Shu-Te University

College of Informatics

Graduate School of Information Management

Master

Factors Effect on the Benefits of E-learning System in Enterprises in Nam Dinh Province, Vietnam

Student: Pham Luong Khanh

Advisors: Dr. Shing H Doong

February, 2011
Factors Effect on the Benefits of E-learning System in Enterprises in Nam Dinh Province, Vietnam

Student: Pham Luong Khanh
Advisors: Dr. Shing Hwang Doong
Dr. Nguyen Linh Trung

A Thesis
Submitted to the
Graduate School of Information Management
College of Informatics
Shu-Te University
In Partial Fulfillment of the Requirements
For the Degree of
Master of Science
In
Information Management

February 2011
Factors Effect on the Benefits of E-learning System in Enterprises in Nam Dinh Province, Vietnam

Adviser: Dr. Shing Hwang Doong

Authorization Items:
A. The graduate student and the adviser are called the grantors in the follows.
B. The accessed times and authorized ways of the electronic file
   a. Inside campus: The grantors authorize the following option to Shu-Te University free of charge (please chose one of the following options, if none, the full text of thesis will be made public or upload immediately):
      □ Immediately  □ After 1 year  # After 2 years
   b. Outside campus:
      1. Please chose one of the following options (if none, the full text of thesis will be made public or upload immediately)
         □ Immediately  □ After 1 year  # After 2 years
      2. Please chose one of the following options (if none, the full text of thesis will be made free of charge)
         □ Charge  # Free of charge
      (If you chose “Charge”, the fee of authorization will be donated to Shu-Te University.)
C. If the grantors agree to disclose the electronic full text of thesis, Shu-Te University will preserve the right to reprocess the thesis by miniature, digitalization, or other ways. The full text of thesis is allowed to be searched, browsed, downloaded, transmitted, printed, etc. through PC, Internet, wireless network, or other transmission devices. Shu-Te University has the right to authorize the third person to reprocess the above described items.
D. All the authorizations described above are authorized non-exclusively; the grantors still own the copyright of the thesis. The grantors have to assure that the thesis is an original creation, do not encroach on the copyright of the third person, and have the right to authorize the above described items. The grantors have to take all the responsibilities if they encroach on others’ copyright and violate the laws. The authorized unit will not have the responsibility of the illegal behavior.
E. The grantors agree that Shu-Te University has the right to alter the information in the ETDS if it is different from the Authorization Document.

Graduate student: 

Adviser: 

February / 14 / 2011
This Student, Pham Luong Khanh, whose thesis entitled Factors Effect on the Benefits of E-learning System in Enterprises in Nam Dinh Province, Vietnam, is under my advisory and agree to submit for examination.

Adviser: [Signature]
Co-Adviser: [Signature]
Date: December / / 2010
Thesis Title: Factors Effect on the Benefits of E-learning System in Enterprises in Nam Dinh Province, Vietnam

This is to certify that the thesis submitted by the student named above in February, 2010. It is qualified and approved by the Thesis Examination Committee.

Chair, Thesis Committee: [Signature]
Committee Member: [Signature]
Committee Member: [Signature]
Adviser: [Signature]
Co-Adviser: [Signature]
Director of Department: [Signature]

December / ______/ 2010
Abstract

Today, almost companies have to face the how to develop well-trained human resources because the human resources always is the key factor of enterprise success. While traditional enterprise training model seems to be reliance on standardized testing lessens the amount of actual learning (Bondelli, 2007). So that higher education, an alternative educational method rather than a shift has become more apparent in the very recent years, such as e-learning and virtual learning as a complement to the traditional education.

In higher education, the idea to use computers in order to facilitate the process of learning has evolved with the development of first computer. Then, internet facilitated the design and development of web based learning and terms “E-learning” appeared (Erdelina Kurti, 2008). There are many researches about E-learning system, evaluating e-learning success from an information systems perspective.
Based on Information System Success Model, this study find factors which effect on the benefits of e-learning system in enterprises in Nam Dinh province. The purpose of this study is to gain a better understanding of e-learning success model and to get a better understanding of the applying of E-learning System in Vietnam. Developing and testing hypotheses by using survey data from 130 entrepreneurs of Nam Dinh province in Vietnam. This study employed SPSS 16.0 to analyze the collected data to test the relationships among factors and all items require five-point Likert-scale.

The results indicate the positive relationships among factor: Information quality, System quality, Service quality, Use, User Satisfaction and Benefits of E-Learning System.

Keywords: E-learning System, Information System Success Model
Acknowledgments

First, I would like to express my deep and sincere gratitude to my advisor, Dr. Shing H Doong, Department of Information Management, Institute of Informatics, Shu-Te University. His wide knowledge and his logical way of thinking have been great value for me. His understanding, encourage and personal guidance have provide a good basic for the present thesis.

Next, during this work I have received many helps from my friends. And many thanks to a numbers of Entrepreneurs of Vietnam new ventures who helped me to filled in the research survey that bring to me the result of this study.

Finally, I owed my loving thanks to all members of my family who help me, encourage me during my studying time. They always support me; make me feel full of energy to do best for my study.

Pham Luong Khanh, Vietnam, 2010
## Table of Contents

Abstract...........................................................................................................................................i
Acknowledgments .................................................................................................................................iii
Table of Contents.................................................................................................................................iv
List of Tables ..........................................................................................................................................vi
List of Figures .........................................................................................................................................vii
Illustration of Symbols ...........................................................................................................................viii
Chapter 1  Introduction..........................................................................................................................1
  1.1. Research Background ..................................................................................................................1
    1.1.1. Traditional Education ...........................................................................................................1
    1.1.2. E-learning system ...............................................................................................................1
  1.2. Research Motive .........................................................................................................................2
  1.3. Research purpose .......................................................................................................................3
  1.4. Research Method .......................................................................................................................3
Chapter 2  Literature Review..................................................................................................................5
  2.1. E-Learning System .....................................................................................................................5
    2.1.1. Define .................................................................................................................................5
    2.1.2. Situation of applying E-learning System in Vietnam and in Nam Dinh Province 8
  2.2. E-Learning Success Models .........................................................................................................10
    2.2.1. IS (Information System) Success Models ..........................................................................10
    2.2.2. E-Learning system assessment .......................................................................................12
Chapter 3  Research Method..................................................................................................................16
  3.1. Research Model ..........................................................................................................................16
  3.2. Research Hypotheses .................................................................................................................16
3.3. Measurement of Variables ........................................................................................................ 17
  3.3.1. Information quality .................................................................................................................. 17
  3.3.2. System Quality ....................................................................................................................... 17
  3.3.3. Use .......................................................................................................................................... 18
  3.3.4. User Satisfaction .................................................................................................................... 19
  3.3.5. Benefits of E-Learning System .............................................................................................. 19

3.4. Data Collection ............................................................................................................................ 20
  3.4.1. Data Collection method ........................................................................................................... 20
  3.4.2. Measurement Scale .................................................................................................................. 20
  3.4.3. Population .................................................................................................................................. 20
  3.4.4. Sampling method ..................................................................................................................... 21

Chapter 4 Research Result .................................................................................................................. 22
  4.1. Sample Description ....................................................................................................................... 22
  4.2. Reliability and Validity of Variables ............................................................................................ 23
  4.3. Descriptive Statistics of Variables .............................................................................................. 27
  4.4. Hypothesis Test ............................................................................................................................ 28
    4.4.1. Linear Regression Analysis for User Satisfaction ............................................................... 28
    4.4.2. Linear Regression Analysis for Use ..................................................................................... 30
    4.4.3. Linear Regression Analysis for Benefits of E-Learning System ....................................... 32
  4.5. Discussion ..................................................................................................................................... 35

