FACTORS INFLUENCING PERCEIVED USEFULNESS & EASE OF USE OF DIGITAL LIBRARY TECHNOLOGY BY POST-GRADUATE STUDENTS IN MALAYSIA

by

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ABSTRAK

Penyelidikan ini bertujuan mengkaji faktor-faktor yang mempengaruhi tanggapan mudah guna dan tanggapan kebergunaan terhadap penggunaan perpustakaan digital di kalangan siswazah Malaysia. Sebanyak 140 set data dikumpul daripada pelajar-pelajar untuk mengkaji satu model tanggapan mudah guna dan tanggapan kebergunaan, ciri-ciri antaramuka, pembezaan individu, dan konteks organisasi. Kajian ini menyelidik pengaruh ciri-ciri antaramuka terhadap tanggapan mudah guna. Data ini diperoleh melalui borang soal selidik yang diedarkan kepada para pelajar-pelajar di USM (Pulau Pinang) dan MMU (Melaka) sahaja. Keputusan analisis statistik menunjukkan bahawa ciri-ciri antaramuka mempunyai pengaruh terhadap tanggapan mudah guna. Pembezaan individu, dan konteks organisasi juga didapati mempengaruhi tanggapan mudah guna. Analisis sampel menyarankan bahawa hanya beberapa faktor pembolehubah iaitu tanggapan mudah guna, teminologi, kerelevanan sistem, dan domain pengetahuan bertindak sebagai penyumbang signifikan. Oleh demikian, hanya beberapa hypothesis diterima sahaja. Satu lagi tujuan utama kajian ini adalah untuk menambah kepada ilmu pengetahuan yang terhad tentang tanggapan mudah guna dan tanggapan kebergunaan menggunakan perpustakaan digital terutama sekali dalam konteks Malaysia. Implikasi kajian dan cadangan kajian dibincangkan dalam bahagian akhir hasil kerja ini.

ABSTRACT

This project aims to study the factors that influence the perceived ease of use and perceived usefulness of digital library technology by post-graduate students in Malaysia. Based on the data collected from 140 full-time and part-time students, this study examined the model involving perceived ease of use, perceived usefulness, interface characteristics, individual differences, and organisational context. It tested the notion whether interface characteristics have an impact on perceived ease of use. Data were obtained via a survey questionnaire distributed to post-graduate students in Universiti Sains Malaysia (USM) and Multimedia University (MMU) campuses in Penang and Melaka respectively. Results of statistical analyses have suggested that interface characteristics do affect perceived ease of using digital library. Similarly, both individual differences and organisational context too have an impact on the perceived ease of using digital library. Analyses of the samples deduced that only certain factors of these variables i.e. perceived ease of use, terminology, system relevance, and domain knowledge actually served as significant contributors. Consequently, the hypotheses in relation to the above-mentioned variables were accepted. This study is also intended to add to the limited literature of perceived ease of use and perceived usefulness of digital library technology in the Malaysian context. The implication of this study and suggestions for future research are also discussed in the final chapter.

Chapter 1

INTRODUCTION

The proliferation of information resources available through new distribution networks are likely to promote fundamental changes on both institutions and personal habits for other forms of culture and scholarly work. Digital library is a computer-based system for storing, acquiring, organizing, searching and distributing digital materials for end user access. It requires less space and the data can be made available through communication networks to anyone anywhere while facilitating searches with speed (Sharma & Vishwanathan, 2001). As organizations rely more on digital technology to produce, process, store, communicate, and use information in their activities, the quantity of records being created in electronically form will increase exponentially (Lim, Ramaiah & Pitt, 2003). Digital libraries also can solve some problems facing print-based academic libraries (Dugdale, 1999). Organizations have adopted the use of internet technology and in particular the adoption of digital libraries in exchange of information and resources, co-operative projects to avoid duplication of efforts and bridging access to information to distant and disadvantaged communities (Magara, 2002).

The study attempts to examine the nature of the relationship between interface characteristics, individual differences, organisational context, perceived usefulness and perceived ease of use of digital library technology among post-graduate students in Malaysia. This research aims to add its results to the literature on how interface characteristics, individual differences, organisational context influence the perceived usefulness and perceived ease of use of digital library.

1.1   Background

The higher education sector is experiencing an unprecedented growth rate. This trend is largely a result of new enabling technologies that have facilitated the virtual delivery of academic programs. This has in turn led to libraries becoming key success factors in the virtual academic environment (Cahoy & Moyo, 2003).

Arms (2000) argued that the fundamental reason for building digital libraries is a belief that they will provide better delivery of information than was possible in the past. Traditional libraries are a fundamental part of society, but they are not perfect. The major advantages of digital libraries over traditional libraries include:-

(a) The digital library brings the library to the user. A digital library brings the information to the user's desk, either at work or at home, making it easier to use and hence increasing its usage. Traditional libraries require that the user goes to the library.

