The Effectiveness of MyGuru2 Asynchronous Online Discussions and Factors That Influence Students' Adoption

by
Mahizer Hamzah

An Applied Dissertation Submitted to the
Abraham S. Fischler School of Education
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Education

Nova Southeastern University
2012

Approval Page

This applied dissertation was submitted by Mahizer Hamzah under the direction of the persons listed below. It was submitted to the Abraham S. Fischler School of Education and approved in partial fulfillment of the requirements for the degree of Doctor of Education at Nova Southeastern University.

Ligia Leite (via) — 8-6-12

Ligia Leite, EdD
Committee Chair — Date

Charles Schlosser (via) — 8-6-12

Charles Schlosser, PhD
Committee Member — Date

[signature] — 8-6-12

Program Professor Review
Applied Research Center — Date

[signature] — 8/8/2012

Ronald P. Kern, PhD
Associate Dean — Date

Acknowledgments

My applied dissertation project would have been very difficult without the support from a number of individuals. I would like to thank my wife, Norizan, and kids for their patience. I am very grateful to my committee chair, Dr. Leite, who provided steady guidance and support. I am also very much thankful to my dissertation committee Dr. Schlosser and as well to all the ITDE program professors, Dr. Simonson, Dr. Bucker, Dr. Curless, Dr. Orellana, and Dr. Lewis.

Finally, I would like to express my gratitude to students who participated in my research. This study would not have been possible without them

Abstract

The Effectiveness of MyGuru2 Asynchronous Online Discussions and Factors That Influence Students' Adoption. Mahizer Hamzah, 2012: Applied Dissertation, Nova Southeastern University, Abraham S. Fischler School of Education. ERIC Descriptors: Computer Mediated Communication, Internet, Teacher Education, Discussion Groups

A university in Malaysia has been using MyGuru2 as their learning management system for nearly 5 years, and the number of courses that use the online discussion tool in MyGuru2 has increased every year. Therefore, the purpose of this study was to determine the effectiveness of the MyGuru2 asynchronous online discussion tool and identify the core factors that influenced student adoption of MyGuru2 asynchronous online discussions after 5 years of use.

A mixed-methods approach with an explanatory design, specifically the follow-up explanations model, was used for this study. The data-collection process was divided into two phases: a quantitative study using the survey method and a qualitative study using semistructured interviews.

The results of the study indicated that the use of the MyGuru2 online discussion tool has positively impacted student learning. Students reported that this online discussion tool was easy to use and very useful in helping them with their learning. Among the 5 attributes of innovation (relative advantages, compatibility, complexity, trialability, and observability) that influence student adoption, compatibility and complexity had the greatest influence on the students' adoption of the MyGuru2 online discussion tool with 4 underlying dominant themes: freedom of learning, students' needs, usability, and support.

Table of Contents

Page

Chapter 1: Introduction 1
- Background and Overview 2
- Statement of Problem 3
- Definition of Terms 4
- Purpose of the Study 5
- Summary 7

Chapter 2: Literature Review 8
- Study Site in Malaysia 8
- E-Learning System at the Study Site 9
- Overview of Online Discussions 11
- Asynchronous Online Instructional Discussions 16
- Technology Acceptance Model (TAM) 20
- Research on Technology Acceptance 22
- Overview of Diffusion of Innovations 25
- Attributes of Innovation and Rate of Adoption 27
- Research on the Attributes of Innovation 30
- Summary 32
- Research Questions 33

Chapter 3: Methodology 34
- Population and Sample 34
- Instruments 35
- Procedures 38
- Data Analysis 39
- Delimitations 41
- Summary 41

Chapter 4: Results 43
- Demographic Analysis 43
- Quantitative Data Analysis and Findings 44
- Inferential Statistics 50
- Qualitative Data Analysis and Findings 51
- Summary 56

Chapter 5: Discussion 57
- Summary of the Study 57
- Interpretation of the Findings 57
- Discussion of the Findings 61
- Implication of Findings 64
- Limitations of the Study 65
- Recommendations for Future Research 65