Chapter 5 Research Conclusions ........................................................................................................ 37
  5.1. Findings and Contribution ............................................................................................................ 37
  5.2. Implication .................................................................................................................................... 37
  5.3. Limitation ..................................................................................................................................... 38

References ............................................................................................................................................ 39

Apendix A: Research Questionnaire .................................................................................................... 43
List of Tables

Table 1. Items of “Information Quality” Factor .......................................................... 17
Table 2. Items of “System Quality” Factor ................................................................. 18
Table 3. Items of “Use” Factor ................................................................................... 18
Table 4. Items of “User Satisfaction” Factor ............................................................... 19
Table 5. Items of “Benefits of E-Learning System” Factor ........................................ 19
Table 6. Characteristics of Sample Demographics ...................................................... 23
Table 7. Reliability Test ............................................................................................... 24
Table 8. VARIMAX Rotated Component Analysis (Factor-Loading Matrix) ............... 25
Table 9. Cumulative Percent of Variance Explanation ............................................... 26
Table 10. Descriptive Analysis for Questionnaire Items .............................................. 27
Table 11. Linear Regression Analysis for Testing H1, H2, H5b ................................... 29
Table 12. Linear Regression Analysis for Testing H3, H4, H5a .................................. 31
Table 13. Linear Regression Analysis for Testing H6, H7 ......................................... 32
Table 14. Research Hypotheses and Results .............................................................. 34
List of Figures

Figure 1. Research Procedure ................................................................................................................ 4
Figure 2. E-learning Trends ....................................................................................................................... 6
Figure 3. E-learning application in enterprises and administrative agencies ................................. 9
Figure 4. Effects of e-learning application in enterprises and administrative agencies ..... 10
Figure 5. The original D&M model Updated D&M IS success model ........................................... 11
Figure 6. The update D&M model ........................................................................................................... 11
Figure 7. e-learning applications’ Critical Success Factors (CSFs) .................................................... 12
Figure 8. E-learning Effectiveness Model ............................................................................................... 13
Figure 9. Hexagonal E-Learning Assessment Model (HELAM) ........................................................... 14
Figure 10. The e-learning success model. ............................................................................................... 15
Figure 11. The Model to Be Tested ......................................................................................................... 16
Figure 12. Path Coefficients for Research Model between Factors and “User Satisfaction” ...
.......................................................................................................................................................... 30
Figure 13. Path Coefficients for Research Model between Factors and “Use” ............................... 32
Figure 14. Path Coefficients for Research Model between factors and “Benefits of E-
Learning System ....................................................................................................................................... 33
Figure 15. Path Coefficients for Research Model ................................................................................... 34
Illustration of Symbols

IS : Information System
TV : Television
ICT : Information and communication technologies
QD-TTg : Quyết định-Thủ tướng
IT : Information technology
D&M : DeLone and McLean
Chapter 1 Introduction

1.1. Research Background

1.1.1. Traditional Education

Almost everybody is familiar with traditional education because it’s the most common education system (Bondelli, 2007). Bondelli also emphasizes that “the traditional system’s reliance on standardized testing lessens the amount of actual learning that is done in schools.” In traditional learning, Robert (1999) showed that only is in the fixed environment center, the study the environmental effect, must observe certain behavior rules, the communication condition and the limit is its shortcoming.

Furthermore, Bondelli (2007) argues: “The traditional educational system is not very effective in actually teaching students to learn. It ignores experiential learning in favor of purely intellectual, which decreases the effectiveness of the learning. It is extremely dependent on standardized testing, which is not as valuable as they claim and is actually harmful to the actual education. It is authoritarian in nature, which ignores the student’s input in deciding how and what they are to be taught”. So that higher education, an alternative educational method rather than a shift has become more apparent in the very recent years, such as e-learning and virtual learning as a complement to the traditional education.

1.1.2. E-learning system

In higher education, the idea to use computers in order to facilitate the process of learning has evolved with the development of first computer (Erdelina Kurti, 2008). Then, Erdelina Kurti showed that internet facilitated the design and development of web based learning and terms “E-learning” appeared.

Kaplan-Leiserson (2000) showed that E-learning refers to the use of electronic devices for learning, including the delivery of content via electronic media such as Internet/Intranet/Extranet, audio or video tape, satellite broadcast, interactive TV, CD-ROM, and so on.

World Wide Learn (2008) provides description of e-learning:

“E-Learning is an umbrella term that describes learning done at a computer, usually connected to a network, giving us the opportunity to learn almost anytime, anywhere. E-Learning is not unlike any other form of education - and it is widely accepted that e-Learning can be as rich and as valuable as the classroom experience or even more so. With its unique features E-Learning is an experience that leads to comprehension and mastery of new skills and knowledge, just like its traditional counterpart. Instructional Design for e-Learning has been perfected and refined over many years using established teaching principles, with many benefits to students. As a result colleges, universities, businesses, and organizations worldwide now offer their students fully accredited online degree, vocational, and continuing education programs in abundance”.

According to New Report by Global Industry Analysts (2008), E-learning has several advantages in terms of cost reduction, simplified training programs, flexibility and convenience; it is poised to become an integral component of information dissemination, and emerges as the new paradigm of modern education. The report also show that the world e-learning market is projected to exceed US$52.6 billion by 2010.

In the future, E-learning System continues to expand in scope and complexity. Because that the increasing usage of internet motivates many researchers to improve internet technologies as well as web-based applications (Raija Halonen, Tom Acton, William Golden, Kieran Conboy, 2008).

1.2. Research Motive

According to Seddon(1999), the total annual worldwide expenditure on information technology (IT) probably exceeds one trillion US dollars per year and is growing at about 10% annually.

Juhani Iivari (2005) showed that in view of the high investments in IT and its ubiquity, the success of such investments and the quality of the systems developed is of
the utmost importance both for research and in practice. It shows the importance of evaluating effectiveness of applying information systems.

In the world, the development of e-learning systems is quite a challenging issue for both schools and industry. The IS researchers face numerous difficulties in theoretical and methodological concepts (Sevgi Ozkan, Refika Koseler, Nazife Baykal, 2008). In both educational engineering and IS fields, Lee and Lee (2008) showed that increasing effectiveness of the e-learning systems has become one of the most practically and theoretically important research areas. Additionally, as the investments in e-learning systems increase so the importance of measuring IS success in e-learning applications also increases (Sevgi Ozkan, Refika Koseler, Nazife Baykal, 2008).

Currently, more and more enterprises/organizations in Nam Dinh province have applied IT, in which the application of E-learning system is in very great demand (Vũ Trọng Quế, 2010). However, there has been no article evaluating the effectiveness or success of the E-learning system application. Deriving from actual demand, it's essential to study and evaluate the effectiveness of E-learning systems as well as its application in enterprises and administrative organizations in Nam Dinh province.

1.3. Research purpose

The main purpose of this study is to research Factors Effect on the Benefits of E-learning system in Enterprises in Nam Dinh Province, Vietnam. From this, we can come to conclusion which factor affecting the success of an E-learning system in enterprises in Nam Dinh province. According to it, managers of enterprises which have applied E-learning system can control and evaluate the effectiveness of their current E-learning system. In addition, the thesis also gives an overview on E-learning system, Information System Success Models and E-learning success model.

1.4. Research Method

The research will be based on a quantitative approach, using statistic study and in-depth interviews of participants from a number of enterprises and government agencies in Nam Dinh to analyze the research hypothesis and reach conclusions. Research Procedure will include:
First, collect information related to E-Learning System, IS Success Model from research, news, articles, and business data of enterprises in Nam Dinh province and Vietnam.

Then, from the information that’s collected, research model is selected to test.
Next, make question tables to collect for research.
After that, propose people who will be delivered survey.
Next, synthesis and analyze data.
Finally, make conclusions.

