ICEEPSY 2014

Evaluation of Satisfaction Using Online Learning with Interactivity

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Abstract

Online learning provides a potential for new research environmental to make it easier to enter into contracts with other students during the review process is done. The main purpose of this study was to ascertain the influence of student satisfaction in online learning. A total of 113 students of masters coursework in Information Communication And Technology (ICT) and Information Technology (IT) course have been made respondents in the study and data were collected through online questionnaires. This research use a CMCIT theory for evaluate the students’ satisfaction in effectiveness and efficiency. The data were analyzed using descriptive and inferential statistical analysis. This study examined the extent of respondents' satisfaction related concepts and types of evaluation of online learning. The study also showed that only two types of evaluation of the effectiveness and efficiency of student satisfaction using interactivity in online learning. Overall, the majority of respondents would give satisfaction through efficiency and effectiveness of online learning because they really use ict in their learning.

Peer-review under responsibility of the Organizing Committee of ICEEPSY 2014.

Keywords: Online learning, effectiveness, efficiency, satisfaction.

1. Introduction

Satisfaction evaluation of interactivity for online learning is very important to determining the effectiveness and efficiency of interaction in online learning. The advent of digital technology and the increasing importance of
transmission computer for the higher education have led to online learning through various ways, including electronic mail, the World Wide Web (WWW), the Internet, technology and multimedia. Online learning market is comprised of academic, corporate and consumer. In addition, it also has various aspects including content providers, technology vendors and service providers. The globalization of information currently growing rapidly in tandem with the development of information technology is more widespread. Shaheen et al (2008) showed that the internet offers the opportunity to combine education and economic goals on the same platform can be accessed globally. Jenkins and Hanson (2003) said that online learning is described as a learning facility and this support all through the use ICT. So, online learning such as internet, computers, mobile phones, audio or video used to support teaching and learning in ICT.

The use of technology in education is fast at all levels of education. This suggests that the use of software technology requires interactivity software to attract more consumers’ use online learning in their lives. For example in UUM, students use 'learning zone' to get notes, find their groups and so on. Textbooks, e-mail, portals and two way text based discussion tool widely used in the online program. According to ISO 9241-11 (1998), usability is said to be a matter or applications that can be used by users to specific users to achieve specific goals by means of effectiveness, efficiency and satisfaction in a specified context of use. This study was supported by Berns (2004) and Mehlenbacher, Bennett, Bird, et al (2005) of the effectiveness of accuracy and completeness, and efficiency is soon finished and the satisfaction of continuing to use this application. Ardito, Costabile, Marsico et al(2006) said that have three usability is also used in online learning. Interactivity is very important for online learning in an interesting perception and support for students to enhance online interactivity. In the study conducted, the social interactivity in online learning is very limited because it is written in theoretical studies. In addition, there are also studies that show the effects of social presence and interactive online learning. Online learning experience a lack of interactivity. Most students just do solitary learning system only. This, the researchers want to assess student satisfaction on interactivity in online learning with evaluation of effectiveness and efficiency.

1.1. Related works

Online learning is growing rapidly. Therefore, the number of students involved in online learning is increasing from time to time. Interactive definition is also more limited for identifying the true meaning of interactivity. Wagner (1997) states a list of interaction that needs to be built into learning whether, distance, online or face-to-face environment. Interaction should be design to increase the participation, develop the communications, receive some feedback, improve a clarity and retention, student support and enabling the discovery and exploration, to help a clarify and enable closure. Wagner also said that the interaction can only be valuable if the goal and objective of a particular learning experience to be considered in the design of interaction. Many researchers have different meaning of interactivity. William, Rice, and Roger (1988) argued that interactivity is "the extent to which participants in a communication process have control over, and can exchange roles in, their mutual discussion". According to Pallof and Pratt (1999), communicate and learn with learner to assign with other for their problem and also get feedback or information from other person. This study was also supported by Dede (1996) and Wellman (1999) that communities improve important thinking, learning conclusion or satisfaction by improve the stage of information, learning and knowledge.

According to Benson (2002) and Conrad (2002) identified online learning as a recent of version of learning to increase access to opportunities for students. Many authors explain that not just access online learning but also flexibility, ability and so onto endorse the interaction of that cannot understand the relationship. Online learning is better learning than does not have access to all for learn. Online learning may surmount the travel and time constraints. Online learning provides a potential for new research environmental to make it easier to enter into contracts with other students during the review process is done. According to Dr. Ruth Brown (2001), there are three levels in building community in the online courses or online learning. First level is a student gets acquainted. Second, the students began, through interaction, to find similarities or differences between them and began to interact with course contents. At the third level, students also began to support each other and take their friendship off the course.
The effectiveness of this learning community can be seen when all experts share ideas and think about the processes together. The online communities in the work are best when the members enter into a relationship with get how to identify each other. This can take part in an online discussion about the learning material, and to support each other through learning and understanding (Silvers, P., O'Connell, J., & Fewell, M., 2007). Efficiency is types of usability. Mueller (2009) said that efficiency means in a result-oriented group interaction, the time taken to interact and how to interact and care mean that the issues discussed. In other words the interaction between the groups itself.

