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Distance Learner's Satisfaction Towards Information Technology Usage

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ABSTRAK

Fokus kajian ialah ke atas kepuasan pelajar terhadap penggunaan teknologi informasi dalam program pendidikan jarak jauh (PJJ). Objektif pertama ialah untuk menentukan tahap kepuasan pelajar terhadap penggunaan Internet dan Laman Web daripada aspek kemudahan, kaedah persembahan, dan perkhidmatan sokongan yang disediakan. Objektif kedua ialah untuk menentukan perbezaan tahap kepuasan pelajar terhadap penggunaan Internet dan Laman Web mengikut aspek latar belakang seperti etnik, gender, jenis organisasi pekerjaan, profesion, pengalaman komputer, dan pencapaian pendidikan. Data diperolehi daripada 81 pelajar PJJ UPM dengan menggunakan soal selidik yang mereka kendalikan sendiri. Keputusan kajian mendapati tahap kepuasan pelajar ke atas penggunaan teknologi informasi secara am adalah sederhana. Tiada terdapat perbezaan tahap kepuasan pelajar dari aspek faktor-faktor yang dikaji. Kajian menghasilkan beberapa cadangan untuk memperbaiki penggunaan teknologi informasi dalam pelaksanaan program PJJ.

ABSTRACT

The study focuses on learner's satisfaction towards Information Technology (IT) usage in Distance Education (DE) programmes. The first objective is to determine the satisfaction level of learners towards Internet and Website usage in terms of facilities, presentation mode and support services provided. Secondly, it determines the difference in learners' satisfaction level towards Internet and Website usage with learner backgrounds in the various aspects of ethnicity, gender, type of organization, type of profession, computer experience and educational achievement. Data were from 81 distance learners of UPM, collected using self-administered questionnaires. Results showed that respondents' satisfaction level on the overall usage of IT in their learning was of moderate satisfaction. There was no difference in learners' satisfaction level of IT usage towards the aspects of facilities, presentation mode and support services provided with learners' background of ethnicity, gender, type of employer, type of profession, computer experience, and educational attainment. The study suggests some recommendations in order to improve the current practice of Distance Education using IT.

INTRODUCTION

The technological advances in the last decade of the twentieth century set the paradigm shift from distribution of information to one of access of information. This shift has many implications in education, one of which is a move in learning from a teacher-centered to a learner-centered environment. It implies a reformation in an important component of educational administration, that is the delivery of knowledge.

Advances in Information Technology (IT) have enabled the delivery of education to be

carried out in a distance mode. The term "Distance Education" (DE) refers, specifically to an instructional delivery that does not constrain the student to be physically present at the same location as the instructor. This means that DE can take place even when a physical distance separates a teacher and student(s). DE could use Keegan's (1988) characteristics consisting of quasi-permanent preparation of teacher and learner, influence of an educational organization, use of technical media, provision of two-way communication and quasi-permanent absence of group learning. Much has been said about the operation and success of DE programmes in Malaysia. One of the factors contributing to the growth of DE in this country is the development of IT tools and facilities. IT in general contributes both to diversification and individualization of education, meaning that the process of teaching and learning becomes diversified while at the same time assists students in getting information according to their learning needs.

This paper reports a study on learners' satisfaction towards information technology (IT) age in a DE programme. Specifically, the first objective is to determine the satisfaction level of learners towards the Internet-based learning in terms of facilities, presentation mode and support services provided by the DE provider. Secondly, it determines the difference in learners' satisfaction level towards Internet-based learning with various learner backgrounds such as type of employer, type of profession, computer experience, educational achievement, ethnicity and gender.

LITERATURE REVIEW

Significance of DE in Malaysia

The demand for having educated and skilled workforce increases rapidly in Malaysia. The country's development in tertiary education during the Seventh Malaysia Plan period (1996-2000) is aimed at increasing the enrolment at the first degree level in the local public institutions of the age-group of 19-24 years from 2.5% in 1995 to 5.6% in 2000 (Government of Malaysia 1996). With the rising cost of face-to-face learning system, knowledge and technology explosion, Malaysia has viewed DE as an alternative mode to the conventional face-to-face learning in providing education and training opportunities (Abdul Rahman 1996).

