









### UNIVERSITI TEKNOLOGI MARA

## **EVALUATING THE USABILITY OF FTMSK** ONLINE TEST SYSTEM USING SHACKEL'S MODEL



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### ABSTRACT

One of the most important characteristic of an online learning system is its ability to access the ease of use of the system. Nowadays, many types of application for elearning have been developed. However, most of the software developers only focus on developing the system but not concern about the usability of the system. In reality, the usability of the system is an important aspect of system development. Poor usability will effects the utility of the system and will wasted the user's time, causes worry and frustration and discourages further to use the system. Therefore, usability testing has been considered as a potential method to evaluate a system. Based on Shackle's Model of usability, the questionnaire is designed to evaluate the FTMSK Online Test System. The questionnaire is based on the four usability factors such as effectiveness, learnability, flexibility and attitude to determine students' and lecturers' view on the online test system. The usability testing also has been conducted with the lecturers as a test subject. The result of this study showed that the overall level of the usability for four construct (effectiveness, learnability, flexibility and attitude) in student's point of view are in the acceptable level (mean=3.9279). While, from the lecturer's point of view, the overall level of the usability are also in the acceptable level (mean=3.8331). From the research, we also found that both students and lecturers acceptance toward the online test system is most highly in positive level. The gender and online test experience do not influence lecturers' and students' acceptance. This is because most of them are exposed to the information and communication technology. In conclusion, the usability testing method has an ability to determine the level of user's acceptance on using the online test system.

















### Candidate's Declaration

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any other degree of qualification.

In the event that my thesis be found to violate the conditions mentioned above, I voluntarily waive the right of conferment of my degree and be subjected to the disciplinary rules and Universiti Teknologi MARA.

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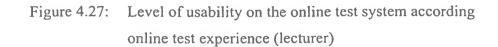












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### **CHAPTER 1**

### INTRODUCTION

#### 1.1 Background of the Research

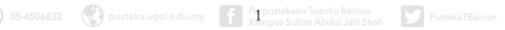
The Internet and World Wide Web have grown rapidly in the past decade and have come to play a major role in the education system. The use of the internet for teaching and learning purposes has received increasing attention from educators over the recent years. They used the electronic learning (e-learning) as a method for delivering courses. In Malaysia, the wave of e-learning is blowing across the entire education system from public and private institutions (Ndubisi, 2004). According to Iahad, Kalaitzakis et al. (2004), e-learning refers to the process of learning or training online, meaning acquiring knowledge via Internet and the Web. There are three main factors that encourage the higher education institutions to get involved with elearning such as the increasing number of students, the need for life-long learning and the need to prepare students with knowledge and skills for succeeding in the knowledge economy (Irvine, 1998; Harasim, 2000) as cited in Iahad, Kalaitzakis et al. (2004).

Nowadays in the market there are many educational software specifically designed for (e-learning) such as WebCT, Blackboard and Prometheues (Burgess, 2003). Each of these software offers similar components such as course note posting, assignment submissions, quizzes and communication features. It is because they believed the advances in electronic technologies such as Internet and World Wide Web have opened new avenues for student to learn in a collaborative ways.

According to Relan and Gillani (as cited in Lewis, 2002) the online learning environment is broadly interpreted as an instructional delivery method in which the





















Internet is the medium of the delivery. There are two ways to delivery online learning such as:

- Synchronous: communication in which interaction between learner-instructor and learner-learner is simultaneous.
- Asynchronous: communication in which interaction between learner-instructor and learner-learner does not take place simultaneously (anytime, anyplace).

By using the delivery method of online learning, higher education can use the online learning platform to create an online assessment. Student assessment is one of the most important elements in an education system. Appropriate assessment strategies can have comprehensive implications for faculty development and student learning. The purpose of assessment is to provide a measurement of student performance and give constructive feedback to individual students. According to Barbosa and Garcia (2005), the importance of online assessment is that educators could ensure time saving benefit since the system could have the characteristic to automate the marking. It also can minimize the academic dishonesty. To avoid this, a widely used method is to have an online database of assessment as a part of a test bank that allows generating random tests from randomized items (Barbosa & Garcia, 2005). In addition, online assessment also allows in improving the assessment process, quick feedback to students, creates consistent and standardized assessment, student progress can be monitored and the assessment activity can be documented.

