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Using Web-based Resources in Learning: Factors That Affect Degree Students' Readiness

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ABSTRACT

The widespread acceptance of Web Technology in our tertiary institutions has brought about changes in the style, quantity and variety of resources that are made available to students. Fundamentally new learning environment is provided for students. On the other hand, there is still question about student readiness in using the abundant resources made available to them on the Web. This study examines students' readiness in using web-based resources. Variables that were looked into are demographic background, level of technology usage, level of computer resources usage and their perspective on technology. 294 questionnaires were distributed randomly to degree engineering students (electrical, mechanical and civil). Based on students' ability on using web-based resources, result obtained from quantitative data showed there was a significant difference between student from different semesters ($F = 4.032$, $p = 0.000$) and their accommodation ($t = 7.255$ and $p = 0.007$). Results of the Pearson correlation analysis revealed that there was a fair degree of relationship between students' ability and students' attitude on web-based resources ($r = 0.310$, $p = 0.000$)

Keywords: Web-based resources, technology, readiness

Introduction

It is widely known how computer usage is important in our life nowadays. Workers are expected to be computer literate and to be able to perform their tasks efficiently and effectively. Teachers and students are encouraged to integrate technology in their teaching and learning. A number of research done have proven that technology can help to enhance and improve on the learning process. Hence, information technology companies try to come out with new hardware and software that promise better service and usage to the users. Parallel with the increasing usage of information technologies in our life, graduates are expected to be knowledgeable and competent in computer usage.

Knowing the existing scenario, academicians try to play a role in providing the type of graduates needed. With web-based learning, students are expected to develop the skills in information retrieval and communication, become independent individuals, and competent computer users. These are the results expected from the students, but what about the expectation of the students when they are introduced to this learning environment? Is there any effort done to determine students' level of readiness in using the information technologies? Do the students know how to access and use web-based resources effectively and efficiently?

In order to ensure students' readiness in using web-based resources, it is important to know their demographic background, level of technology usage, level of computer resources usage and their perspective on technology.

Literature Review

Pitrik and Holzinger (2002) and Alias and Hussin (2002) reported that quality learning could be achieved with the support of technology. Internet can be used to expose students to exploratory learning and assist students to gain on-line access to various applications, exercise language activities and increase the communication among students.

Much research has been done on determining the effectiveness of learning Statistics by using technology. Suanpang, et al. (2004) did a comparison study to determine the effectiveness of a new online course in the subject of "Business Statistics" between two groups of students, one studying using a traditional lecture-based approach, and the other studying using e-learning. While Su, et al. (2002) developed a statistical e-learning system to be used as an aid in classroom teaching. Interactive environment designed in the system was aimed to help self-regulated students learn flexibly and also to encourage cooperation and communication between students.

A study done by Arif (2003) and Sheard et al. (2000) concluded that in general ,students favored traditional delivery methods compared to web-based

delivery method. The students rated significantly more highly lecture notes, assessable exercises, assignments, reading materials, and reading lists, in paper format rather than on the Web. Students also perceived immediate feedback and support from academic staff as an important element in their learning process. Zariski and Styles (2000) reported that all students interviewed in their study preferred to study on campus rather than online, mainly because there was a lack of communication between the academic staff and other students.

Sheard et al. (2000) and Song et al. (2004) stated that experience with the technology influenced the participants' perspectives of how useful the technologies were for Web-based resources and online learning. This view was shared by Ibrahim et al. (2001) when they highlighted the importance of mental readiness, right attitude and appropriate training on computing knowledge and skills be given to students before implementing the integration of technology in any educational systems.

Motivation and interest influence the way information is used and critically evaluated. Hence, design of the course, comfort with online technologies, motivation of the learner and time management of the learner play an important role in creating successful on-line learning environments (Song et al., 2004; Santhanam and Leach, 2000). All the elements mentioned were in line with recommendation given by Zariski and Styles (2000). In order to enhance students' learning in online environment, they recommended deficiencies in online environment to be addressed, acknowledge the affective dimension, streamline online structure, encourage student reflection, provide initial an ongoing support, and lastly mix modes should be applied.