It has been indicated that one of the goals of DE programme in Malaysia is to meet the target of having at least 30% of the population receiving tertiary education by the year 2020 (Johari Mat 1995). This includes short courses aimed at upgrading the knowledge and skills of the workforce at the managerial and supervisory levels. Historically, DE means correspondence study. However, in Malaysia, Abdul Rahman (1996) interprets DE as having the following objectives: a) To offer members of the society access to education, and acquire knowledge and skills of their choice for life-long learning while the learners are working; b) To offer "second chance" or alternatives to those who wish to pursue higher education for higher qualification; c) To "up-date" educational administrators' knowledge and skills with the latest continuing education facilities; and d) To offer quality education for the less fortunate students especially those in the remote areas.

DE programme has already been in place in Malaysia in the early seventies. Presently, there are five institutions of higher learning running the programmes. There are School of Professional and Continuing Education (SPACE) of Universiti Teknologi Malaysia (UTM), School of Distance Education Programme of Institute Technology MARA (ITM), Centre for Off-Campus Programme of Universiti Kebangsaan Malaysia (UKM), Institute of Distance Education and Learning (IDEAL) of Universiti Putra Malaysia (UPM) and Centre for Distance Education Studies of Universiti Sains Malaysia (USM) (Nur Naha 1998).

Democratization and liberalization of education beyond those of primary and secondary levels can take place with the expansion of DE. DE gives the opportunity for learners to feel free to enrol themselves in their chosen areas that permit flexibility of their hectic working schedules.

Importance of IT in DE programme

According to Litton (1997) DE is a form of life-long learning. Students have the opportunity to attend classes even though they cannot be in the classrooms. Educational resources are offered allowing students to interact with the instructor and other students, creating ubiquitous and equitable learning environment.

IT in general is understood as the use of computers and telecommunication systems for

storing, retrieving and sending information. Armstrong (1993) defines IT as an electronic hardware used to create, communicate, store, modify or display information, and programme software that can control the operations of that hardware. Thus, IT can be used in the process of managing information, management and application development, communication management, operational support, decision support system and office automation in DE programme.

Many universities in the world have used IT for their face-to-face learning and DE. The Open University in the United Kingdom has been using the various tools of IT for almost 20 years (Greenberg 1997). The University of Monash has been using teleteaching linking its students and lecturers across three campuses (Harris 1997). Collaborative engineering allows WWW users to present documents and graphic in an organized manner. This approach of learning engineering through the Internet has enabled learners at distant areas to share and benefit from a certain engineering project design (Ooi 1995).

Sakomoto (1997) believes that IT in DE works as both an equalizer and an amplifier. The former means that the learners get access to vast amount of information using Internet, thus providing equal opportunities. While the latter means that IT increases the amount of information saved and reduces time taken to get the information.

Many factors are found contributing to the effectiveness of DE using IT. Three of the factors are facilities related to IT, the mode of the presentation of learning contents, and the support services received by learners (Wills 1993; Abu Daud *et al.* 1996; Campos *et al.* 1996; Steeples *et al.* 1994). Facilities refer to the environment of learning such as locations of the learning centre, computers and electronic-mail addresses, messages and guidelines in learning throughout the semester about registration and datelines of assignment submissions and examination, handouts and on-line interactive tools. The mode of presentation in learning refers to learning contents layout, illustration such as graphics and pictures, attachment, language used, guided questions, contents sequence and pace, and references. While support services refer to feedback mechanism for learners towards inquiries, alternatives for any computer breakdown, guidance for completing learning exercises and ways of grades to make known to learners.

