Pertanika J. Soc. Sci. & Hum. 34 (5): xx - xx (2026)

PERTANIKA JOURNALS

SOCIAL SCIENCES & HUMANITIES

Journal homepage: http://www.pertanika.upm.edu.my/

# 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

ARTICLE INFO

*Article history:*
Received: 13 January 2026
Accepted: 25 September 2026
Published: 30 October 2026

DOI: https://doi.org/10.47836/pjssh.34.5.12

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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).

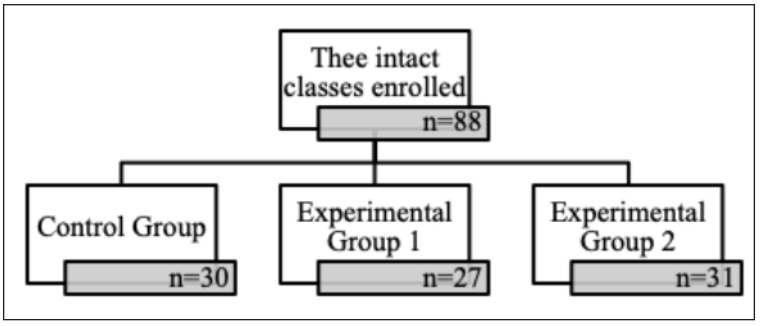


*Figure 1.* Participant flow and allocation across the three instructional conditions

**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?<br>a. The lengthening sound happens if an al-Madd al-Tabe'e letter meets Hamza in one sentence.<br>b. The lengthening sound happens if an al-Madd al-Tabe'e letter meets a letter with Sukoon at the end of a sentence.<br>c. If an al-Madd al-Tabe'e letter meets Hamza in another sentence, the lengthening sound happens.<br>d. The lengthening sound that happens if an al-Madd al-Tabe'e replaces the role of Hamza. | |
| **Feedbacks** | |
| a. | You are incorrect!<br>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.<br>فَكَانَتْ هَبَآءً مُّنۢبَثًّا |
| b. | You are incorrect!<br>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.<br>أُولَٰٓئِكَ الْمُقَرَّبُوْن |
| c. | Correct!<br>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.<br>وَاَصْحٰبُ الْمَشْئَمَةِ ۙ مَآ اَصْحٰبُ الْمَشْئَمَة |
| d. | You are incorrect!<br>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.<br>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.

## ACKNOWLEDGEMENT

We thank the Institute of Research and Community Services (IRCS) of Universitas Negeri Malang for funding this study. We also thank all the participants who followed in Tajweed's class.

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