1.2. Methodology

Methodology that is used based on Input-Process-Output (IPO) model paradigm. The use of IPO methodology has been adopted to explain the Computer Mediated Communication Interactivity Theory (CMCIT) that use of researcher for featured in this study. CMCIT was developed based on the methodology IPO. The researcher uses quantitative than qualitative. This is because researchers use instruments such as questionnaires and achievement tests to collect data for the study and the sample size is larger. We can see the IPO methodology in figure 1.

<table>
<thead>
<tr>
<th>INPUT</th>
<th>PROCESS</th>
<th>OUTPUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify the valuation of interactivity in online learning, the questionnaire was built based on past studies and test the reliability of the questionnaire.</td>
<td>Questionnaires will be distributed to the respondents who were selected and after that, the data will be collected.</td>
<td>Data will be analyzed to find out the results using SPSS version 16 for achieving the proposed hypothesis. The analysis results will be known through correlation and regression.</td>
</tr>
</tbody>
</table>

![figure 1: research methodology paradigm (IPO model)]

Input

Cohen and Bailey (2007) said Input factors are the factors that can be manipulated to change the process and the result. McGrath (1964) also argues these factors can be input at the level of individuals, groups or the environment. Instead, Gladstein (1984) only distinguish between these factors in the group stage and the factors at the organizational level, while Cohen and Bailey (2007) suggests the environment, organization, group, and task factors. Group size and structure, and the levels "coherence" (McGrath, 1964) or the composition of the groups (Gladstein, 1984), and the period (Cohen & Bailey, 2007) is considered as factors input group on stage. In this IPO model is develop the questionnaire based on CMCIT theory. The questionnaire was developed from material discussed and tested previously. A total of 24 questions will be provided in the questionnaire where respondents are required to answer all the questions that have been provided. The instrument used is based on a scale of attitude, the Likert scales. Input the IPO model is the process of selecting a questionnaire and make decisions based on research needs to be conducted. In this phase, the type of questionnaire performed using a five point Likert scale with the problem and follows the objective of this study. Researchers distribute 113 questionnaires to selected respondents. The questionnaires distributed sampling convenient. Besides that, the reliability of the questionnaire also performed on 30 respondents to test the Cronbach alpha.
Process
The information processing is an important characteristic in completing tasks and problem situations (Hinsz et al, 1997). In one of the subtopics, the processing of a form which is described in more detail is playing a special role through its influence on the output in the framework of input-output processes. In the "process" this questionnaire containing 26 questions was distributed to the selected sample. Study made was in School Of Computing, Universiti Utara Malaysia (UUM). Selected sample is based on convenient sampling techniques. Respondent selected is because they are more vulnerable to online learning than students from other majors. Distribution of the questionnaire was conducted early in May. Researchers collect data immediately by giving respondents answered for 10-15 minutes on the effectiveness and efficiency of interactivity in online learning can give satisfaction to them or not.

Output
Output or the outcomes is the result of the process and conceptualized in a way that various dimensions. Output can occur at various stages such as individuals, groups, the unit, or organization (Cohen & Bailey, 2007). Output is usually defined by how far the goal achieved (Brodbeck, 1996). At the output, the data will be analyzed using Statistics for Social Sciences (SPSS) Version 16. Data will be analyzed based on the objectives and the hypotheses that have been identified before. CMCIT use of theory in the IPO model gives researchers an easy way to do the analysis of the variables used. In this output, the researchers use correlation and regression in knowing the results of the tested variables. In addition, the mean, standard deviation and frequency are also taken from the results obtained; the researcher can make inferences about student satisfaction of interactivity in online learning.

Figure 2 shows a CMCIT theory that using the IPO methodology. CMCIT theory is used to explain the variables are constructed using the survey instrument and analyzed by the research objectives. CMCIT adapted from Ronald Mueller to fit the desired variables.

![Figure 2 : CMCIT theory](image)

a) Effectiveness
Effectiveness known as the accuracy and completeness of the way consumers achieve a special goal. Frokjar (2000) states that "the effectiveness indicators, including quality of solution and error rates." According to Muller (2009), the effectiveness of this is a content that can build a fairly extensive formative. All content, issues and ideas were examined by means of an effective and critical. ISO 9246-11 (1998) suggests the effectiveness is a stated goal is to be achieved with precision and perfection. The effectiveness of this learning community can be seen when all experts share ideas and think about the processes together. The online communities in the work are best when the members enter into a relationship with get how to identify each other. This can take part in an online discussion about the learning material, and to support each other through learning and understanding (Silvers, P., O'Connell, J., & Fewell, M., 2007).
b) **Efficiency**

Nielsen (1993) said that efficiency should be made using the system within a reasonable time and the system should be very productive. Besides, Shackel (1991) also argue the performance of its duties is also a potential access to utilities. According to Mayer (1985), efficiency achieved can be understood by trying to achieve most of the benefits required in relation to a given level of expenditure. Efficiency is an alternative way to choose in reaching the final standard.

c) **Satisfaction**

Nielsen (1993) also said consumers should be enjoy using the system and are satisfied with it. Beside, Astin (1993) states that satisfaction from the perspective student of a college or university about their experiences, and interests can be seen through the education received from an institution. In addition Levy (2003) also explains that conclusion in a research study carried out on 200 students who are pursuing online learning, student satisfaction with online learning is an important factor to measure the effectiveness of e-learning.