This brief survey illustrates that DE is becoming more significant with the increase in sophistication in the delivery of learning packages specifically with the use of Internet. While this physical learning environments are important in ensuring success of any DE programme, there is also a necessity to look into learners' satisfaction towards the various facilities, presentation mode and support system of the learning packages.

METHODOLOGY

Research Location and Sample

The research was carried out at the Institute of Distance Education and Learning (IDEAL) of Universiti Putra Malaysia (UPM). IDEAL has just started its DE programme beginning May 1996/97 semester, one of which being the Bachelor of Computer Science. This undergraduate programme has a total 140 students in their first and second year batches. They are spread all over Malaysia, using the Internet to obtain their learning materials and to interact with their lecturers and other students. They are linked to IT tools from their homes, and offices, or they go to learning centres to get access to them. Sampling of respondents was made based on those who attended one of their face-to-face sessions with lecturers at IDEAL in November 1997/98 semester.

This survey looks into the satisfaction level of DE learners on IT usage in their learning. IT usage refers to three components of students' learning environments of IT, namely, "facilities", "presentation mode" and "support services" provided in the DE programme specifically in relation to the use of Internet.

Learners' satisfaction level on IT usage was also examined against learners' backgrounds. They consisted of variables such as type of organization they come from, type of profession, computer experience, educational achievement, computer background, ethnicity and gender.

Data Collection and Analysis

Data were collected using self-administered questionnaires distributed to 81 respondents who attended one of their face-to-face sessions at IDEAL. The questionnaires were collected on the same day in which 74 (87.7%) of them responded.

Questions pertaining to the satisfaction level of learners on IT usage were measured using the Likert scale in the form of "strongly agree (1)", "agree (2)", "undecided (3)" , "disagree (4)" and "strongly disagree (5)" with each item in the questionnaire. The realiability coeffecients for "facilities", "presentation mode", "support services" and the "overall satisfaction" are 0.53, 0.60, 0.61 and 0.85 respectively.

The collected data were analyzed using Statistical Package for Social Science (SPSS) for Windows Release 6.0. Simple statistical tools used were percentages and means to explain respondents' backgrounds and satisfaction towards facilities, presentation modes, support services and overall satisfaction of IT usage. T-test and ANOVA were used to see the difference in satisfaction level according to the different learner backgrounds.

RESULTS

Backgrounds of the Respondents

Data on respondents' backgrounds are shown in Table 1. A larger number of respondents (75.7%) were from the private sector while about a quarter (24.3%) were from the public sector. In terms of type of profession, 14.2% were programmers, 35.3% were in other computer-related jobs and 39.5% were outside the computer line. Twenty-eight percent of the respondents had 1-2 years of computer experience, 25% had more than five years of computer experience and 31% had less than a year of computer experience.

With regard to educational achievements, 59.7% had a Diploma in Computer Science or IT, 19.4% SPM/SPMV or STPM, while 20.9% had other types of qualification such as Degree in Engineering, Degree in Business Studies and Diploma in Engineering. As many as 41.7% of the respondents are currently involved in the basic programming line of work, followed by 27.8% in networking, 19.4% in system development and 11.1% were not at all involved in the computer line. By ethnicity, Malays constituted 47.9% of the respondents, followed by Chinese 26.8%, Indian 18.3% and other races 7.0%. Finally, 62.0% of them were males and 38.0% were females.

TABLE 1
Background of respondents
(n=74)

Background characteristic	Percentage
Type of employer	
Public employer	24.3
Private employer	75.7
Type of profession	
Programmer	14.2
Computer-related job	35.3
Non-computer related	39.5
Computer experience (yrs)	
0	10.0
< 1	21.0
1-2	28.0
3-5	16.0
> 5	25.0
Educational achievement	
Diploma in Computer Science IT	59.7
SPM/SPMV and STPM[a]	19.4
Other qualifications	20.9
Computer Background	
Basic programming	41.7
Networking	27.8
System development	19.4
None	11.1
Ethnicity	
Malay	47.9
Chinese	26.8
Indian	18.3
Others	7.0
Gender	
Male	62.0
Female	38.0