Becker and Maunsaiyat (2002) and Njagi et al. (2003) found that gender and exposure to technology did give significant effect on students' attitudes towards technology. The statement was similar to Ibrahim et al. (2001) when they indicated male respondents had significantly more positive attitude than female and those with computers had significantly more positive attitudes compared to those without computers. In addition, Ibrahim et al. (2001) stated that in an online learning environment, students were found to be only moderately ready and age had a strong significant relationship with level of readiness. While in his literature review, Arbaugh (2000) noted that in recent studies women attitudes towards computing and technology are changing based on age, experience and ownership. Hence, these provide initial evidence that men and women may be equal terms in internet-based courses.

Studies done by Moan and Dereshiwsky (2002) suggested the value and importance of time management skills for students who are interested in learning via the Internet. The suggestion was supported by investigations done by Santhanam and Leach (2000). They reported, time spent on using computers as one of the main predictors of student ability to use computers.

Students' predominant learning styles cannot be used as a predictor to determine students' engagement in Web coursework (Moan and Dereshiwsky,

2002). On the other hand, according to Ibrahim et al. (2001) successful online learning depends on the presence of self-directed learning because it is the function of the individual learner. As a self-directed learner, students should be able to explore more information and construct more knowledge on their own. Unfortunately, students involved in their research were reluctant to take control of their own learning. Hence, it is important for the instructors to have adequate information on the students to ensure it can be incorporated into the learning activities.

Technical problems such as computers "hanging up", the slow speed of the Internet connection and lack of community are parts of the components that create barriers in on-line learning environment; therefore, Ibrahim et al. (2001) and Nyagi et al. (2003) recommended adequate training should be given to students before they enrolled in any online courses to ensure students' readiness. Access problems due to insufficient numbers of computers on campus and lack of basic computer skills are also a hindrance to students' readiness on using Web-based resources. Zariski and Styles (2000) in their qualitative study, identified strategies for coping with the technical demands in online learning tended to dominate student approaches to learning and it seemed to preoccupy students and detract them from the content. Students involved in the study, wished for more tutorials on the technical aspects of online learning be given to them at different stages.

Objective of the Study

The main aim of this study is to report on degree students' readiness in using technology and indirectly to conclude on students' readiness in using web-based resources. The specific objectives are:

1. To determine the level of degree students' readiness in using web-based resources.
2. To identify degree students' profile that will affect their readiness in using web-based resources

Methodology

294 questionnaires were distributed randomly to degree students taking courses offered by the Faculty of Engineering (Civil, Electrical, and Mechanical). The raw data were examined using the SPSS ver 13.0 software to identify any association between the variables and students' ability in using technology.

Questionnaires distributed to respondents as a medium to obtain the information were prepared in English. 294 sets of questionnaire were distributed

during this study. The questionnaires were being structured to get standardized, close-ended questions. The questionnaire was designed with a total of 19 questions, consisting four sections.

Section One was about the profile of the respondents. There were 10 questions to be answered in this section. The purpose of this section was to identify the students' program, semester, gender, course and their residential status. It was also meant to gather information on students' family backgrounds. Items looked for are total family income, family highest qualification, guardians' occupation and also students' financial sources.

Section two was about the use of technology which comprised items in questions 11 to 15. This section focuses on students' level of technology usage. Five-point Likert-scale items are used to measure the level of students' current ability in using computer resources and to determine the importance of internet usage. Respondents have to response to each item using scale 1 (Never Tried) to 5 (Expert) to measure their current abilities while scale 1 (Not important) to 5 (Don't Know) were used to determined the importance of internet usage.

Section Three was about the usage of computer resources. These questions included 19 items using scale 1 (Never) to scale 6 (Every Day) to measure the time spend on computer resources. Students' perspectives and exposures to educational technology were measured in Section Four. Respondents have to answer each items based on the Likert scale given. They were given choices such as scales 1 (Strongly Disagree) to 5 (Strongly Agree), scales 1 (Never or Almost Never) to 5 (Always or Almost Always).

Results and Discussions

Data Analysis

To determine the level of degree students' readiness in using web-based resources, they were asked to rate their current expertise as a computer user. As illustrated in Table 1, more than half (68%) of the degree students rated themselves as novice, this was the highest proportion compared to 16.7% of the respondents who rated themselves intermediate, whilst 9.5% of the respondents' don't use the computer.

Degree students' current expertise was analyzed based on their semester, gender, course and type of residential. The results indicated that majority of degree students in semester 1 to semester 8 are novice in using the computer. The analysis also indicated that degree students in Semester 3 (42.2%) are the most who claimed to be novice in using the computer. Meanwhile, it also shows that 58.4% of the degree students who claimed to be novices are female students compared with male students, which computed 61.5%.

