of Eco-STEAM exploration; they were also engaging, and largely agreeing with, the value-based questions used to evaluate their own solutions. Because this was measured through a response questionnaire and reflection-sheet coding rather than a standardised, validated environmental-attitude or pro-environmental-behaviour scale, it is reported here as descriptive, complementary evidence of the model's function rather than as a confirmatory test of environmental-awareness gain; a validated instrument for that specific construct is identified as a direction for future research below. What the data do allow us to say with more confidence is the point raised in the Introduction about redundancy: the results on student activity (Table 6) show students becoming more capable at the cognitive-interdisciplinary steps of a solution through Eco-STEAM, while this finding shows students separately engaging an evaluative, values-based judgment about that same solution through Mamayu Hayuning Bawana — two distinguishable processes operating on the same problem, not one process measured twice.

From a computational thinking perspective, this study shows that students'

abilities improved after learning through the Eco-STEAM Edutainment model. Improvement occurred in decomposition, pattern recognition, abstraction, and algorithmic design. This result shows that computational thinking can be developed through sustainability problems, not only through programming or coding lessons. When students observed classroom waste, water use, plant care, or energy saving, they were actually learning to break down problems, recognise patterns, select important information, and arrange action steps. This finding supports the view that computational thinking at the elementary level can be developed through unplugged, visual, and problem-based activities that are close to students' lives (Curi et al., 2025). However, our findings also show that abstraction received the lowest score compared with the other indicators. This is understandable because abstraction requires students to filter information, set priorities, and distinguish the core problem from additional information. Future implementation therefore needs stronger learning support, such as information maps, guiding questions, visual organisers, and gradual examples. Thus, the second contribution of this study is to broaden the understanding of computational thinking as a way of thinking for responding to sustainability problems systematically and responsibly. Abstraction receiving the lowest post-test score among the four indicators (79.88, against 82-84 for the others; Table 12) is worth discussing its own terms rather than only noting in passing. Abstraction, in this test, required students to filter relevant from irrelevant information and isolate the core issue — a demand that is cognitively heavier than decomposing a problem into parts or sequencing already-identified steps, and one that other elementary CT research has also found to be the most difficult of the standard CT indicators for this age group. This suggests that the gap is a feature of the construct's developmental difficulty rather than a defect specific to the model's Phase 4 (Computational Reasoning) activities (Table 3). This is consistent with the authors' own findings on natural number bias among Indonesian elementary students, which show that young learners' abstraction and generalisation processes are systematically constrained by their existing conceptual schemas and therefore require deliberate instructional support to overcome (Rahayuningsih et al., 2025b).

Practically, this study shows that the success of the model was strongly influenced by teachers' readiness to manage learning syntax, group activities, edutainment, and value reflection. The increase in teachers' ability to manage learning from the first to the fifth meeting shows that this model can be learned and practiced gradually. However, this increase also shows that teachers need time to adapt. Teachers do not only need to understand the steps of the model. They also need to become familiar with managing learning that is more open, collaborative, and problem-based. This is in line with research on teacher development for computational thinking, which emphasises the importance of teacher development

programs that connect content knowledge, pedagogy, technology, and classroom practice (Kong, 2023). In the context of Eco-STEAM edutainment, support for teachers needs to include examples of teaching materials, guiding questions, activity scenarios, assessment rubrics, and examples of value reflection. With this kind of support, the model has the potential to be implemented not only in one theme or one school but also in other learning contexts that use local environmental problems as the starting point. The steady increase in teachers' classroom-management scores across five meetings (Table 9) also indicates that the model's syntax (Table 3) is learnable through practice rather than dependent on specialised prior training. Practically, this suggests that the model's success is contingent on giving teachers structured support — the guide, modules, and rubrics listed as the support system in Table 3 — during an adjustment period, rather than assuming the syntax can be implemented correctly from a single reading.