Figure 1. Research Procedure
2.1. E-Learning System

2.1.1. Define

(1) Distance Learning:

Before addressing e-learning, it might be necessary to look at the way distance learning has been developed and used in the past and how it is currently delimited in the literature.

According to ARaija Halonen, Tom Acton, William Golden, Kieran Conboy (2008), distance learning is concept which has been being used to describe education not in place but far away from the education centre (academy, university, etc.). They showed that since 1960's, there was the appearance of distance learning courses via television and at the end of 1990s, when new technologies started to be applied to distance learning and thus, the concept of e–learning was born.

According to Chaney (2004), distance learning encompasses a wide spectrum of learning technologies, including the Correspondence Model (postal distribution), Video and Audio Broadcasts, Computer Based Training (CBT), CD-ROM, World Wide Web (Web), etc.

Later, Moore and Kearsley (1996) redefined distance learning as: Distance Learning is defined as planned learning that normally occurs in a different place and requires a well-defined system of delivery that includes modified teaching techniques, alternative modes for communication, including, but not limited to technology, as well as alternative administrative and organizational components.

Breitner & Hoppe (2005) summarized distance learning trends, shown in figure 2, the development of distance learning can be articulated in terms of six historical developments in three distinctive generations: Correspondence Model, Online Learning Model, E-learning Model.
(2) Modes of Delivery of ICT Supported Learning:

Today, ICT-based technologies have been undertaken to support teaching and learning in institutions, organizations and companies all over the world (Sevgi Ozkan, Refika Koseler, Nazife Baykal, 2008). In which ICT-based learning has been employed in such systems, the use of e-learning has revealed three typical ways (Robert W. Peterson, Mark A. Marostica, Lisa M. Callahan):

Blended learning: The model is a hybrid of traditional face-to-face and online learning whose environments could be rated as a “complementary mode” to the traditional (face-to-face) educational system (Collis and Moonen, 2001).

E-learning: In this mode, the process of learning and teaching are fully undertaken in virtual environments. In other words, ICT provides the means of running and delivering a learning program totally distinct from face-to-face teaching as a replacement of face-to-face teaching (Dron, 2007). Defines of E-learning are presented more detail at the next.
Mobile learning: Learning and enhancing teaching refers to a wide range of wireless and mobile technologies (e.g. PDAs, tablet computers, mobile phones, etc.) (McAndrew, 2009).

(3) E-Learning:

Different authors have given definitions about e-learning:

“E-learning system is defined as the entire technological, organizational and management system that facilitated and enables students learning via the internet” (Levy & Murphy, 2002).

“Learning that uses computer networks or webs as the delivery or mediation mechanism”. (Piskurich, 2003).

“E-learning utilizes computers and computer networks as an additional and complementary channel of communication; connecting learners with learning media, with other people (fellow learners, sources, facilitators), with data (about learning, about media, about people) and with processing power”. (While Shepherd, 2003).

“E-Learning is an umbrella term that describes learning done at a computer, usually connected to a network, giving us the opportunity to learn almost anytime, anywhere. E-Learning is not unlike any other form of education - and it is widely accepted that e-Learning can be as rich and as valuable as the classroom experience or even more so. With its unique features E-Learning is an experience that leads to comprehension and mastery of new skills and knowledge, just like its traditional counterpart. Instructional Design for e-Learning has been perfected and refined over many years using established teaching principles, with many benefits to students. As a result colleges, universities, businesses, and organizations worldwide now offer their students fully accredited online degree, vocational, and continuing education programs in abundance” (World Wide Learn, 2008).

(4) Terminology:

Moore., M. G., & Kearsley, G. (1996) show that there were many terminologies which have been used as synonyms to e-learning, for example:
Abbreviations like CBT (Computer-Based Training), IBT (Internet-Based Training) or WBT (Web-Based Training), LMS (Learning Management System).

2.1.2. Situation of applying E-learning System in Vietnam and in Nam Dinh Province

(1) In Vietnam:

According to Vietnam E-learning system report 2009, the Prime Minister also issued Decision No. 246/2005/QD-TTg promulgating the Strategy for Vietnam Information and Communications Technology towards 2010 and direction towards 2020, in which one of the specific goals is providing effective distance learning services. The Decision emphasizes the development and improvement of the distance learning quality to enable people to continually study and improve their knowledge and professional skills and to develop the human resource for the industrialization and modernization.

In this report, result of a survey on e-learning at 200 organizations, including state administrative agencies, and enterprises is presented below (Vietnam Trading department, 2009):

<1> Survey of E-learning application in enterprises and administrative agencies.

Many enterprises are now fully aware of the great benefits of e-learning and looking to apply it.
Figure 3. E-learning application in enterprises and administrative agencies

Source: Viet Nam E-learning system Report 2009

<2> Survey of Effects of e-learning application in enterprises and administrative agencies

According to the survey results, 89% of enterprises responded that their training costs were decreased, 80% found a professional skill improvement of staff taking online courses. Thus, 90% of the enterprises using e-learning told that they will increase spending for it while 10% will maintain the current budget and none is going to cut the current level of investment.
### Table 1: Effects of e-learning application in enterprises and administrative agencies

<table>
<thead>
<tr>
<th>No.</th>
<th>Effects</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Saving training cost</td>
<td>35</td>
<td>89%</td>
</tr>
<tr>
<td>2</td>
<td>Improvement in staff’s skills</td>
<td>32</td>
<td>80%</td>
</tr>
</tbody>
</table>

![Image](image.png)

**Figure 4. Effects of e-learning application in enterprises and administrative agencies**

*Source: Viet Nam E-learning system Report 2009*

However, the survey results also showed that in training activities of businesses e-learning system has proven its deciding role. In the coming time, it has the potential for further development in companies, especially small and medium ones in different business areas.

(2) In Nam Dinh province:

According to Vũ Trọng Quế (2010), enterprises in Nam Dinh province are more and more developing and growing. According to statistics in 2005, there were 133 new-established businesses in this province. However, he showed that the application of IT in general and the E-learning System in particular in the enterprises in Nam Dinh is still very limited and in great demand.

### 2.2. E-Learning Success Models

#### 2.2.1. IS (Information System) Success Models

Because E-learning system is a special type of IS so it’s necessary to present a review of the IS success and IS measurement literature. Heo & Han (2003) showed that in IS success models, the DeLone and McLean IS Success Models are praised at most. Due to consider the e-learning environment systemically and holistically, the next will present the D&M in light of its potential.

DeLone and McLean (1992) introduced a comprehensive review of IS success literature and proposed a model of IS success (shown in Figure 5). Their model includes six interrelated dimensions of IS success: system quality, the output information quality, consumption (use) of the output, the user’s response...
(user satisfaction), the effect of the IS on the behavior of the user (individual impact), and the effect of the IS on organizational performance (organizational impact).

DeLone and McLean (2003) showed an update to their IS success model (see Fig. 6) whose quality, and service quality are main changes. In fact, DeLone and McLean said: “As discussed earlier, quality has three major dimensions: information quality, systems quality and service quality”. However, they removed ‘Individual Impact’ and ‘Organisational Impact’ and replaced them with ‘Net Benefits’; further, they added feedback loops to ‘Intention to Use’ and ‘User Satisfaction’. They also added ‘Intention to Use’ to the model.

Figure 5. The original D&M model Updated D&M IS success model
Because the D&M IS success model is a framework and model for measuring the complex dependent variable in IS research so it has been widely used to evaluate success (Raija Halonen, Tom Acton, William Golden, Kieran Conboy, 2008). According to them, From background of D&M IS success model and from different points of view, other model is proposed to meet the requirements set by several kinds of information systems. For example, DeLone and McLean (2004) evaluated the success of E-learning system systems.