[a] SPM stands for *Sijil Pelajaran Malaysia* or Malaysian Certificate of Education
SPVM stands for *Sijil Pelajaran Vokasional Malaysia* or Malaysian Vocational Certificate of Education.
STPM stands for *Sijil Tinggi Pelajaran Malaysia* or Malaysian Higher School Certificate

Satisfaction on IT Usage

IT usage refers to facilities, presentation mode and support services of learning by means of Internet specifically the WWW and list serve electronic mail. Results and discussion on each component are presented as follows:

a. Facilities

The results of respondents' satisfaction on IT facilities are reported in Table 2. The results show that the mean values of respondents' satisfaction range from 2.3 to 3.4 (1 is the lowest

TABLE 2
Respondents' satisfaction on IT facilities
(n=74)

Facilities	Mean Deviation	Standard
1. The programme provides sufficient Internet and e-mail facilities.	3.39	1.07
2. Information on registration aspects are informed very early in the semester.	3.14	1.11
3. The schedule for the next semester courses are early, accurate and clear.	3.01	1.01
4. The network servers are always giving problems causing late retrieval of materials.	2.34	1.05
5. Messages and news are very seldom shown to students.	2.45	1.01
6. Students are provided with e-mail addresses of other students for communication purposes.	3.01	1.20
7. The centre provides adequate computer facilities when faced with problems.	2.88	1.12
8. There is no problem in getting assistance from the centre (when problem occurs)	2.67	1.10

and 5 is the highest mean values). Specifically, the respondents agree that the programme provides sufficient Internet facilities (3.39), information on registration aspects are made known early in the semester (3.14). The lowest mean value pertaining to satisfaction on facilities is that the network servers are always giving problems to the learners (2.34), messages and news are frequently shown to them (2.45) and there are problems in getting assistance from the centre when difficulties crop up (2.67).

b. Presentation Mode

Data on respondents' satisfaction on presentation mode are reported in Table 3. The mean values fall within the range of 2.89 to 3.61. The highest mean value was for the statement on content layout that there is a clear introduction to each lesson learned (3.61). Other statements followed that the text title is clearly distinguished from the text (3.57), objectives and outcome are clear and relevant (3.54), the fonts in the modules could be clearly read (3.38), the language used in the programme is simple and appropriate for their reading ability (3.39), sufficient questions are given in each lesson (3.47), the contents of lessons are sequenced in clear and logical manner (3.25).

c. Support Services

Table 4 shows respondents' satisfaction towards IT support services in their learning. The results are as follows: Comp-Science assists them in getting the materials they need (3.38), learners get assistance from their lecturers when questions are put up (3.01), sufficient information is provided to those who missed tutorial sessions (2.73), adequate guidance relating to exercises and grading are given (2.74), and there is a delay in replying to inquiries and questions made by learners (2.60).

Overall Satisfaction of IT Usage

Table 5 portrays respondents' overall satisfaction of IT usage. The statements that have the mean values exceeding 3.5 (high satisfaction) are as follows: the programme has benefited the learners in their programme, the learners believe that the programme will determine their future, and the use of internet has enhanced their learning process.

The overall satisfaction revealed that learners had moderate satisfaction towards the whole programme. This is indicated by the overall mean value of 3.105 and only four of the fifteen statements exceed the mean value of 3.5 and above.