Although this study showed positive results, several limitations must be addressed. First, the model was tested in Grade V elementary school contexts. Its application in lower grades, secondary schools, or areas with different environmental characteristics requires adjustment. Second, Mamayu Hayuning Bawana originated from a specific local cultural context; therefore, its implementation in other regions must be aligned with local values in those communities. Third, this study emphasised short-term outcomes, including validity, practicality, student responses, and improvements in computational thinking. Further research should examine the long-term effects of the model on students' environmental behaviour. Fourth, abstraction still requires stronger support in activity design. These limitations do not reduce the contribution of the model; however, they show that Eco-STEAM Edutainment development should be viewed as a process that can continue to be refined. Research on computational thinking assessment also emphasises that measuring this ability requires instruments that are clear, reliable, and sensitive to different learning contexts (Tang et al., 2020). Therefore, future research can expand field testing, strengthen assessment, and develop more adaptive supporting tools. Fifth, this study measured validity, practicality, student and teacher responses, and CT effectiveness using an experimental-control field test; it did not employ a separately validated environmental-awareness or pro-environmental-behaviour scale, and its evidence on environmental-ethical awareness (discussed above) is therefore descriptive rather than confirmatory. Future studies should incorporate such a validated instrument alongside the CT test so that the model's effect on ecological attitudes and behaviour can be measured directly rather than inferred from reflection responses.

Overall, this study concludes that the Eco-STEAM Edutainment model grounded in Mamayu Hayuning Bawana is feasible as a sustainability learning approach in elementary schools. The model

showed high validity, classroom practicality, positive student responses, and effectiveness in improving computational thinking. The main contribution of this study is the integration of four elements that are often discussed separately: sustainability education, Eco-STEAM, edutainment, and local wisdom. The model shows that school environmental problems can become rich learning spaces, that enjoyable activities can still be directed toward serious thinking goals, and that local values can provide ethical depth to problem-solving. The implication is that elementary teachers can use simple environmental problems as a starting point for interdisciplinary learning. Schools can also support the implementation of the model by providing space, time, and a school culture that strengthens sustainability practices. Further studies are recommended to test this model in other cultural contexts, develop digital or hybrid versions, and evaluate its impact on sustainability competence, collaboration, creativity, and students' ecological behaviour. The main contribution of this study is therefore twofold. Theoretically, it integrates four elements that are often discussed separately in the literature — sustainability education, Eco-STEAM, edutainment, and local wisdom — into one explicit, replicable instructional model, described through its syntax, social system, principles of reaction, support system, and instructional and nurturant effects (Table 3), rather than only through the process used to produce it. Practically, it demonstrates that a specific local value system can provide ethical depth to problem-solving without duplicating the cognitive work already carried out through Eco-STEAM.

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REFERENCES

Aka, K. A., Setyosari, P., Purwaningsih, E., & Mardhatillah. (2025). Meta-analysis of integrated learning on 21st century skills: Is integrated learning still relevant? *European Journal of Educational Research, 14*(2), 625-643. https://doi.org/10.12973/eu-jer.14.2.625

Álvarez Ariza, J., & Olatunde-Aiyedun, T. G. (2024). A systematic literature review on STEAM pre- and in-service teacher education for sustainability: Are teachers ready? *Eurasia Journal of Mathematics, Science and Technology Education, 20*(9), Article em2498. https://doi.org/10.29333/ejmste/14982

Ananda, R., Rafida, T., & Mardhatillah. (2023). The guidance website: Internet strategy implementation at the university in industrial 4.0 content. *International Journal of Innovative Research and Scientific Studies, 6*(2), 227-234. https://doi.org/10.53894/ijirss.v6i2.1242

Brandt, J.-O., Barth, M., Merritt, E., & Hale, A. (2021). A matter of connection: The 4 Cs of learning in pre-service teacher education for sustainability. *Journal of Cleaner Production, 279*, Article 123749. https://doi.org/10.1016/j.jclepro.2020.123749

Campbell, S., Greenwood, M., Prior, S., Shearer, T., Walkem, K., Young, S., Bywaters, D., & Walker,

K. (2020). Purposive sampling: Complex or simple? Research case examples. *Journal of Research in Nursing, 25*(8), 652-661. https://doi.org/10.1177/1744987120927206

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications.