### 1.1.1 FTMSK Online Test System

Two main purpose of an online test are to evaluate student's progress and to help students to learn (Mornar, Bozic & Zokovic, 2003). Furthermore, lecturer can use tests to indicate how well students have achieved the goals and objectives of the learning event. Testing students online is challenging because as a lecturer, he or she must strike the right balance between the complexity of the question and the feasibility of answering the question in a limited amount of time (Kumar, 1999).





















According to Driscol (as cited in Mornar et al., 2003) online quizzes and test are among the most commonly used types of asynchronous interaction. Asynchronous interaction will allow students and lecturers to communicate in anytime at anyplace. When students completed a test, their answers are automatically recorded and graded.

One of the existing assessment systems that currently being used at the Faculty of Information Technology and Quantitative Sciences (FTMSK) is Cisco's Online Test. According to Nurul (2005) the Cisco Academy Program is a comprehensive elearning program that provides instructionally supportive-assessment with immediate and ongoing feedback to lecturers and students. However, assessment capabilities are delivered by CLI Virtuoso, an authoring and content delivery system which is conducted by Cisco. CLI Virtuoso stores assessment questions and results for students according to mastery of the certain subject (Cisco Networking Academy Program, 2002). The test questions are also limited and depend on Cisco's test bank question only.











The faculty has developed other online test system which be can integrated with the Network Based Project Learning (NBPL) system called FTMSK Online Test System. The design of the FTMSK Online Test System is based on cognitive domain of Bloom's Taxonomy. The questions are categorized based on the cognitive levels in term of knowledge, comprehension, application and analysis (Nurul, 2005). This system can help the lecturers to assess their student's performance through online and assessment process can be done easily and quickly. The online test system has three main menus for lecturers to evaluate their student's performance such as menu addition, menu view and menu report.

With the intention of that, the purpose of this research is to evaluate the usability of the Online Test System Prototype that currently being developed by the faculty. The usability evaluation of the system is important to ensure that the system is not only functions as expected by the users but is also usable and can be accepted by lecturers and students.



















### 1.2 Statement of the Problem

Recently, the number of systems, software and web sites from the educational software industry has significantly increased. The reason for the increase is closely related to the use of the Internet for teaching and learning in online environment. But, why most of the systems, software and web sites in use today is unnecessarily difficult to understand, hard to learn and complicated to use (Bevan and Macleod, 1994). This happened because many of the organizations and developers ignored the importance of the usability during the development phases and procuring the product. According to Olsson (2002) because of the web development is continues grow as if out of control, the usability aspects more or less have been left out. This phenomenon cause may be the fact that web designers are working as quickly as possible. They build as many web sites as possible because of the overheated demand and therefore do not have time or simply do not need to usability test their designs. Olsson (2002) also state that people leave web sites all the time because of usability aspects, as they get stucked and they may never come back.

When the software is design for educational use, additional principles become important such as the design of learning activities and the learner's ability to control sequence, pacing, presentation medium and level of difficulty (Hannafin, 1989). But, in other hand, Storey, Philips et al. (2002) reported that even though several formal and informal case studies have been conducted, none of them have paid attention on both usability of the learning tools and the impact on the potential users such as students, instructors and course administrators. As a result, Miller (2005) found that so many e-learning applications fail because of the decision makers have a poor understanding of usability, unaware of the importance or not consider it worthy of time and effort. Koohang (2004) believed that little research has been done regarding the usability of e-learning courseware and its significance in the e-learning instructional design process. As a consequence, difficulties to use software will waste the user's time, causes worry and frustration and discourages further use of the software (Bevan and Macleod, 1994).





