2.2.2. E-Learning system assessment

In the world, there are many prior studies of e-Learning assessment, it includes main studies:

(1) E-Learning Critical Success Factors (Hassan M. Selim, 2007)

Hassan M. Selim (2007) proposed e-learning applications’ Critical Success Factors (CSFs) from student perceptions, shown in Figure 7. The CSFs includes: instructor characteristics, student characteristics, technology infrastructure and university support.

![Diagram of Critical Success Factors]

Figure 7. E-learning applications’ Critical Success Factors (CSFs)

Source: Sevgi Ozkan, Refika Koseler, Nazife Baykal (2008)

(2) Factors Contributing to the Creation of Successful E-Learning Environments (Eduardo Salas, Richard D. Johnson, Steven Hornik and 2008)

Salas, Johnson and Hornik (2008) developed a model of e-learning effectiveness which adds social presence because they explained that most of e-learning assessment models do not take into account the importance of social presence. Their model shown in Figure 8.
According to Liaw, Huang and Chen (2007), e-Learning assessment needs to explore instructors’ and learners’ attitudes toward e-learning usage because there is minimal research on instructors’ and learners’ attitudes toward in e-learning environments. Their research helps instructors have very positive perceptions toward using e-learning as a teaching assisted tool. However, behavioral intention to use e-learning is influenced by self efficacy.

(4) Hexagonal E-Learning Assessment Model (Sevgi Ozkan, Refika Koseler, Nazife Baykal, 2008)

Sevgi Ozkan, Refika Koseler, Nazife Baykal (2008) proposed Hexagonal E-Learning Assessment Model (HELAM) which is a conceptual e-learning success evaluation model for assessing learner satisfaction with both internet-based learning management systems and blended learning. Their model includes 6 dimensions of e-learning: Technical Issues: System Quality, Service Quality,
Content Quality; Social Issues: Learner Perspective, Instructor Attitudes and Supporting Issues, shown in Figure 9.

Figure 9. Hexagonal E-Learning Assessment Model (HE Lam)
Source: Sevgi Ozkan, Refika Koseler, Nazife Baykal (2008)

(5) E-Learning Success Models of Clyde W. Holsapple and Anita Lee-Post

In 2006, Holsapple and Lee-Post proposed the e-learning success model which adapted from DeLone and McLean’s updated information systems success model, shown in Figure 10. Their model is divided in three phases: ‘System design’, ‘System delivery’ and ‘System outcome’. In the figure, we see the arrows describe the dependence between the phases in the assessment: ‘System design’ is essential when considering the success of delivery and the influences of the outcome that the delivery brings. Likewise, ‘Use’ and ‘User Satisfaction’ are dependent upon each other (Holsapple and Lee-Post, 2006).
Figure 10. The e-learning success model.

Source: (Holsapple & Lee-Post, 2006)
Chapter 3 Research Method

3.1. Research Model

A research model, based on the above literature review, is developed to check the relationship between factors effect on the benefits of E-learning system. In my thesis, I based update D&M IS Success model by considering it in the context of E-learning systems which match with characteristics of Vietnam and E-learning system is a special type of IS. It is shown in Figure 11. If measuring the success of a specific information system department, Service Quality maybe the most important variable. However, in order to measure the success of a single system, opposite to the IS department, Information Quality and System Quality maybe considered the two most important quality dimensions (DeLone and McLean, 2003). Thus, i don’t consider Service Quality as E-learning system systems are individual systems (Wen, L. S., 2005).

Figure 11. The Model to Be Tested

3.2. Research Hypotheses

H1: Information Quality has positive effect on Use.
H2: System Quality has positive effect on Use.
H3: Information Quality has positive effect on User Satisfaction
H4: System Quality has positive effect on User Satisfaction.
H5a: User Satisfaction has positive effect on Use.
H5b: Use has positive effect on User Satisfaction.
H6: The Use has positive effect on Net Benefits of E-Learning System.
H7: User Satisfaction has positive effect on Net Benefits of E-Learning System.

3.3. Measurement of Variables

3.3.1. Information quality

Since 1985, Srinivasan developed and validated items of “Information quality” factor. This thesis summarizes the items of measurement as those shown in the Table 1. All of the item measure will be using 5-point scale: Strongly disagree, disagree, undecided, agree, and strongly agree.

Table 1. Items of “Information Quality” Factor

<table>
<thead>
<tr>
<th>Factor</th>
<th>Itema</th>
<th>Content of Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information Quality</td>
<td>IQ1</td>
<td>Does your E-learning system provide output that is exactly as what you need?</td>
</tr>
<tr>
<td></td>
<td>IQ2</td>
<td>Does your E-learning system provide information ease to understand?</td>
</tr>
<tr>
<td></td>
<td>IQ3</td>
<td>Does your E-learning system provide complete information you need?</td>
</tr>
</tbody>
</table>

“Itema represents information quality”

Source: DeLone, W.H., and McLean (1992)

3.3.2. System Quality

Since 1985, Srinivasan developed and validated items of “System quality” factor. This thesis summarizes the items of measurement as those shown in the Table 2. All of the item measure will be using 5-point scale: Strongly disagree, disagree, undecided, agree, and strongly agree.
Table 2. Items of “System Quality” Factor

<table>
<thead>
<tr>
<th>Factor</th>
<th>Item</th>
<th>Content of Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Quality</td>
<td>SyQ1</td>
<td>Does E-learning system provide up-to-date information?</td>
</tr>
<tr>
<td></td>
<td>SyQ2</td>
<td>Do you get the information you need in time?</td>
</tr>
<tr>
<td></td>
<td>SyQ3</td>
<td>Is the time to response of your E-learning system is very quickly?</td>
</tr>
<tr>
<td></td>
<td>SyQ4</td>
<td>Is information which E-learning system provided accurate?</td>
</tr>
</tbody>
</table>

“Item$^a$ represents System quality”

Source: DeLone, W.H., and McLean (1992)

3.3.3. Use

Since 1985, Srinivasan developed and validated items of “Use” factor. This thesis summarizes the items of measurement as those shown in the Table 4. All of the item measure will be using 5-point scale: Strongly disagree, disagree, undecided, agree, and strongly agree.

Table 3. Items of “Use” Factor

<table>
<thead>
<tr>
<th>Factor</th>
<th>Item</th>
<th>Content of Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Quality</td>
<td>U1</td>
<td>I intend to use E-learning system rather than discontinue its use</td>
</tr>
<tr>
<td></td>
<td>U2</td>
<td>My intention are to continue using E-learning system than use traditional learning</td>
</tr>
<tr>
<td></td>
<td>U3</td>
<td>The average connect time per access is long</td>
</tr>
<tr>
<td></td>
<td>U4</td>
<td>If I could, I would like to continue my use E-learning system</td>
</tr>
</tbody>
</table>

“Item$^a$ represents Use”

Source: DeLone, W.H., and McLean (1992)
3.3.4. User Satisfaction

Since 1983, Bailey and Pearson developed and validated items of “User Satisfaction” factor. This thesis summarizes the items of measurement as those shown in the Table 5. All of the item measure will be using 5-point scale: Strongly disagree, disagree, undecided, agree, and strongly agree.

Table 4. Items of “User Satisfaction” Factor

<table>
<thead>
<tr>
<th>Factor</th>
<th>Item(^a)</th>
<th>Content of Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Satisfaction</td>
<td>US1</td>
<td>The degree of congruence between what the user wants or requires and what the information products and services provided is high</td>
</tr>
<tr>
<td></td>
<td>US2</td>
<td>The software provides complete features.</td>
</tr>
<tr>
<td></td>
<td>US3</td>
<td>The description of the functions/commands displayed on screen is clear.</td>
</tr>
<tr>
<td></td>
<td>US4</td>
<td>I am satisfied with using E-learning</td>
</tr>
<tr>
<td></td>
<td>US5</td>
<td>Using the system was enjoyable</td>
</tr>
</tbody>
</table>

“Item\(^a\) represents User Satisfaction”

Source: DeLone, W.H., and McLean (1992)

3.3.5. Benefits of E-Learning System

Holsapple and Lee-Post (2006) developed and validated items of “Benefits of E-Learning System”. This thesis summarizes the items of measurement as those shown in the Table 7. All of the item measure will be using 5-point scale: Strongly disagree, disagree, undecided, agree, and strongly agree.