Curi, M. E., Gerosa, A., Viera, M., & Carboni, A. (2025). A review of computational thinking interventions in upper elementary education. *Computers and Education Open, 9*, Article 100252. https://doi.org/10.1016/j.caeo.2025.100252

Dittrich, A. K., Laessøe, J., & Jónsson, Ó. P. (2024). Challenges of implementing education for sustainable development in teacher education. *Journal of Education for Sustainable Development, 18*(2), 237-256. https://doi.org/10.1177/09734082241309704

Druker-Ibáñez, S., & Cáceres-Jensen, L. (2022). Integration of Indigenous and local knowledge into sustainability education: A systematic literature review. *Environmental Education Research, 28*(8), 1209-1236. https://doi.org/10.1080/13504622.2022.2083081

Dubois, E., Farolfi, S., Hafkamp-Ibanez, L., & Roussel, S. (2025). Environmental edutainment games and pro-environmental behaviour of primary school students: Evidence from a field experiment. *Journal of Behavioural and Experimental Economics, 119*, Article 102474. https://doi.org/10.1016/j.socec.2025.102474

English, L. D. (2023). Ways of thinking in STEM-based problem solving. *ZDM Mathematics Education, 55*(7), 1219-1232. https://doi.org/10.1007/s11858-023-01474-7

Erawan, G. M., Mariana, N., & Suryanti, S. (2025). Development and challenges of STEAM learning implementation in elementary schools: A comprehensive literature review. *International Journal of Emerging Research and Review, 3*(1), 94. https://doi.org/10.56707/ijoerar.v3i1.94

Finnegan, W. (2023). Beyond whole-school approaches to sustainability: Social practices and practice architectures at secondary schools in England. *Energy Research & Social Science, 102*, Article 103186. https://doi.org/10.1016/j.erss.2023.103186

Flick, U. (2018). *An introduction to qualitative research* (6th ed.). SAGE Publications.

Gericke, N., & Torbjörnsson, T. (2022). Identifying capital for school improvement: Recommendations for a whole school approach to ESD implementation. *Environmental Education Research, 28*(6), 803-825. https://doi.org/10.1080/13504622.2022.2045256

Giannakoulas, A., & Xinogalos, S. (2024). Studying the effects of educational games on cultivating computational thinking skills to primary school students: A systematic literature review. *Journal of Computers in Education, 11*(4), 1283-1325. https://doi.org/10.1007/s40692-023-00300-z

Hanafi, Y., Saefi, M., Diyana, T. N., ... Mardhatillah, & Mustakim, S. S. (2025). Multi-faith partner programme through family project: Navigating students with the Lakum Dinukum Waliyadin curriculum. *Journal of Beliefs and Values*. Advance online publication.

Huencho, A., & Chandía, E. (2023). Humanizing mathematics education: Quantitative and arithmetic argumentation of indigenous cultural practices. *ZDM Mathematics Education, 55*(6), 1085-1099. https://doi.org/10.1007/s11858-023-01490-7

Jalaluddin, Mardhatillah, Silaban, P. J., Sari, S. M., & Setiawan, D. (2020). The effect of emotional intelligence on the results of learning mathematics in students elementary school. *Advances in Mathematics: Scientific Journal, 9*(12), 10577-10582.

Johnston, K., Kervin, L., & Wyeth, P. (2022). STEM, STEAM and makerspaces in early childhood: A scoping review. *Sustainability, 14*(20), Article 13533. https://doi.org/10.3390/su142013533

Joyce, B., Weil, M., & Calhoun, E. (2015). *Models of teaching* (9th ed.). Pearson.

Kasmini, L., & Mardhatillah. (2020). The influence of Aceh culture-based learning model (MPB2A) integrated media information communication and technology on student learning outcomes in science learning. *International Journal of Advanced Science and Technology, 29*(5), 2051-2058.

Kasmini, L., Mardhatillah, & Prayudi, S. (2024). The impact of a gender mainstreaming-based blended learning flipped classroom model on the solidarity values and problem-solving abilities of students. *International Journal of Innovative Research and Scientific Studies, 7*(1), 226-239.

Kong, S.-C. (2023). Effects of a teacher development program on teachers' knowledge and collaborative engagement, and students' achievement in computational thinking concepts. *British Journal of Educational Technology, 54*(2), 489-512. https://doi.org/10.1111/bjet.13256

Krathwohl, D. R. (2002). A revision of Bloom's taxonomy: An overview. *Theory Into Practice, 41*(4), 212-218. https://doi.org/10.1207/s15430421tip4104_2

Lehmann, T. H., Gervasoni, A., & Beswick, K. (2025). Examining the interaction of computational thinking skills throughout the problem-solving process. *Research in Mathematics Education*. https://doi.org/10.1080/14794802.2025.2460460