References 67

Appendices

A Survey Questionnaire 74
B Interview Questions 79

Tables

1 Cronbach's Alpha for Each Variable 37
2 Group Meeting Schedule 39
3 Frequency and Distribution of Participants' Background Information 40
4 Participant Reported Computer Skills ($N = 480$) 44
5 Participant Reported Internet Usage for Academic Purposes Per Week ($N = 480$) 45
6 Factors Affecting the Adoption of the MyGuru2 Tool and Their Relative Importance ($N = 480$) 51
7 Correlation Results Between Perceived Usefulness and Perceived Ease of Use With Computer Skills 52
8 Correlation Results Between Perceived Usefulness and Perceived Ease of Use With Hours Use Computer Per Week 52
9 Correlation Results Among Independent Variables 53

Figure

1 The Study Framework 6
2 The Design and Development Committee 10
3 The use of MyGuru2 by Students 11
4 Technology Acceptance Model 21
5 A Model of the Five Stages in the Innovation-Decision Process 26
6 The Distribution of Participants According to the School in Which They are Studying 44
7 Mean Responses for Each Survey Item Targeting Perceived Usefulness 46
8 Mean Responses to Each Survey Item Targeting Perceived Ease of Use 47
9 Mean Responses for the Survey Items Measuring Relative Advantages 47
10 Mean Responses for Each Survey Item Measuring Compatibility 48
11 Mean Responses for Each Survey Item Measuring Complexity 49
12 Mean Responses to Each Survey Item Measuring Trialability 49
13 Mean Responses for Each Survey Item Measuring Observability 50

Chapter 1: Introduction

Teaching approaches within the field of education, including teacher preparation and the role of the instructors and students within the classroom, have undergone many changes over the last few years. In fact, typical educational methods employed in the classroom have evolved from the traditional "chalk-and-talk" approach, which uses charts, models, mockups, transparencies, and slides, to the more recent use of advanced technology, including visualizers, smart boards, computers, and the Internet. The emergence of the Internet has opened doors to the possibility for a new age of distance learning (Yeh & Lahman, 2007). Moreover, due to the paradigm shift caused by the Internet and web-based education, many higher education institutions have moved from only offering more traditional face-to-face interaction in the classroom to a greater degree of web-based interaction.

Allen and Seaman (2007) reported that more than 65% of higher learning institutions in the United States offered some form of web-based learning. The number of students engaged in this type of distance education increased by 9.7% between 2005 and 2006. Moreover, Charmonman (2005) added that most universities and colleges within the Association of South-East Asian Nations, including Malaysia, were also offering web-based instruction (WBI) or web-based degree programs. Specifically, in Malaysia, many institutions have begun offering e-learning opportunities either as part of their traditional instructional approach or specifically for distance education due to the increased demand for higher education by the citizens of Malaysia (Goi & Ng, 2009; Khalid, Yusof, Heng, & Yunus, 2006).

Despite its potential superior design, a web-based innovation for education can only be considered successful if it is widely adopted, and those who are directly involved

with the design and distribution of such innovation must work diligently to maximize its adoption rate (Chigona & Licker, 2008). However, the first step to developing a plan to maximize the adoption rate for any innovation is to know the aspects that affect its adoption. Therefore, the technology industry should be very interested in scholarly work that focuses on factors affecting the adoption of specific innovations. Indeed, the adoption of technology for teaching and learning, including acceptance (Davis, 1989) and the effects, incentives, and barriers to its usage (Beggs, 2000), has been widely studied. From the perspective of innovations in the field of education, the decision regarding whether Malaysia wants to use a web-based environment or not in higher educational institutions and the factors involved in this process can be analyzed using theories associated with the adoption of innovations (Rogers, 2003).

Background and Overview

The university in Malaysia that was the site of this study implemented a blended learning environment as an alternative to more traditional classroom interactions in 2000. Specifically, they began using WebCT as their first learning management system (LMS). In November of 2004, WebCT was replaced with a locally developed LMS called MyGuru, and, in 2006, the university once again updated its LMS to MyGuru2, another locally developed LMS. This latest LMS (MyGuru2) consists of the following features or online learning tools: course information, announcements, assignment information, chat capabilities, online quizzes, discussion boards, file sharing, glossaries, and wikis.