Table 5. Items of “Benefits of E-Learning System” Factor

<table>
<thead>
<tr>
<th>Factor</th>
<th>Item(^a)</th>
<th>Content of Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefits of E-Learning</td>
<td>NB1</td>
<td>E-Learning System helps me enhanced learning</td>
</tr>
<tr>
<td>System</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>NB2</td>
<td>You use E-Learning System to help me empowered</td>
</tr>
<tr>
<td></td>
<td>NB3</td>
<td>You use E-Learning System to help me time</td>
</tr>
</tbody>
</table>
3.4. Data Collection

3.4.1. Data Collection method

Survey is the one of the most common method of data collecting. It can be classified into two broad categories: the questionnaire and the interview (American Statistical Association, 1997). William M.K. Trochim (2008) showed that there are many advantages to mail surveys:

- Cost Effectiveness
- Geographical Stratification
- Honesty

The bottom line is, I suggest to use mail survey method in my thesis. In part one of the mail-survey, participants were required to fill-in personal information to understand their gender, age, job, recent position, experience in IT, experience in human resource management, experience in E-Learning System.

After finishing part 1, participants were required to fill-out the remaining questions in part 2 which contain items the same as content of the table at 3.3.

3.4.2. Measurement Scale

In my thesis, the whole adopted items were modified for the context if necessary, paraphrased to suit a five-point, for example of Likert-type scale includes: 1=Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree, and 5=Strongly Agree (Abdinnour-Helm, S., Lengnick-Hall, M., & Lengnick-Hall, C., 2003).

3.4.3. Population

About population, I suggest to send email to officers at IT departments and human resource management departments in enterprises or government agencies in Namdhinh which has implemented and applied the E-learning system. I proposed to select and contact 50 enterprises and government agencies in the province.
3.4.4. Sampling method

There are several options to select the enterprises: Random selection from the province businesses directory or random selection from list of E-Learning system-implemented enterprises or organizations. Select the respondents based on subjectively judging an organization’s potential and capability to adopt E-Learning system. Random selection is normally considered the best method to ensure objectivity and data quality. However in the case of Nam Dinh where the number of organizations which have implemented E-Learning system is extremely limited, random selection will select mostly enterprises which will not be prepared for E-Learning system for a long time to come, and as a result will not bring meaningful data.

In Nam Dinh case, I decided the best selection is to consult with relevant staff at the Department of Science and Technology to hand-pick enterprises which are judged by the department to be potential E-Learning system target, or having a condition of near-ready.
Chapter 4 Research Result

A total 150 samples of questionnaire were sent to staffs who have implemented and applied the E-learning System in enterprises, government agencies in Namdinh province. After a month, there were 145 feedbacks with 15 samples in poor quality responses; finally we were left 130 effective samples.

I use software SPSS 13.0 package to analyze and test the hypotheses of this study. The statistical analysis methods and results adopted are as follows:

4.1. Sample Description

The detail description of samples or the respondents’ personal data, such as their gender, age, Experience in IT, field of study, ..and so on will be analyzed. Every construct of the data will be analyzed in percentage, frequency distribution in order to know the sample distribution.

The demographics of officers who are at IT departments and human resource management departments of enterprises or government agencies in Namdinh province include five major demographics: (1) Gender, (2) Age, (3) Experience in IT, (4) Experience in human resource management and (5) Experience in E-Learning System.

As shown in Table 8, our samples include 46.15% Male and 53.85 Female. There is a marked difference in the percentage between male and female, this also shows that you should be a female to run this kind of business.

In 130 respondents, the percentage of the respondents for age between less than 30, 30-39, 40-50, and over 50 are 53.85%, 30.76%, 13.07%, and 2.32%, respectively, the most of the respondents in this study are under 40 years old (more than 80%).

We also have the percentages of Experience in IT: 15.4% (Under 1 year), 61.53% (1-3 year) and 23.07% (More than 3 year). The most of the respondents are medium experience in IT.

Also from the descriptive statistics of these samples, we can see that the most of our respondents have experience in human resource management (more than 50%) and have medium experience in E-Learning System (more than 80%).
Table 6. Characteristics of Sample Demographics

<table>
<thead>
<tr>
<th>Measure</th>
<th>Item</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>60</td>
<td>46.15</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>70</td>
<td>53.85</td>
</tr>
<tr>
<td>Age</td>
<td>&lt; 30</td>
<td>70</td>
<td>53.85</td>
</tr>
<tr>
<td></td>
<td>30 - 39</td>
<td>40</td>
<td>30.76</td>
</tr>
<tr>
<td></td>
<td>40 - 50</td>
<td>17</td>
<td>13.07</td>
</tr>
<tr>
<td></td>
<td>Over 50</td>
<td>3</td>
<td>2.32</td>
</tr>
<tr>
<td>Experience in IT</td>
<td>Under 1 year</td>
<td>20</td>
<td>15.4</td>
</tr>
<tr>
<td></td>
<td>1-3 year</td>
<td>80</td>
<td>61.53</td>
</tr>
<tr>
<td></td>
<td>More than 3 year</td>
<td>30</td>
<td>23.07</td>
</tr>
<tr>
<td>Experience in human resource management</td>
<td>Under 1 year</td>
<td>15</td>
<td>11.57</td>
</tr>
<tr>
<td></td>
<td>1-3 year</td>
<td>45</td>
<td>34.58</td>
</tr>
<tr>
<td></td>
<td>More than 3 year</td>
<td>70</td>
<td>53.85</td>
</tr>
<tr>
<td>Experience in E-Learning System</td>
<td>Under 1 year</td>
<td>35</td>
<td>26.90</td>
</tr>
<tr>
<td></td>
<td>1-3 year</td>
<td>80</td>
<td>61.53</td>
</tr>
<tr>
<td></td>
<td>More than 3 year</td>
<td>15</td>
<td>11.57</td>
</tr>
</tbody>
</table>

4.2. Reliability and Validity of Variables

To examine the reliability and validity of variables, I suggested to use factor analysis and Cronbach’s Alpha.

Factor analysis is a technique used to identify factors that statistically explain the variation and co-variation among measures. Factor loading of an item must be greater than 0.5. About extracting to number of factor, based on knowledge of the content theory about research model, we may be see six factors in research model will be present in the data file [36]. However, the SPSS software support two options: Eigen value over 1 or number of factors then I chosen method of number of factors (5 factor of research model).
Reliability applies to a measure when similar results are obtained over time and across situation. Broadly defined, reliability is the degree to which measures are free from error and therefore yield consistent results. Usually reliability is measured by Cronbach’s α; if it is greater than 0.7, then it means that there exists high degree of reliability, if less than 0.35, then it means that the reliability is relatively low, and this coefficient needs to be deleted.

Firstly, I measure the reliability of the measurement for the five factors, including Information quality, System quality, Service quality, Intention to use and User Satisfaction. Factors with Cronbach’s α below 0.5 will be deleted. Cronbach’s α is to test whether the measures are free from error. Throughout the test we find out that all of the Cronbach’s α are greater than 0.982, meaning that the factors have high reliability. The result is shown in the Table 7.