However, there are 76.5% of the male students who considered themselves as an advanced computer user. According to result obtained, degree students who are novice in using computer come from Civil Engineering students (33.3%) and Electrical Engineering students (19.0%). There are 3.7% (calculated within expertise) of the Electrical engineering students who admitted to be a non-computer user. Result also shows that 46.3% of the degree students who considered themselves to be a beginner in using the computer compared are non-residents students.

Table 1: The Expertise of Degree Students

		Expertise			Total
	Don't use	Novice	Intermediate	Advanced	
N	28	200	49	17	294
Percent	9.5%	68%	16.7%	5.8%	100.0%

Based on their current ability in using the computer, students were asked to evaluate their knowledge and skills on specific computer tasks. Majority of the degree students considered their current computer ability as intermediate and advanced which calculated more than 60%. However, more than half of them (53.3%) stated that they never tried to create a website on their own. According to the data gathered, degree students believed that they are good in evaluating information from the Internet and other sources critically (41.2%) and using a computer to find scholarly information and resources (40.9%)

In order to determine the level of students' personal experiences with educational technology, the degree students were asked to indicate how often each of the given statements were true to them. They were given 12 items in this section and they were supposed to rank their views regarding educational technologies. Table 2 shows students' responses, which were divided into two categories; 'sometimes', and 'usually, always and almost always'. Based on the table, more than 40% of the degree students rated 'sometimes' for five items listed with the highest is 'I receive adequate instruction from my instructors in using technologies' (51.4%).

On the other hand, more than 50% of the degree students responded 'usually, always or almost always' for four items listed in the questionnaires. About 60% of the students stated most of the time they are comfortable learning to use new technologies needed.

Table 3 shows the responses provided by the degree students' when asked about communication tools and presentation software that they would like their lecturer to use in their courses. All the listed items received about 40% responses. Online group chat was the most favorite answer among degree students, which was the choice of 43.9% degree students.

Table 2: Degree Students' Exposure to Technology

	%
I can easily find and use online library resources	39.3
My instructors' use of educational technologies improves my learning	44.0
My instructors are proficient in using the educational technologies for	44.4
My instructors are proficient in the educational technologies I need	44.7
I am proficient in using the educational technologies needed	45.9
I receive adequate instruction from other sources in using technologies	46.7
I receive adequate instruction from my instructors in using technologies	51.4
Educational technologies are used consistently throughout the University	47.4
My courses prepare me to use technology in my career field.	52.9
I can easily get access to a computer when I need it	56.0
My use of educational technologies improves my learning	56.1
I am comfortable learning to use new technologies needed	59.5

Table 3: Educational Technologies Preferred by Degree Students

	N	Percent
Email list of students	99	37.2
Online discussion boards	125	40.8
Online group chats (chat rooms)	137	43.9
Instant messaging	140	39
Video conferencing	123	42.6
PRESENTATION		
Audio/video clips, animation or slides	60	37
Power Point presentations	76	37.1
Streaming videos	136	42.6
Computer simulations	110	37.4

ANOVA test was used to explore the differences in the mean values of a dependent variable for several categories of a single independent variable (e.g. students' demographics). Independent variables that were analyzed were gender, semester, courses, accommodation, income, family qualification and occupation, and financial resources.

While the dependent variables were students' computer ability, perspective, exposure to technology and time spend in using computer and educational technologies.

Table 4: Analysis of Variance (ANOVA) between Students' Computer Ability and Different Semesters

Ability	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1737.673	7	248.239	4.032	.000
Within Groups	17609.160	286	61.570		
Total	19346.833	293			

The results of ANOVA test and independent samples t-test (Table 4 and 5) indicated that there was a significant difference in students' computer ability among students from different semesters (F = 4.032 was significant at 0.000) and their accommodation (t = 7.255 and p = 0.007).

Table 5: t-test – Accommodation and Students' Computer Ability

	Lodge	N	Mean	Std. Deviation	Std. Error Mean
Ability	Hostel	96	24.5625	6.70399	.68422
	Others	198	27.1566	8.62123	.61268

Through one-way analysis of variance (ANOVA), it was also observed that students from different semesters gave the indication that there was a significant difference in their attitude, exposure to technology, perspective and time spend in using computer resources. The analysis was significant at F = 2.214 with p = 0.033, F = 3.507 with p = 0.001, F = 2.900 with p = 0.006 and F = 6.525 with p = 0.000, respectively.