The use of MyGuru2 by instructors and students has been steadily growing over the past few years. Instead of solely using face-to-face interactions within traditional classroom settings, instructors have now added online discussion boards using MyGuru2 as part of their teaching activities. For traditional face-to-face interactions, learners

typically meet with their instructors in a more formal classroom situation. In contrast, an online discussion board allows learners to meet with their instructors and peers via a web-based system. Moreover, students engaged in web-based learning also have more control over every aspect of the learning process, including time spent on assignments given by their instructors, training time, and revision time (Brown, 2001). Horton (2000) stated that online discussions give students a greater chance to communicate with their peers compared to an ordinary class meeting; this increased learner-to-learner interaction can be very beneficial to the learning process. Additionally, an online discussion is not fixed in terms of time or space; students can access the Internet at anytime and anyplace, participate in threaded discussions or general discussions, and communicate with their instructors if they encounter any problems with their course work.

Statement of Problem

MyGuru2 has been used for online discussions at the university for nearly 5 years, and the number of instructors who use this online forum to support their face-to-face classroom instruction has increased every year. Specifically, in the first semester of the 2006-2007 academic year, only 446 courses utilized this system; this number increased to 3,484 courses in the first semester of the 2009-2010 academic year (Information and Communication Technology Center, 2009). In spite of the increased number of courses using this system, there is no study has been done to determine the effectiveness and identify the core factors that influence students' utilization rate for MyGuru2 online discussions. Ozkan and Koseler (2009) found there was not much research assessing the use of LMSs within educational institutions as web-based e-learning systems or as supportive tools in blended learning environments. Additionally, Chang (2006) revealed a research gap regarding online discussions as part of a traditional course. Eccles (1991)

and Hofmann (2006) emphasized the importance of assessment and continuous improvement for web-based learning systems even when the program is past the pilot phase; indeed, problems must be identified and communicated immediately before they can be addressed.

Definition of Terms

Online discussion. Also known as an online forum, this is a type of interaction facilitated by a computer network via a LMS.

Asynchronous online instruction. This is a form of instruction that does not require students and instructors to participate at the same time (Branon & Essex, 2001; Sabau, 2005). Moreover, Palloff and Pratt (2007) defined asynchronous online education as

> a type of communication that can occur at any time and at irregular intervals, meaning that people can communicate online without a pattern of interaction. It is the predominant mode of communication used in email, in Usenet groups, and on bulletin boards and websites. (p. 271)

Perceived usefulness (PU). Davis (1989) defined this term as "the degree to which a person believes that the use of a particular system would enhance his or her job performance" (p. 320).

Perceived ease of use (PEU). Davis (19898) defined this term as "the degree to which a person believes that using a particular technology will be free of effort" (p. 320). Even though users may find the technology useful, they may also find that the technology is not easy to handle and they are forced to master a necessary set of skills before they can use it (Davis, 1989).

Adoption. Rogers (2003) defined this term as "a decision to make full use of an innovation as the best course of action available" (p. 21).

Rate of adoption. Rogers (2003) defined this term as "the relative speed with which an innovation is adopted by members of a social system" (p. 23).

Purpose of the Study

The purpose of this study was to evaluate the effectiveness and adoption rate among students of an asynchronous online instruction and discussion tool in MyGuru2 after nearly 3 years of use at the university that was the site of this study. When determining the effectiveness of an information system project, user acceptance is an important factor to consider (Abdalla, 2007; Akkoyunlu & Yilmaz-Soylu, 2008; Davis, 1993; Irons, Keel, & Bielema, 2002; Selim, 2003). Therefore, to evaluate the effectiveness of online discussions via the MyGuru2 online discussion tool, this study employed the Technology Acceptance Model (TAM; Davis, 1989), which emphasized the variables PEU and PU. In this study context, *effectiveness* was defined in terms of student perception of the MyGuru2 online discussion tool. Additionally, to identify factors that influenced the student adoption of the MyGuru2 asynchronous online discussion, this study used the diffusion of innovations theory by Rogers (2003), which emphasized the attributes of innovation. In other words, the TAM and the diffusion of innovations theory was the underlying theoretical framework for this study (see Figure 1).