Table 7. Reliability Test

<table>
<thead>
<tr>
<th>Factors</th>
<th>Items</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information quality</td>
<td>3</td>
<td>0.987</td>
</tr>
<tr>
<td>System quality</td>
<td>4</td>
<td>0.984</td>
</tr>
<tr>
<td>Use</td>
<td>4</td>
<td>0.982</td>
</tr>
<tr>
<td>User Satisfaction</td>
<td>5</td>
<td>0.993</td>
</tr>
<tr>
<td>Benefits of E-Learning System</td>
<td>3</td>
<td>0.985</td>
</tr>
</tbody>
</table>

Secondly, factor analysis can be used to identify the structure of relationships among respondents (or items) by examining the correlations between the respondents (or items). With the factor analysis, we can identify the separate dimensions of the structure and then determine the extent to which each variable is explained by each dimension. Once these dimensions and the explanation of each variable are determined, we can do summarization and data reduction. In order to assess construct validity and identify the unique dimensions of each construct, factor analysis with VARIMAX rotation was employed. Construct validity examines the extent to which a construct measures the variable of interest. In other words, it should demonstrate relatively high
correlations between items of the same construct (convergent validity) and low correlations between items of constructs that are expected to differ (discriminant validity). Table 8 shows the results of the VARIMAX rotation on the original 19 items constrained to 5 factors.

Table 8. VARIMAX Rotated Component Analysis (Factor-Loading Matrix)

<table>
<thead>
<tr>
<th>Information Quality</th>
<th>System quality</th>
<th>Service quality</th>
<th>Use</th>
<th>User Satisfaction</th>
<th>Benefits of E-Learning System</th>
</tr>
</thead>
<tbody>
<tr>
<td>IQ1</td>
<td>.827</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IQ2</td>
<td>.838</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IQ3</td>
<td>.836</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SyQ1</td>
<td>.869</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SyQ2</td>
<td>.868</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SyQ3</td>
<td>.844</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SyQ4</td>
<td>.867</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U1</td>
<td>.743</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U2</td>
<td>.761</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U3</td>
<td>.788</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U4</td>
<td>.783</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>US1</td>
<td></td>
<td></td>
<td></td>
<td>.806</td>
<td></td>
</tr>
<tr>
<td>US2</td>
<td></td>
<td></td>
<td></td>
<td>.805</td>
<td></td>
</tr>
<tr>
<td>US3</td>
<td></td>
<td></td>
<td></td>
<td>.806</td>
<td></td>
</tr>
</tbody>
</table>
From result of the table 8, three no items were eliminated because all items’ factor loading greater than 0.5. Then, eigen value as well as cumulative percent of variance explanation are shown in the Table 9:

Table 9. Cumulative Percent of Variance Explanation

<table>
<thead>
<tr>
<th>Factor</th>
<th>Eigen value</th>
<th>Percent of Variance (%)</th>
<th>Cumulative Percent of Variance (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefits of E-Learning System</td>
<td>13.518</td>
<td>71.149</td>
<td>71.149</td>
</tr>
<tr>
<td>User Satisfaction</td>
<td>1.831</td>
<td>9.637</td>
<td>80.787</td>
</tr>
<tr>
<td>Use</td>
<td>1.256</td>
<td>6.609</td>
<td>87.396</td>
</tr>
<tr>
<td>System quality</td>
<td>.932</td>
<td>4.908</td>
<td>92.303</td>
</tr>
<tr>
<td>Information quality</td>
<td>.811</td>
<td>4.270</td>
<td>96.573</td>
</tr>
</tbody>
</table>

From the Table 9, we can see:

For Benefits of E-Learning System factor, cumulative percentages of variance explained by the factors were greater than 71% for 3 items are analyzed.
For User Satisfaction factor, cumulative percentages of variance explained by the factors were greater than 80% for 5 items are analyzed.

For Use factor, cumulative percentages of variance explained by the factors were greater than 87% for 4 items are analyzed.

For System quality factor, cumulative percentages of variance explained by the factors were greater than 92% for 4 items are analyzed.

For Information quality factor, cumulative percentages of variance explained by the factors were greater than 96% for 3 items are analyzed.

4.3. Descriptive Statistics of Variables

Use mean and standard deviation to describe my research variables: Information quality, System quality, Service quality, Use, User Satisfaction and Benefits of E-Learning System, shown in table 11.

Table 10. Descriptive Analysis for Questionnaire Items

<table>
<thead>
<tr>
<th>Factors</th>
<th>Items</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>Std.Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>IQ1</td>
<td>130</td>
<td>1.00</td>
<td>5.00</td>
<td>2.7000</td>
<td>1.24296</td>
</tr>
<tr>
<td>IQ2</td>
<td>130</td>
<td>1.00</td>
<td>5.00</td>
<td>2.6077</td>
<td>1.30293</td>
</tr>
<tr>
<td>IQ3</td>
<td>130</td>
<td>1.00</td>
<td>5.00</td>
<td>2.6385</td>
<td>1.28801</td>
</tr>
<tr>
<td>SQ1</td>
<td>130</td>
<td>1.00</td>
<td>5.00</td>
<td>3.0385</td>
<td>.92681</td>
</tr>
<tr>
<td>SQ2</td>
<td>130</td>
<td>1.00</td>
<td>5.00</td>
<td>3.0846</td>
<td>.96476</td>
</tr>
<tr>
<td>SQ3</td>
<td>130</td>
<td>1.00</td>
<td>5.00</td>
<td>3.0692</td>
<td>.94981</td>
</tr>
<tr>
<td>SQ4</td>
<td>130</td>
<td>1.00</td>
<td>5.00</td>
<td>3.1000</td>
<td>.97129</td>
</tr>
<tr>
<td>IE1</td>
<td>130</td>
<td>1.00</td>
<td>5.00</td>
<td>3.0769</td>
<td>.96139</td>
</tr>
<tr>
<td>IE2</td>
<td>130</td>
<td>1.00</td>
<td>5.00</td>
<td>2.8231</td>
<td>1.09591</td>
</tr>
</tbody>
</table>
4.4. Hypothesis Test

I use regression analysis methods to test hypotheses at 3.2. The purpose of regression analysis is to create a linear equation, in order to analyze the relationship between dependent variables and independent variable then to test the hypotheses in this study.

Firstly, linear regression analysis for User Satisfaction (H1, H2, H3, H5b) is one of the research purposes. Next, linear regression analysis for Use is also tested in this study. Finally, we also test linear regression analysis for on Benefits of E-Learning System (H6, H7)

4.4.1. Linear Regression Analysis for User Satisfaction

The results of linear regression analysis for factors (Information quality, System quality, Use) influencing User Satisfaction are shown in the Table 1. That model includes two hypotheses (H1, H2, H3, H5a):

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>IE3</td>
<td>130</td>
<td>1.00</td>
<td>5.00</td>
<td>2.7923</td>
</tr>
<tr>
<td>IE4</td>
<td>130</td>
<td>1.00</td>
<td>5.00</td>
<td>2.7923</td>
</tr>
<tr>
<td>US1</td>
<td>130</td>
<td>1.00</td>
<td>5.00</td>
<td>2.8000</td>
</tr>
<tr>
<td>US2</td>
<td>130</td>
<td>1.00</td>
<td>5.00</td>
<td>2.7308</td>
</tr>
<tr>
<td>US3</td>
<td>130</td>
<td>1.00</td>
<td>5.00</td>
<td>2.7077</td>
</tr>
<tr>
<td>US4</td>
<td>130</td>
<td>1.00</td>
<td>5.00</td>
<td>2.7308</td>
</tr>
<tr>
<td>US5</td>
<td>130</td>
<td>1.00</td>
<td>5.00</td>
<td>2.7154</td>
</tr>
<tr>
<td>NB1</td>
<td>130</td>
<td>1.00</td>
<td>5.00</td>
<td>2.9308</td>
</tr>
<tr>
<td>NB2</td>
<td>130</td>
<td>1.00</td>
<td>5.00</td>
<td>2.9077</td>
</tr>
<tr>
<td>NB3</td>
<td>130</td>
<td>1.00</td>
<td>5.00</td>
<td>2.9154</td>
</tr>
</tbody>
</table>
H1: Information Quality has positive effect on Use.
H2 System Quality has positive effect on Use.
H5a: User Satisfaction has positive effect on Use.