### 1.3. Result

This decision deals with the results of studies that have been conducted. The results are divided into two parts: a descriptive discussion of the data analysis and results. Result covers descriptive demographic, while the inferential statistics will be used to test the hypotheses. Table 1 shows the demographic of respondent.

<table>
<thead>
<tr>
<th>Item</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>71</td>
<td>62.8</td>
</tr>
<tr>
<td>female</td>
<td>42</td>
<td>37.2</td>
</tr>
<tr>
<td>Course</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IT</td>
<td>75</td>
<td>66.4</td>
</tr>
<tr>
<td>ICT</td>
<td>38</td>
<td>33.6</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malay</td>
<td>49</td>
<td>43.4</td>
</tr>
<tr>
<td>Indian</td>
<td>1</td>
<td>.9</td>
</tr>
<tr>
<td>Chinese</td>
<td>2</td>
<td>1.8</td>
</tr>
<tr>
<td>Other</td>
<td>61</td>
<td>54.0</td>
</tr>
</tbody>
</table>

Data collected from respondents will be analyzed. The data will be analyzed according to the objectives and hypotheses that have been identified. The variables that used will be analyzed using regression to determine how impact the independent variables affect the dependent variable. This research performed using SPSS V16. Hypotheses that are used can be seen through the results of the study in table 2.

**Table 2 : Relationship between Efficiency with Interactivity**

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
</tr>
<tr>
<td>(Constant)</td>
<td>10.035</td>
<td>2.189</td>
</tr>
<tr>
<td>EFFECTIVENESS</td>
<td>.785</td>
<td>.119</td>
</tr>
<tr>
<td>EFFICIENCY</td>
<td>.265</td>
<td>.099</td>
</tr>
</tbody>
</table>

Dependent Variable: satisfaction  
Adjusted R square = 0.492  
ANOVA: F = 55.25 significant .000

Based on analysis, the result shows the F value is equal to 55.25 and the significant value (p = .000). It can be clarified that there is significant value effectiveness and efficiency between student satisfactions. According the result, the adjusted R square value is equal to 0.492. It means that, effectiveness and efficiency accounted for the satisfactions with the value of 49.2%. The t value for effectiveness is 6.622 and efficiency is 2.673 and the significant value of effectiveness and efficiency in
coefficient is .000 which shows that the relationship effectiveness and efficiency between satisfactions is significant. Effectiveness is effect 0.785 and efficiency is effect 0.265 to the satisfactions; however there is 10.035 influenced by other factors effect to satisfaction. So, that means the effectiveness more effective than efficiency. The hypothesis is effectiveness positively impact to satisfaction of interactivity in online learning.

1.4. Recommendation

As a practical contribution, the researcher suggests item measure to assess the size three main features usability of online learning such as effectiveness, efficiency and satisfaction that are directly related to this field. This size of the item will be able to help teacher and student learning run usability evaluation involving samples in a great community technology. However, this research also has some limitations. While usability is made up of various properties discussed in usability engineering, measurement tools proposed in this research covers only three of them. Besides, number samples in this research are required to continue to represent the entire better online learning to the user. When a limited number, this study may not apply satisfaction factor analysis allows the researchers to further investigate the relationship between structure and related items. This is limitations that describe again studies that build for evaluation of the long model to cover more of these attributes such as memorability, flexibility, error tolerance, adaptability, and helpfulness. In addition, the future studies need to raise the sample size that is not only to more general confirmation that the appliance measurement but also to continue to ensure the validity of the asset structure. Especially equation modeling the structure with a large sample size will allow users to run satisfaction factor offers analysis in the more critical to ensure the validity of the change.

1.5. Conclusion

This study extended online learning by testing the effect of interactivity on student satisfaction with effectiveness and efficiency. The researcher also provide support to extend interactivity to online learning because of pre-existing expectations of student and the desire to website has no direct connection with their clear satisfaction website. Interactivity in online learning is gaining acceptance in higher system as use it to contribute to the experience. Booth (1989) argues that it is based on online learning by using the CMCIT; care should be taken to make sure that the interaction of the students, instructors and content to be effective. The effectiveness and the efficiency is positively impact to satisfaction of interactivity in online learning. In this research, the result shows that the effectiveness is more give impact to satisfaction than efficiency. It means the effectiveness of interactivity can give satisfaction to students who use online learning.

Acknowledgment

This work was supported by a school of computing, Universiti Utara Malaysia, kedah. My gratefulness to my supportive and helpful students for assisting and guiding me in the completion of this research. I would like to express my appreciations to all my friends, colleagues, everyone who has helped me in this journey and also the anonymous reviewers for their helpful comments on earlier drafts of this paper

References