Miller (2005) also said even though many organizations have made great strides in their ability to develop and deliver e-learning programs to their employees, customers and suppliers, the usability of these e-learning applications is often lacking or entirely overlooked. There are a large number of reasons for the lack of usability adoption such as quality of courses, relevancy of content, comfort level with the technology, availability of technical support and ability to interact with peer learners. But the major contributor often left off this list is poor usability, which is characteristic of many e-learning applications.

Long, Barnard et al. point out (as cited in Goodwin, 1987) that poor usability may put in risk the utility of a system if it causes some users to give up on it. This problems will cause the current data in the system may be at risk when a computer system is difficult to use.

#### Research Question 1.3

This research is aimed to discover and understand the usability factors such as effectiveness, learnability, flexibility and attitude of using the Online Test System as an instrument for student assessment. In addition, this research also wants to determine whether the system can be accepted by the lecturers and students. This research examined the following research questions:

- 1. Do the factor of effectiveness, learnability, flexibility and attitude will affect the students' and lecturers' acceptance in using the online test system?
- 2. Is gender and online test system influence usability factor?
- 3. What is the level of lecturers' acceptance toward using the online test system as a teaching and learning tool?





















#### 1.4 Research Objectives

The objectives of this research are:

- 1. To determine the factors of effectiveness, learnability, flexibility and attitude that will positively or negatively affects the lecturers' and students' acceptance in using the online test system.
- 2. To determine whether gender and online test experience influence usability factor.
- 3. To determine the level of lecturers' acceptance toward using the online test system as teaching and learning tool.

### Significance of the Research 1.5

The research explores the lack of system or software usability especially in educational software to support e-learning. Usability features should not only allow people to efficiently manipulate the interactive software, but should also be appropriate for the intended learning task (Costabile, De Marsico, Lanzilotti, Plantamura & Roselli, 2005). Educators and researchers agree that the computer industry tends to employ usability terms very loosely (Mandel, 1997).

The usability testing of computer system is an important aspect of system development and acquisition which is of interest to students, educators, information system professional, strategic managers and developers. In addition, the research will help to identify a number of problems that can illustrate the importance of usability testing as a standard practice when evaluating the use of technology in education.

The research can also be a guideline for the educators before they want to implement any education system in their organizations. It is because usability is a part of evaluation to improve the quality and effectiveness of system features. For the developers, they can use the research as a guideline before they develop any product, software or system.





















#### 1.6 Scope and Limitations of the Research

In this research we will only consider usability factors such as effectiveness, learnability, flexibility and attitude in evaluating the human factors issues based on Shackle's Model. The usability testing is based on the functional aspects of the online test system and will ignore the user interface of the system. In usability testing was only record the task completion time and number of errors made by users. The participants in this study are students from two master programmes (Master of Science in Information Technology and Master of Computer Science) and selected lecturers from FTMSK.

#### 1.7 Structure of the Thesis

### **Chapter 1: Introduction**

This first chapter highlights the background of the research, statement of the problem and subsequently outlines the research questions and objectives of the study. It also discusses the significance of the study, scope and limitations of the study.











### Chapter 2: Literature Review

In the second chapter, it will discuss the usability model that can be used to evaluate product, usability benchmark, usability evaluation method and technique, usability testing and reviews of study on usability in e-learning.

### Chapter 3: Research Methodology

The third chapter will outline the methodology of the study. It involved the activities in usability testing such as establish test objectives, prepare test plan, conduct the usability, analysis the data and document the result.

### Chapter 4: Result and Analysis of Data

The fourth chapter presents the result of findings. The descriptive analysis will be discussed at the beginning of the chapter and followed by statistical analysis on each part of the survey.





















### **Chapter 5: Discussion of Findings**

The fifth chapter will formulate and conclude the analysis discussed in the fourth chapter.

### Chapter 6: Recommendation and Conclusion

Finally, the last chapter will conclude the outcomes of the study and recommendations for future research.

