TABLE 3
Respondents' satisfaction on presentation mode
(n=71)

Presentation Mode	Mean	Standard Deviation
1. Content Layout		
a. Fonts are clearly read	3.38	1.03
b. Titles of texts are clearly distinguished from the rest of the texts	3.57	0.84
c. The layout of modules has poor headings, spacing and colouring	2.91	1.01
d. The objectives or outcomes of the learning are clear and relevant	3.54	3.66
e. There is clear introduction to each lesson learnt	3.61	3.44
2. The lessons are provided with sufficient illustrations such as graphics, samples, pictures to help students understand the subject matter better	2.92	0.10
3. There are attachments provided in each of the lessons learned for additional materials	2.89	0.94
4. The language used is simple and appropriate for reading level of students	3.39	0.92
5. Questions are provided for practice in each of the lessons learned	3.47	0.95
6. Each of the lessons does not provide references for reading purposes	3.03	1.01
7. The contents of the lessons are sequenced in a clear and logical manner	3.25	0.89
8. The lessons provide an appropriate pace for students to learn since contents are divided into units that they can learn in a single setting	3.26	0.97

TABLE 4
Respondents' satisfaction on IT support services
(n=72)

Support Services	Mean	Standard Deviation
1. Students are able to get assistance from lecturers when there are questions asked	3.01	1.11
2. Comp-science assists us in getting the information that we need	3.83	0.98
3. When learners miss tutorial session, sufficient information is provided in the system for them to retrieve those tutorial sessions	2.73	1.14
4. There is a delay of replying to inquiries and questions made by learners	2.60	0.95
5. When a breakdown occurs, learners are provided with prompt delivery of study materials	2.63	0.99
6. There is adequate guidance to learners in terms of completion of exercises and grading	2.74	1.02

TABLE 5
Respondents' satisfaction of overall satisfaction of IT usage

	Overall Satisfaction	Mean	Standard Deviation
1.	I enjoy this programme	3.49	3.64
2.	I will recommend this web base classes to my friends	3.12	1.23
3.	The learning materials were easily understood	2.95	0.98
4.	The use of Internet enhance the teaching learning process	3.54	1.03
5.	I would like to take other courses using the Internet which is similar to this	3.27	1.14
6.	I would have learned more in a traditional class	2.20	0.94
7.	The programme which mainly used IT could be improved	1.80	0.78
8.	benefit from this programme	3.92	4.82
9.	I am very comfortable using the Internet to get my learning materials	3.38	1.00
10.	I don't face any major problem in pursuing the programme	2.81	1.08
11.	I can easily seek for help when I am confronted with a problem	2.74	1.02
12.	The system is well integrated into both hardware and software	3.20	0.90
13.	I will accept any kind of assignments given when joining the programme	3.51	0.81
14.	I believe this progamme will determine my future	3.68	0.87
15.	I have very little confidence in finishing the programme	2.97	1.27

TABLE 6
T-test results of respondents' backgrounds (Type of employer and gender) towards overall satisfaction of IT usage

Students Background	No. of Cases	Mean	t-value	Df	p
1. Type of Employer					
Public	17	47.82	0.060	68	0.808
Private	53	50.77			
2. Gender					
Male	45	50.04	5.936	70	0.170
Female	27	50.03			

Significant at 0.05 level

The results of t-test on type of employer show that there is no significant difference in means of satisfaction towards IT usage between respondents from the private and public sectors, and between male and female. Similarly the results of ANOVA which reveal that there is no difference in means of satisfaction towards IT usage among respondents having different types of profession such as programmer, computer-related and non-computer related personnel; varying in years of computer experience; having different computer backgrounds such as basic programming, networking, system development and without; possessing different educational attainment whether with computer qualifications or without; and ethnicity of Malay, Chinese, Indian and others (Tables 6 and 7).

TABLE 7
Summary of ANOVA results of respondents' background towards overall satisfaction of IT usage

Students Background	F-Ratio	p
1. Type of profession	1.0600	0.370
2. Years of computer experience	0.5440	0.704
3. Background in computer	0.6300	0.590
4. Ethnicity	0.6134	0.610

Significant at 0.05 level

TABLE 8
Suggestion on improvement of IT usage (n=23)

Suggestion	Number	Percentage
1. More coordination, commitment and interaction	9	39.1
2. Better presentation	4	17.4
3. Backup servers and sites for down loading	4	17.4
4. More accurate scheduling	2	8.7
5. More variation in IT utilization	2	8.7
6. Others	2	8.7
Total	23	100.0

Table 8 indicates students' suggestions on improvements of IT usage in their programme. The suggestions are: to have more coordination, commitment and interaction among learners, tutors and administrators (39.1%), to have back up servers and sites for downloading materials (17.4%), to have better presentations of learning materials (17.4%), to have more accurate scheduling (8.7%), to have more diversified IT utilization (8.7%) such as face-to-face tutoring sessions, and personal on-line assistance.