TAM, which was proposed by Davis (1989), explained the two key factors (the PU and PEU) that affected the student perception of MyGuru2 online discussions at the university. Davis (1989) posited that the PEU and the PU are key indicators of a consumer's intention to adopt a new technology. In the case of this study, PU indicated the tendency of students to use or not use MyGuru2 online discussions in their learning. Additionally, PEU was indicative of the perceived level of effort necessary to use the

MyGuru2 online discussion tool. Specifically, if students believed that the MyGuru2 online discussion tool took little to no effort to learn and use, they were more likely to use and accept the MyGuru2 online discussion tool. PEU also influenced PU; specifically, if students believed that the MyGuru2 online discussion tool was easy to use, they were more likely to consider it to be useful as well (Davis, 1989).

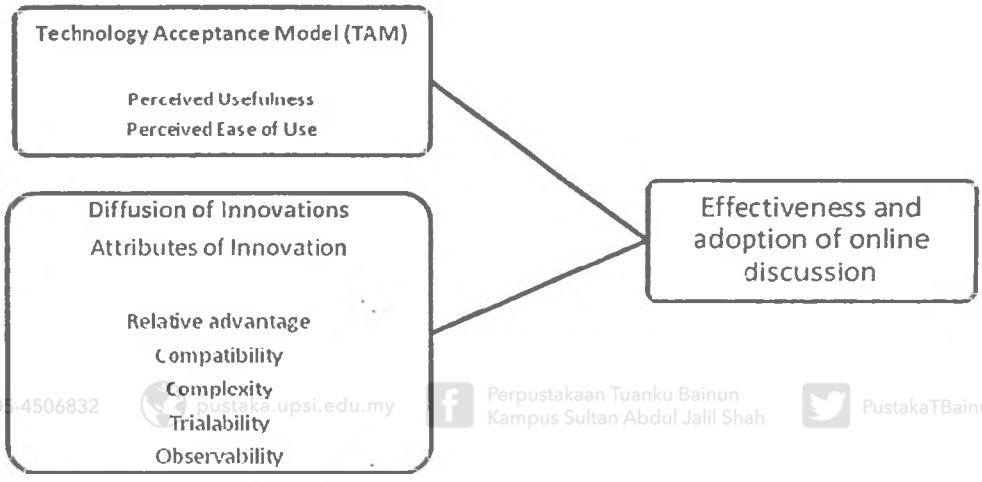

Figure 1. The study framework.

The diffusion of innovations theory will explain why the subject university students incorporated or ignored the MyGuru2 online discussion tool in the educational process. According to Rogers (2003), the rate of adoption can be predicted by the following five innovation characteristics: relative advantages, compatibility, complexity, trialability, and observability.

The result of this study will provide systems and instructional technology developers with guidelines for improving MyGuru2 by identifying the factors that diminished the perceived effectiveness of the online discussion. Also, instructors who were using or would use this asynchronous online discussion tool would gain a better understanding of the average student perception of online discussion tools and ways in

which they could improve the implementation and explanation of the use of online discussion tools to support their teaching.

Additionally, this study provided valid results due to the adoption of the mixed-methods research design, which minimizes weaknesses that may arise from the use of a single research method (Creswell & Clark, 2007; Tashakkori & Teddie, 1998). Via the mixed methods with an explanatory design, the study was divided into two sequential phases: a quantitative study using the survey method and a qualitative study using semistructured interviews.

Summary

This chapter presented the study background, the significant problems, and the purpose of the study on the effectiveness of the MyGuru2 online discussion tool and the factors that influenced student adoption. The TAM, which emphasized PU and PEU, was used to evaluate the effectiveness of the MyGuru2 online discussion tool. Moreover, the diffusion of innovation theory was used to identify the factors that influenced student adoption.

A mixed-methods research design was used to gathered data from students at the university via survey and interviews. The information gathered from this study may help to improve the MyGuru2 online discussion tool and support the use of this system in the teaching process.