Lin, C.-L., & Tsai, C.-Y. (2021). The effect of a pedagogical STEAM model on students' project competence and learning motivation. *Journal of Science Education and Technology, 30*(1), 112-124. https://doi.org/10.1007/s10956-020-09885-x

Liu, Z., Gearty, Z., Richard, E., Orrill, C. H., Kayumova, S., & Balasubramanian, R. (2024). Bringing computational thinking into classrooms: A systematic review on supporting teachers in integrating computational thinking into K-12 classrooms. *International Journal of STEM Education, 11*, Article 51. https://doi.org/10.1186/s40594-024-00510-6

Mardhatillah, Khotimah, K., Sari, Z. N., ... Huzaimah, C., & Diana, I. N. (2026). Digitally mediated problem-based learning integrating Aneuk Jamee cultural values to enhance computational thinking and cultural identity in primary education. *Pertanika Journal of Social Sciences and Humanities, 34*(1), 415-447.

Mardhatillah, Kasmini, L., Yusrizal, ... Rambe, T., & Yasrizal. (2020). The influence of information technology and communication technology (ICT)-based learning media on student learning outcomes in mathematics learning in elementary school. *Advances in Mathematics: Scientific Journal, 9*(12), 10569-10576.

Mardhatillah, Sari, S. M., Surjono, H. D., & Muhtadi, A. (2019). Development of teacher and student thematic learning books based on gender and diversity for elementary school students in district of Aceh Barat. *International Journal of Scientific and Technology Research, 8*(10), 896-898.

McKenney, S., & Reeves, T. C. (2019). *Conducting educational design research* (2nd ed.). Routledge. https://doi.org/10.4324/9781315105642

Montuori, C., Gambarota, F., Altoè, G., & Arfé, B. (2024). The cognitive effects of computational thinking: A systematic review and meta-analytic study. *Computers & Education, 210*, Article 104961. https://doi.org/10.1016/j.compedu.2023.104961

Moreira, A., Leifler, O., Betz, S., Brooks, I., Capilla, R., Coroama, V. C., Duboc, L., Fernandes, J. P., Heldal, R., Lago, P., Nguyen, N.-T., Oyedeji,

S., Penzenstadler, B., Peters, A.-K., Porras, J., & Venters, C. C. (2024). A road less travelled and beyond: Towards a roadmap for integrating sustainability into computing education. *Proceedings of the 2024 ACM Conference on Software Engineering Education and Training*. https://doi.org/10.1145/3661167.3661217

Nieveen, N., & Folmer, E. (2013). Formative evaluation in educational design research. In T. Plomp & N. Nieveen (Eds.), *Educational design research* (pp. 152-169). SLO.

Orey, D. C., & Rosa, M. (2022). Rethinking ethnomathematics in contemporary classrooms: Culture, power, and mathematical knowing. *ZDM Mathematics Education, 54*(6), 1191-1204. https://doi.org/10.1007/s11858-022-01363-4

Paraskevopoulou-Kollia, E.-A. (2025). Computational thinking in primary and pre-school children. *Education Sciences, 15*(8), Article 985. https://doi.org/10.3390/educsci15080985

Peters, A.-K., Capilla, R., Coroamă, V. C., Heldal, R., Lago, P., Leifler, O., Moreira, A., Fernandes, J. P., Penzenstadler, B., Porras, J., & Venters, C. C. (2024). Sustainability in computing education: A systematic literature review. *ACM Transactions on Computing Education, 24*(1), Article 13. https://doi.org/10.1145/3639060

Quigley, C. F., Herro, D., King, E., & Plank, H. (2020). STEAM designed and enacted: Understanding the process of design and implementation of STEAM curriculum in an elementary school. *Journal of Science Education and Technology, 29*(4), 499-518. https://doi.org/10.1007/s10956-020-09832-w

Rahayuningsih, S., Anggriani, A. E., Mardhatillah, ... Yuniawatika, & Kamarudin, N. Z. S. (2025a). The relationship between cognitive flexibility and mathematical literacy: Insights from Indonesian elementary students. *International Electronic Journal of Elementary Education, 17*(3), 367-381.

Rahayuningsih, S., Anggriani, A. E., Mardhatillah, ... Hasan, A., & Ikram, M. (2025b). Examining natural number bias processes in elementary school students: A case study in Indonesia. *Multidisciplinary Science Journal, 7*(8), Article e2025381.