Table 6: Correlation between Degree Students' Expertise and Their Computer Ability

		Expertise	Ability
Expertise	Pearson Correlation	1	.351(**)
	Sig. (2-tailed)		.000
	N	294	294

** Correlation is significant at the 0.01 level (2-tailed).

To study on degree students' relationship between their expertise and their profiles, the Pearson correlation analysis was used. The data obtained indicated that none of the students' profile correlation was significant that related to their expertise where p – value > 0.05. On the other hand, Table 6

showed that the scores correlate positively between students' expertise and students' ability on using web-based resources where r = 0.351, p = 0.000.

The relationship between expertise and time spend in using of web-based resource and the relationship between expertise and students' perspective were fairly weak where r < 0.25 respectively but significant at p < 0.05. There was no correlation between students' expertise and their opinion on the amount of knowledge they have on using web–based resources. Table 7 displayed the result obtained by applying Pearson's Correlations between variables. In this study, the correlation coefficient between computer ability and other variables were weak or fairly good since r² was between 0.216 and 0.572.

Table 7 : Pearson's Correlations between Variables

	Expertise	Computer Ability	Attitude	Exposure to Technology	Perspective	Time spend
Expertise	1					
Computer Ability	.351(**)	1				
Attitude	-.030	.310(**)	1			
Exposure to technology	.123(**)	.470(**)	.330(**)	1		
Perspective	-.079	.216(**)	.237(**)	.411(**)	1	
Time spend	.171(**)	.572(**)	.400(**)	.461(**)	.216(**)	1

** Correlation is significant at the 0.01 level (2-tailed).

Regression analysis is a powerful and flexible procedure for analyzing associative relationships between a metric dependent variable for one or more independent variables. In this study, regression analysis was also used to analyze the relationship between dependents and independent variables of degree students. R² is the sample coefficient of determination which measures the percentage of the total sum of squared deviations of the dependent variable around its mean that is accounted for by the independent variable. The coefficient r square varies between 0 and 1.

Table 8: Regression Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.670(a)	.449	.439	6.08525

a Predictors: (Constant), exposure, Expertise, attitude, perspective, time

Linear regression analysis was done by taking degree students computer ability as its dependent variable and other variables as independent variables. Table 8 showed that changes in the independent variables explained about 45% of the variation of the dependent variable around its means.

Discussion

The result of this study indicated that in general degree students are still not comfortable with their current expertise in using computer in their studies. If we assume that the degree students rating of expertise in using computer is a reflection of their true ability, then female students taking electrical and civil engineering courses who were in semester 3 and didn't get hostel facilities are most in need of assistance for building confidence and enhancing ability to use computers.

Even though the degree students from the engineering faculty claimed not to be advanced computer users, they suggested that they are capable in using computer for findings and evaluating information from the internet and other sources critically.

Students' attitude towards technology does give a significant effect on students' readiness in using web-based resources in their learning (Ibrahim et al., 2001). This study reveals that the degree students do have a positive attitude towards technology but they should be provided with appropriate training on computing knowledge and skills.

This study also reveals that students' expertise in using computer does not depend on their background or profiles. However, the result obtained did agree with the study done by Njagi et al. (2003) where he found out gender and exposure to technology did give significant effects on students' attitudes towards technology.

Santhanam and Leach (2000) reported that time spend on using computers as one of the main predictors of student ability to use computers. Pearson analysis done in this study also indicated similar result. Students can improve on their computer ability and application to technology if they are given enough time to explore, provided with proper guidance and also easy access to the required facilities.

Conclusions

This paper has presented that in general degree students considered themselves to be novice in terms of their technology expertise and also discussed on the factors that affect students' readiness in using web-based resources. From the results, it can be concluded that students' profile does not influence students' readiness in using web-based resources aside from their computer ability, time

spend and their exposure to technology. Therefore, instructors can incorporate Internet into learning activities without worrying about their students' profile since it was not a factor that affects their readiness.

For further research, psychological factors in information seeking behavior should be considered as one of the determining factor since Heinstrom (2003) listed cognitive processes, motivation and interest, and cognitive styles to be aspects that influence information behavior. In order to be able to refer to web-based resources effectively and efficiently, students should have the right attitudes toward information seeking behavior.

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