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Evaluation on Acceptance and Usability of Simulation ASE-Learning Tool

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Abstract: ***This study evaluates the acceptance and usability of Logicly simulation software as an e-learning tool. The study further investigated the relationship between satisfaction and their level of performance in the subject. Participants of the study are BSCS students of Surigao del Sur State University-Tagbina Campus who are enrolled in Digital and Logic Circuits during the first semester of academic year 2016-2017. These students used the simulation software. Data were obtained through a survey questionnaire. Mean of the responses was computed to determine the ease of use, ease of learning, satisfaction, and perceived usefulness levels in using the Logicly Simulation software. T-Test was used to determine the variance in gender of using Logicly simulation software usage where level of significance is set at 0.05. To determine the index of correlation between the relationship of satisfaction in using the simulation software and the performance of students in the subject, Pearson Product Moment Correlation(r) was used. Results of the study revealed that students find the simulation software useful and they are satisfied in using it. Conversely, they find it not easy to use and learn. In addition, there was a significant difference in gender in software usage where males tend to use the software than females. It was found that there is a positive relationship between satisfaction of students in using the simulation software and their performance in the subject.***

Keywords: acceptability, usability, satisfaction

1. Introduction

Simulation software is not new, but what is new is the application of simulation technology to the area of e-learning: this is at the core of the next generation educational software to support learning. Costabile et.al, (2005) states that the software should take into account the way students learn and also provide good usability so that student's interactions with the software are as natural and intuitive as possible. In this sense there should be a synergy between the learning process and a student's interaction with the software. Usability features should not only allow people to efficiently manipulate the interactive software, but should also be appropriate for the intended learning task. When this synergy occurs, the use of the software can be thought of as "integrated" and a seamless link develops between the use of the software and the learning process. On the other hand, User acceptance is defined as the demonstrable willingness within a user group to employ information technology for the tasks it is designed to support. Thus, the concept is not being applied to situations in which users claim they will employ it without providing evidence of use, or to the use of a technology for purposes unintended by the designers or procurers (Dillon, 1996). This study claims that a) perceived ease of and usefulness affects students attitudes towards the simulation software b) gender predicts usage of simulation software c) there is a positive relationship between students satisfaction and their level of performance in the subject in using the software.

Technology Acceptance Model (TAM) is considered an influential extension of theory of reasoned action (TRA), according to Ajzen and Fishbein (1980). Davis (1989) and Davis, Bagozzi, and Warshaw (1989) proposed TAM to explain why a user accepts or rejects information technology by adapting TRA. It is specifically tailored for modeling users' acceptance of information systems or technologies. According to Davis (1989), there is a relationship between users' beliefs about a technology's usefulness and the attitude and the intention to use the technology. However, perceived usefulness exhibits stronger and more consistent relationship with usage than did other variables reported in the literature. In addition, an individual may adopt a technology if he or she perceives it as convenient, useful and socially desirable even though they do not enjoy using the technology (Saga & Zmud, 1994).

Much has been done in the past studies related to acceptance and use of e-learning. However, factors affecting the acceptance of simulation software as an e-learning tool used in higher education have not been explored well.

This study is significant for it helps to predict students' response towards using the simulation software. Hence, the result of the study can provide recommendations to the instructors handling the subject to provide supplemental activities to enhance their learning strategies to support better learning process of the students.

2. Conceptual Framework

This study is anchored on one of the most influential models widely used in the studies of the determinant of IS/IT acceptance which is the Technology Acceptance model (Davis 1989).

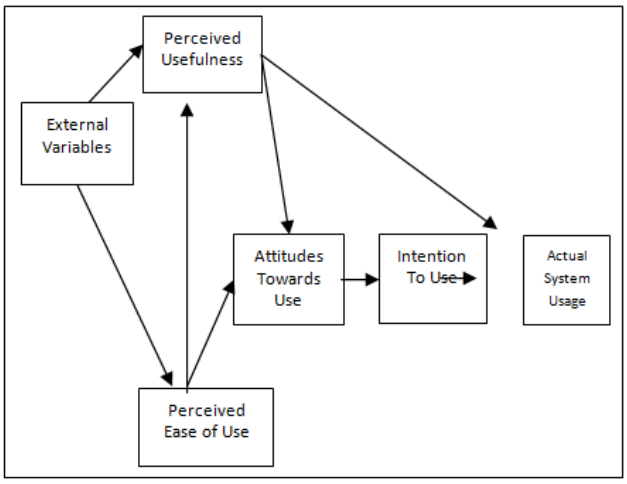

Figure 1: Davis' Technology Acceptance Model

The **technology acceptance model** (**TAM**) is an information systems theory that models how users come to accept and use a technology. The model suggests that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it. The goal of TAM is to predict information system acceptance and diagnose design problems before users have experience with a system. TAM theorizes that an individual's behavioral intention to adopt a system is determined by two beliefs, perceived usefulness and perceived ease of use. Perceived usefulness (U) is defined as "the degree to which an individual believes that using a particular system would enhance his or her productivity" while perceived ease of use (EOU) is defined as " the degree an individual believes that using a particular system would be free of effort" (Davis, 1989). According to TAM, U and EOU have a significant impact on a user's attitude toward using the system (A), defined as feelings of favorableness or favorableness toward the system. Thus, attitude is a general construct not tied to any specific beliefs about the technology. Behavioral intentions to use the system (BI) are modeled as a function of A and U. BI then determines actual use. Research has consistently shown that BI is the strongest predictor of actual use (Davis et. al., 1989).