Table 11. Linear Regression Analysis for Testing H1, H2, H5b

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Standardized Coefficients β</th>
<th>t-value</th>
<th>Sig.</th>
<th>R2</th>
<th>Adj-R2</th>
<th>F value</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information quality</td>
<td>.280**</td>
<td>3.345</td>
<td>.001</td>
<td>.602</td>
<td>.593</td>
<td>63.634</td>
<td>.000</td>
</tr>
<tr>
<td>System quality</td>
<td>.173*</td>
<td>2.098</td>
<td>.038</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use</td>
<td>.407***</td>
<td>4.374</td>
<td>.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Dependent variable: User Satisfaction

***p<0.001, **p<0.01, *p<0.05, +p < 0.1

The final model shown in the Table 16 had a very good overall fit (F = 63.634, p = 0.000). And at significant level 0.05, all factors have significant positive relationships with User Satisfaction. Therefore, we conclude that hypotheses H1, H2, H5b are supported hypothesis. We also can see in the table that the adjusted R2 value for three factors influencing User Satisfaction is 0.593, meaning that the explanation ability of the independent constructs is good for our dependent variable, User Satisfaction. Among factors (including Information quality, System quality, Use), the most important one to explain the influence on User Satisfaction is Use (β = 0.407; next will is Information quality (β = 0.280);) and the last one is System quality (β = 0.173).

And the regression model is illustrated as follow:

\[ US = 0.280IQ + 0.173SyQ + 0.4079U + e \]

Where: US represents for User Satisfaction
       IQ represents for Information quality

29
SyQ represents for System quality
U represents for Use

The results also can be seen in the Figure 12 below. It illustrates the estimated coefficients and their significance in the structural model between Factors and “User Satisfaction”

![Diagram showing the relationship between Information quality, System quality, User Satisfaction, and Use]

Figure 12. Path Coefficients for Research Model between Factors and “User Satisfaction”
(Path Significance ***p<0.001, **p<0.01, *p<0.05)

4.4.2. Linear Regression Analysis for Use

The results of linear regression analysis for factors (Information quality, System quality, Service quality, User Satisfaction) influencing Use are shown in the Table 12. That model includes two hypotheses (H3, H4, H5a):

H3: Information Quality has positive effect on User Satisfaction
H4: System Quality has positive effect on User Satisfaction.
H5a: Use has positive effect on User Satisfaction.
Table 12. Linear Regression Analysis for Testing H3, H4, H5a

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Standardized Coefficients β</th>
<th>t-value</th>
<th>Sig.</th>
<th>R2</th>
<th>Adj-R2</th>
<th>F value</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information quality</td>
<td>.305***</td>
<td>4.169</td>
<td>.000</td>
<td>.684</td>
<td>.677</td>
<td>90.952</td>
<td>.000</td>
</tr>
<tr>
<td>System quality</td>
<td>.315***</td>
<td>4.541</td>
<td>.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>User Satisfaction</td>
<td>.324***</td>
<td>4.374</td>
<td>.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Dependent variable: Use

***p<0.001, **p<0.01, *p<0.05, +p < 0.1

The final model shown in the Table 16 had a very good overall fit (F = 90.952, p = 0.000). And at significant level 0.05, all factors have significant positive relationships with Use. Therefore, we conclude that hypotheses H3, H4, H5a are supported hypothesis. We also can see in the table that the adjusted R2 value for three factors influencing Use is 0.677, meaning that the explanation ability of the independent constructs is good for our dependent variable, Use. Among factors (including Information quality, System quality, User Satisfaction), the most important one to explain the influence on Use is System quality (β = 0.324); the second will be Service quality (β = 0.315); and the last one is Information quality (β = 0.305).

And the regression model is illustrated as follow:

\[ U = 0.315 \text{SyQ} + 0.305 \text{IQ} + 0.324U + e \]

Where: US represents for User Satisfaction

IQ represents for Information quality

SyQ represents for System quality

U represents for Use
The results also can be seen in the Figure 13 below. It illustrates the estimated coefficients and their significance in the structural model between Factors and “Use”

![Diagram of the structural model between Factors and “Use”](image)

Figure 13. Path Coefficients for Research Model between Factors and “Use”
(Path Significance ***p<0.001, *p<0.05)

4.4.3. Linear Regression Analysis for Benefits of E-Learning System

The results of linear regression analysis for factors (User Satisfaction, Use) influencing Benefits of E-Learning System are shown in the Table 13. That model includes two hypotheses (H6, H7):

H6: The Use has positive effect on Benefits of E-Learning System.
H7: User Satisfaction has positive effect on Benefits of E-Learning System.

Table 13. Linear Regression Analysis for Testing H6, H7

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Standardized Coefficients β</th>
<th>t-value</th>
<th>Sig.</th>
<th>R2</th>
<th>Adj-R2</th>
<th>F value</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Satisfaction</td>
<td>.595***</td>
<td>6.844</td>
<td>.000</td>
<td>.559</td>
<td>.552</td>
<td>80.349</td>
<td>0.000</td>
</tr>
<tr>
<td>Use</td>
<td>.192*</td>
<td>2.214</td>
<td>.029</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Dependent variable: Benefits of E-Learning System

***p<0.001, **p<0.01, *p<0.05, +p < 0.1
The final model shown in the Table 12 had a good fit (F = 80.349, p = 0.000). And at significant level 0.05, two factors (User Satisfaction, Use) has significant positive relationships with Benefits of E-Learning System. We also can see in the table that the adjusted R2 value for the influences of Benefits of E-Learning System is 0.552 meaning that the explanation ability is good for our dependent variable, Benefits of E-Learning System. Among two factors (including User Satisfaction, Use), the most important one to explain the influence on Benefits of E-Learning System is User Satisfaction (β = 0.595) and the last one is Use (β = 0.192).

And the regression model is illustrated as follow:

\[ NB = 0.595US + 0.192U + e \]

Where: NB represents for Benefits of E-Learning System
US represents for User Satisfaction
U represents for Use

The results also can be seen in the Figure 14 below. It illustrates the estimated coefficients and their significance in the structural model between factors and “Benefits of E-Learning System”

![Path Coefficients for Research Model between factors and “Benefits of E-Learning System (Path Significance ***p<0.001, *p<0.05)"

Finally, the results of Linear Regression Analysis can be seen in the Figure 15. It illustrates the estimated coefficients and their significance in the structural model for hypothesis: H1, H2, H3, H4, H5b, H5a, H6 and H7.
Figure 15. Path Coefficients for Research Model  (Path Significance ***p<0.001, *p<0.05)

About results of hypothesis, as well as the conclusion of hypotheses supporting are shown in the table 14.