Rodrigues-Silva, J., & Alsina, Á. (2023). STEM/STEAM in early childhood education for sustainability (ECEfS): A systematic review. *Sustainability, 15*(4), Article 3721. https://doi.org/10.3390/su15043721

Rodríguez-Nieto, C. A., & Alsina, Á. (2022). Networking between ethnomathematics, STEAM education, and the globalized approach to analyse mathematical connections in daily practices. *Eurasia Journal of Mathematics, Science and Technology Education, 18*(3), Article em2085. https://doi.org/10.29333/ejmste/11710

Saad, A., & Zainudin, S. (2024). A review of teaching and learning approach in implementing project-based learning (PBL) with computational thinking (CT). *Interactive Learning Environments, 32*(10), 7622-7646. https://doi.org/10.1080/10494820.2024.2328280

Sihombing, R. A., Harahap, F., & Sari, R. M. (2025). Integrating local wisdom into environmental education: A systematic review of ethnoscience research in Indonesia. *Journal of Natural Science and Integration, 8*(1), 1-18. https://doi.org/10.24014/jnsi.v8i1.35762

Tabaru Örnek, G., & Yel, S. (2025). A place-based practice in primary school: Effects on environmental literacy. *Journal of Adventure Education and Outdoor Learning, 25*(3), 692-718. https://doi.org/10.1080/14729679.2024.2366922

Tang, X., Yin, Y., Lin, Q., Hadad, R., & Zhai, X. (2020). Assessing computational thinking: A systematic review of empirical studies. *Computers & Education, 148*, Article 103798. https://doi.org/10.1016/j.compedu.2019.103798

Torsdottir, A. E., Olsson, D., Sinnes, A. T., & Wals, A. (2024a). Do school experiences in influencing society matter? Student participation and action competence for sustainability. *Global Environmental Change, 87*, Article 102875. https://doi.org/10.1016/j.gloenvcha.2024.102875

Torsdottir, A. E., Olsson, D., Sinnes, A. T., & Wals, A. (2024b). The relationship between student participation and students' self-perceived action competence for sustainability in a whole school approach. *Environmental Education Research*. https://doi.org/10.1080/13504622.2024.2326462

Torsdottir, A. E., Sinnes, A. T., Olsson, D., & Wals, A. (2024). Do students have anything to say? Student participation in a whole school approach to sustainability. *Environmental Education Research, 30*(4), 519-543. https://doi.org/10.1080/13504622.2023.2213427

Van Poeck, K., Lidar, M., Lundqvist, E., & Östman, L. (2025). When teaching habits meet educational innovation: Problematic situations in the implementation of sustainability education through open schooling. *Environmental Education Research, 31*(3), 605-626. https://doi.org/10.1080/13504622.2024.2405889

Vesterinen, M., & Ratinen, I. (2024). Sustainability competences in primary school education: A systematic literature review. *Environmental Education Research, 30*(1), 56-67. https://doi.org/10.1080/13504622.2023.2170984

Wagiran, W. (2013). Pengembangan karakter berbasis kearifan lokal hamemayu hayuning bawana (Identifikasi nilai-nilai karakter berbasis budaya). *Jurnal Pendidikan Karakter, 3*(3), 234-246. https://doi.org/10.21831/jpk.v0i3.1249

Wang, C., Shen, J., & Chao, J. (2022). Integrating computational thinking in STEM education: A literature review. *International Journal of Science and Mathematics Education, 20*(8), 1949-1972. https://doi.org/10.1007/s10763-021-10227-5

Yim, I. H. Y., Su, J., & Wegerif, R. (2025). STEAM in practice and research in primary schools: A systematic literature review. *Research in Science & Technological Education, 43*(4), 1065-1089. https://doi.org/10.1080/02635143.2024.2440424

Yuana, R. A., Sajidan, S., & Prasetyo, Z. K. (2025). Strategies for integrating computational thinking and scientific approaches in programming education: A systematic literature review. *Discover Education, 4*, Article 157. https://doi.org/10.1007/s44217-025-00834-7

Yulianti, E., Suwono, H., Rahman, N. F. A., & Phang, F. A. (2024). State-of-the-art of STEAM education in science classrooms: A systematic literature review. *Open Education Studies, 6*(1), 331-353. https://doi.org/10.1515/edu-2024-0032

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