3. Methodology

This study is quantitative. The population in the study are 30 randomly chosen second year students of Bachelor of Science in Computer Science of SDSSU-Tagbina Campus. These students are enrolled in Digital Logic Circuits during the first semester and use Logicly Simulation software as eLearning tool. To know the students ease of use, ease of learning, satisfaction, and perceived usefulness levels in using the Logicly Simulation software, a survey was conducted using the adapted USE questionnaire developed by Lund (2001). It was conducted at the end of the semester. Students are provided with USE survey questionnaire where they are asked to respond to all the items using the Likert scale with one of the responses that range from Strongly Agree (1) to Strongly Disagree (7). After the survey was conducted, students' responses are tallied and analyzed using Minitab statistical package.

3.1 Research Design

To know the students ease of use, ease of learning, satisfaction, and perceived usefulness levels in using the Logicly Simulation software, a survey was conducted using the adapted USE questionnaire developed by Lund (2001). It was conducted at the end of the semester. Students are provided with USE survey questionnaire where they are asked to respond to all the items using the Likert scale with one of the responses that range from Strongly Agree (1) to Strongly Disagree (7).

3.2 Study Participants

The population in the study are 30 randomly chosen second year students of Bachelor of Science in Computer Science of SDSSU-Tagbina Campus. These students are enrolled in Digital Logic Circuits during the first semester and use Logicly Simulation software as eLearning tool.

3.3 Instrumentation

The researcher utilizes the adapted USE questionnaire developed by Lund (2001). It was conducted at the end of the semester. Students are provided with USE survey questionnaire where they are asked to respond to all the items using the Likert scale with one of the responses that range from Strongly Agree (1) to Strongly Disagree (7).

3.4 Data Gathering Procedures

The data for this study are collected through a survey using an adapted USE questionnaire developed by Lund (2001). Prior to the conduct of the test, each student is given a consent letter. Each student affixed their signature and the signature of their parent/guardian if they are willing to be part of the study. They are not, however, obliged to join the study.

3.5 Data Analysis

Analysis of data begun after the survey was conducted. In order to determine the ease of use, ease of learning, satisfaction, and perceived usefulness levels in using the Logicly Simulation software, mean of their responses will be computed. T-test will be used to determine the variance in gender of using Logicly simulation software usage where level of significance is set at 0.05. The Pearson Product Moment Correlation(r) was used to determine the index of correlation between the relationship of satisfaction in using the simulation software and the performance of students in the subject.

4. Results

Table 1 below shows the descriptive interpretation on the average of the students' responses from Strongly Agree (1) to Strongly Disagree (7). On the other hand, data in Table 2 shows the results of the survey on Ease of Use, Usefulness, Ease of Learning and Satisfaction survey result. Tabular values reveal that BSCS students slightly agree on the ease of use and ease of learning the Logicly

simulation software. However, they are satisfied in using and find it useful.

Table 1: Descriptive interpretation on the average of the students' responses

Scale	Description
1	Strongly Agree
2	Moderately Agree
3	Slightly Agree
4	Agree
5	Slightly Disagree
6	Moderately Disagree
7	Strongly Disagree

Table 2: Ease of Use, Usefulness, Ease of Learning and Satisfaction survey result

Factors	Mean of Responses	Descriptive Interpretation
Ease of Use	3.4	Slightly Agree
Usefulness	4.4	Agree
Ease of Learning	3.7	Agree
Satisfaction	4.1	Slightly Agree

Table 3: Analysis of variance in gender of using Logicly simulation software usage

Gender	Mean	P-value	F-value
Male	3.93	0.786	0.43
Female	5.27		

Results in Table 3 reveal that there is a significant difference between male and female students' usage of the software. The mean value shows that male tend to use the software compared to females.

Table 4: Correlation of Students' satisfaction in using Logicly simulation software and their performance in the subject

Pearson correlation of Satisfaction and Performance of students	0.045
P-Value	0

Data in Table 4 shows that the hypothesis is accepted at .01 level of significance. This means that there is a positive relationship between satisfaction of students in using the simulation software and their performance in the subject is significant which implies satisfaction in using the simulation software determine the performance of students in the subject.

5. Discussion

Generally, the results showed that students find the Logicly simulation software useful and they are satisfied in using it. However, they find the software not easy to use and learn. Gender difference was found significant where male students are significantly better than females in computer skills. This result could be attributed to the technical skills difference between male and female students which conform to the study of Tengku (2005). Results also revealed that there is a positive relationship between satisfactions of students in using the simulation software. On the other hand, satisfaction of students in using the software predicts students' performance in the subject. However, the results of the study were limited since the population sample is small.

6. Conclusion and Recommendations

The study has some limitations. Using random sampling approach, data were collected from SDSSU-Tagbina Campus only; therefore results of the study may be restricted to the particular settings. Replication of this study in other campuses of SDSSU would help understand the implications of this study.

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