CONCLUSION AND DISCUSSION

On the background of the respondents the study concludes that most of the students enrolled in the DE programme of Bachelor in Computer Science were Malay men, working with private employers, with a tendency of those having basic educational background in Computer Science or IT, and with some working experience in computer-related environments such as basic programming, networking, and system development. This profile of learners implies that there are opportunities for those working in computer-related environments to upgrade their education by pursuing in a DE programme. It also suggests that DE is an alternative mode of pursuing tertiary education for those who are working or those who choose not to give up their jobs.

The study also concludes that the overall satisfaction of learners on the use of IT specifically the Internet-based learning environment is moderate. This result could be possibly explained in several ways. First, the DE programme specifically the Bachelor in Computer Science was still at its infancy stage. With less than two-year experience, it is probably believed that the IT tools used in the programme have not reached a superb intensity of use, and monitoring compared to other established institutions which have run the DE programmes for more than two decades such as The Open University in the United Kingdom and Monash University in Australia (Greenberg 1997; Harris 1997). Second, the respondents had undergone the programme for only one or two semesters. The moderate level of satisfaction was felt since they had not yet completed the full programme as to make them able to gauge the true satisfaction of learning using the Internet learning packages. Nevertheless, the research is

not considered premature as far as the experience of IDEAL in running the programme because of the fact that evaluation on the effectiveness of any educational programme should be conducted continuously whether at its formative or the expansion stage.

The study further concludes specific satisfaction of learners towards facilities, presentation mode and support services related to Internet usage in their learning. The moderate level of satisfaction towards facilities shows that learners felt certain aspects concerning facilities in Internet usage should be looked into and improved such as assistance for on-line tools to furnish their learning, the need for back-up network servers in case of breakdowns, and sites for downloading learning materials.

The satisfaction of learners towards presentation mode was generally higher than that of facilities. Learners however felt that there is a need to increase illustrations such as graphics, samples and pictures. The findings also indicated that learners favoured the programme to have more learning attachments as this will help them in searching additional reading materials.

Concerning support services, learners indicated that they need better back-up information delivery for missed tutorial sessions, and faster reactions from lecturers and administrators towards their queries.

The study finally concludes that there is no significant difference in the means of satisfaction towards Internet usage of the DE programme according to the various categories of learner backgrounds such as types of employer, type of jobs, computer experience, educational attainment, ethnicity and gender.

RECOMMENDATIONS

Knowing the satisfaction of DE learners on the use of their learning delivery packages via IT is regarded as a component of evaluation of the educational programme. Based on the results of this study it is recommended that any DE provider should continuously conduct evaluative studies on the various aspects of the DE programme development involving learners, lecturers, and administrators (Worthen and Sanders 1987). Periodic monitoring of DE learners is felt more necessary compared to the conventional in-campus students because the former involves students of diverse backgrounds in terms of distance and location, and learning schedules as they are mostly learning while working. Evaluation of DE programme is also significant towards materialising the genuine goals of increasing the opportunity of the population to achieve tertiary education.

Some recommendations for future research are put forth as follows: First, similar research is suggested to be conducted on other groups of learners using IT tools in other institutions. Second, further research should be carried out on those who will be graduating from the current programme. This may increase the applicability of the research focus in relation to satisfaction of Internet usage in the DE programme as they have undergone the complete cycle of the programme. Finally, as an alternative to this research approach, the use of qualitative technique is suggested to see the satisfaction level of learning using Internet from different perspective such as experience over a certain time duration, and the link between certain events in their work with learning performance.

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