Table 14. Research Hypotheses and Results

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1: Information Quality has positive effect on Use.</td>
<td>Supported</td>
</tr>
<tr>
<td>H2: System Quality has positive effect on Use.</td>
<td>Supported</td>
</tr>
<tr>
<td>H3: Information Quality has positive effect on User Satisfaction</td>
<td>Supported</td>
</tr>
<tr>
<td>H4: System Quality has positive effect on User Satisfaction.</td>
<td>Supported</td>
</tr>
<tr>
<td>H5a: User Satisfaction has positive effect on Use.</td>
<td>Supported</td>
</tr>
<tr>
<td>H5b: Use has positive effect on User Satisfaction.</td>
<td>Supported</td>
</tr>
<tr>
<td>H6: The Use has positive effect on Net Benefits of E-Learning System.</td>
<td>Supported</td>
</tr>
<tr>
<td>H7: User Satisfaction has positive effect on Net Benefits of E-Learning System</td>
<td>Supported</td>
</tr>
</tbody>
</table>
4.5. Discussion

The results of the study indicate that all factors of E-Learning Success Models of Clyde W. Holsapple and Anita Lee-Post has positive effect each other:

- In the both factors which has positive effect on Net Benefits of E-Learning System, including: Use and User Satisfaction, there is a factor have the most significant important: it’s User Satisfaction. This indicates that whether the E-learning system is used effectively or not depends primarily on the evaluation of end user’s satisfaction. The major reason explaining why E-learning system is implemented in enterprises, is to help enterprises’ employees to improve the efficiency in learning and applying this system into their work. If users feel that the study on E-learning is not effective and doesn’t assist them much, it means that the implementation of E-learning doesn’t bring about benefit. The factor “Use” in expanding varied of learning contents has also effect on the effectiveness of E-Learning system. However, obviously, this factor depends mainly on opinions of many different users: Some people like multimedia lectures, other people like power point lectures, etc. As a result, the results of analysis indicates that this factor affects only to a certain degree the efficiency of E-Learning.

- In the three factors which has positive effect on factor of “Use”, including: Information quality, System quality, Use Satisfaction, there is a factor have the most significant important: it’s Use Satisfaction. The facilities of E-learning system, which expand large variety of contents of lecture, have to depend on the quality of the system. A system of high quality will offer many integrated features which extend the content of lecture, thereby, support the users.

- In the three factors which has positive effect on factor of “Use Satisfaction”, including: Information quality, System quality, Use there is a factor have the most significant important: it’s Use. This indicates that, in Nam Dinh province or in other provinces, where IT infrastructure is still limited, the user satisfaction depends on the service quality of service provider and of system implementation. With respect to users who have a little knowledge and experience on IT, the attitude and responsible of staffs
who implement E-learning system will be the primary and important factor influencing their satisfaction.
Chapter 5 Research Conclusions

5.1. Findings and Contribution

My thesis researches factors Effect on the Benefits of E-Learning System using information system success model in Enterprises in Nam Dinh Province, Vietnam. The results indicate that both Use and User Satisfaction factor has significant positive relationships with Benefits of E-Learning System but User Satisfaction factor effects more than remain factor. This indicates that whether the E-learning system is used effectively or not depends primarily on the evaluation of end user’s satisfaction. The major reason explaining why E-learning system is implemented in enterprises, is to help enterprises’ employees to improve the efficiency in learning and applying this system into their work. Thus, the Use factor may have less effect on Benefits of E-Learning System. It can be said that, the User Satisfaction is the main factor affecting the Benefits of E-Learning System system in enterprises in Nam Dinh province.

However, all three factors (Information quality, System quality, Use) influence User Satisfaction and Use factor have an effect on the most. And all three factors (Information quality, System quality, User Satisfaction) also influence Use factor.

5.2. Implication

Despite its limitations, the study has both academic and practical implications.

In theory, my thesis gives an overview on E-learning system, Information System Success Models and E-learning success model However, my thesis has indicated that factors effect on the Benefits of E-Learning System using information system success mode in Nam Dinh Province of Vietnam.

In practice, from this conclusion helps managers of enterprises which have applied E-learning system can control and evaluate the effectiveness of their current E-learning system. It can be seen that, the two factors affect with each other. If the use of E-learning system is good, it leads to the rising of user satisfaction and vice versa. However, the effect of these two factors is indifferent levels

My thesis mentioned only one way of approach: factors effect on the Benefits of E-Learning System in Nam Dinh Province of Vietnam Based on IS success model.
However, through the results of this thesis, I hope that it will help enterprises’ managers or owners to understand more about the E-learning system in general and make reasonable decisions in implementing E-learning applications in their enterprises.

5.3. Limitation

Until today, there is little specific empirical research addressing this issue.

Firstly, the population from which the sample was drawn was limited to the SMEs located in Nam Dinh province which may influence the generalization of the findings.

Secondly the number of enterprises in Nam Dinh province, which have applied E-Learning system, is still few. This led to number of samples is limited.

The lastly, the use of survey questions via email affected the quality of the sample, because it cannot be controlled whether the respondents via email are people in need of questioning or not.

Because of the limitations of this study, we suggest the following ideas that further study could do.

The first is to expand research into big cities, where there are many enterprises which have deployed E-Learning system.

The second is to combine survey via email with direct interview.

The third, though thesis has researched important variables, future studies could focus on or expand to some variables e.g.

The lastly is to expand the scope of the respondents. It’s not only the IT and human resource management workforce, but it may be also customers, salespeople and enterprise’s managers or owners.
References


[12] Erdelina Kurti (2008), “Students’ experiences on eMesimi; an e-learning system in University of Prishtina, Kosova”, Reports from MSI - Rapporter från MSI.


[27] Robert W. Peterson, Mark A. Marostica, Lisa M. Callahan, ”Helping investors climb the e-Learning curve”, USbancorp–Piper Jaffray equity Research Re.


Appendix A: Research Questionnaire

PART 1: Demographic

Participants are asked to choose answers to examine factors influencing effectiveness of E-Learning System in enterprises in Nam Dinh Province, Vietnam. After reading and choosing question, you are required to answer following questions:

1. Sex
   □ Male □ Female

2. Ages
   □ Below 30 □ 30 - 39 □ 40 - 50 □ Over 50

3. Experience in IT
   □ Less than 1 □ 1 - 3 □ Over 5

4. Experience in human resource management
   □ Less than 1 □ 1 - 3 □ Over 5

5. Experience in E-Learning System
   □ Less than 1 □ 1 - 3 □ Over 5
PART 2: Finish your table of questions:

Then, you are required to fill-out below questions. To answer those questions, circle with the most appropriate on the scale provided.

5-point Scale:
- Strongly disagree
- Disagree
- Undecided
- Agree
- Strongly agree

Example: 1 2 3 4 5

<table>
<thead>
<tr>
<th>Variable</th>
<th>Content of Item</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Information Quality</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>E-Learning System is well organized</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-Learning System is effectively presented</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-Learning System is of the right length</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-Learning System is clearly written</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-Learning System is useful</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>System Quality</td>
<td>E-Learning System is up-to-date</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>----------------</td>
<td>--------------------------------</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td></td>
<td>E-Learning System is easy to use</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>E-Learning System is user friendly</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>E-Learning System is stable</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>E-Learning System is secure</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>E-Learning System is fast</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>The response time of E-Learning System is acceptable</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Service Quality</td>
<td>Your instructor of E-learning system is prompt</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Your instructor of E-learning system is responsive</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Your instructor of E-learning system is fair</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Your instructor of E-learning system is knowledgeable</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Your instructor of E-learning system is available</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Use</td>
<td>You think that the extent to which the course elements are accessed with PowerPoint slides</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>You think that the extent to which the</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>--------------------------</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>course elements are accessed with audio</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>You think that the extent to which the course elements are accessed with script</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>You think that the extent to which the course elements are accessed with discussion board</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>You think that the extent to which the course elements are accessed with case studies</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>You think that the extent to which the course elements are accessed with practice problems</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>You think that the extent to which the course elements are accessed with excel tutorials</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>You think that the extent to which the course elements are accessed with assignments</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>You think that the extent to which the course elements are accessed with practice exam</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td><strong>User Satisfaction</strong></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Overall, you feel satisfy with E-Learning System</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Benefits of E-Learning System</td>
<td>You enjoyed the learning experience</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-----------------------------------</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>You believe the system is successful</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>You think that you should recommend the course to others</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>E-Learning System helps me enhanced learning</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>You use E-Learning System to help me empowered</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>You use E-Learning System to help me time savings</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>You use E-Learning System to help me academic success</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>