(b) Computer power is used for searching and browsing. Computer power can be used to find information. In most aspects, computer systems are already better than manual methods for finding information. Computers are particularly useful for reference work that involves repeated leaps from one source of information to another.   Paper documents are convenient to read, but finding information that is stored on paper can be difficult.

(c) Information can be shared. Placing digital information on a network makes it available to everybody. Many digital libraries or electronic publications are

maintained at a single central site, perhaps with a few duplicate copies strategically placed around the world. This is a vast improvement over expensive physical duplication of little used material, or the inconvenience of unique material that is inaccessible without travelling to the location where it is stored.

(d) Information is easier to keep current. Much important information needs to be brought up to date continually. Printed materials are awkward to update, since the entire document must be reprinted; all copies of the old version must be tracked down and replaced. Keeping information current is much less of a problem when the definitive version is in digital format and stored on a central computer.

(e) The information is always available. The doors of the digital library never close; usage of a library's digital collections can be done at hours when the library buildings are closed. Materials are never checked out to other readers, miss-shelved or stolen; they are never in an off-campus warehouse. When compared to the traditional library, information is much more likely to be available when and where the user wants it.

(f) New forms of information become possible. Most of what is stored in a conventional library is printed on paper, yet print is not always the best way to record and disseminate information. A database may be the best way to store census data, so that it can be analysed by computer; satellite data can be rendered in many different ways; a mathematics library can store

mathematical expressions, not as ink marks on paper but as computer symbols to be manipulated by programmes.

1.2   Research Problem

Given the above background, digital libraries would definitely facilitate research work and this should be accepted mainly by those involved in the field of research. However, recent studies showed that people still prefer to read from paper despite the progress in technology (Monopoli & Nicholas, 2001; Woodward, 1997; Borghuis, Brinckman, Fischer, Hunter, Loo van der, Mors ter, Mostert, & Zijlstra, 1996; Dijkstra, 1998). A survey by the Visual Arts Data Service (Grout and Rymer, 1998) indicated that the two most highly reported factors inhibiting the use of digital resources were a lack of time and a perception that the resources were of poor quality. In the traditional information environment human intermediaries, such as librarians and information scientists, find, analyse and evaluate information so that end-users are able to search easily, quickly, effectively and with confidence. Today, with many people searching themselves, the Internet is expected to take on board the role of the human intermediary. There is also an expectation that people are digitally literate (Monopoli, Nicholas, Georgiou & Korfiati, 2002). End-users do not always have the literacy, or the time, to search the Internet effectively for information that could support their work. The problem is compounded by the fact that the Internet as a whole is not well organised and information retrieval is inevitably a difficult and time-consuming process:

The sheer enormity of information available and the corresponding lack of

organisation of this information can prove an effective barrier to potential users

(Hiom & Huxley, 1996).

The end-users' perception of the ease of use and usefulness of digital libraries is one of the factors that would determine the acceptance of digital libraries. Thus, this study attempts to study the relationship between interface characteristics (especially terminology clarity, screen design, and navigation clarity) and perceived ease of use of digital library, the relationship between individual differences (especially computer self-efficacy, computer experience, and domain knowledge) and perceived ease of use of digital library, the relationship between organisation context (especially relevance, system accessibility, and system visibility) and perceived ease of use of digital library and the relationship between perceived ease of use and perceived usefulness of digital library.

1.3   Research Objectives

The objectives of this study are to find out:

(i)   The impact of interface characteristics on perceived ease of use of digital library.

(ii)   The impact of individual differences on perceived ease of use of digital library.

(iii)   The impact of organizational context on perceived ease of use of digital library.

(iv)   The impact of perceived ease of use on perceived usefulness of digital library.

1.4   Research Questions

The study attempts to answer the following questions:

(i)   Is there a significant relationship between interface characteristics and perceived ease of use?

(ii)   Is there a significant relationship between individual differences and perceived ease of use?

(iii)   Is there a significant relationship between organizational context and perceived ease of use?

(iv)   Is there a significant relationship between perceived ease of use and perceived usefulness of digital library?

1.5   Scope of Research

As digital library is a very wide subject, it is very important to establish the boundaries and assumptions underpinning this research. This research project is primarily concerned with enhancing our understanding of the factors that influence the perceived usefulness and ease of use of digital library technology among post-graduate students in Malaysia. This study examines the individual post-graduate student selected in Universiti Sains Malaysia (USM) and Multimedia University (MMU) campuses. Data collection was conducted on full-time and part-time students in USM and MMU at the Penang and Melaka campuses respectively by using survey questionnaires.

1.6   Significance of Study

The vast majority of research is typically concerned with technological issues. The importance and the absence of user-driven studies on digital libraries have been emphasized by a number of commentators (Brophy, 1999; Lancaster, 1977; Ashcroft & Langdon, 1999). There is limited research done in Malaysia on the end-users' perception of the ease of use and usefulness of digital libraries. Ultimately, the end-users' perception of digital libraries will affect their acceptance of the digital library technology. Thus, the current research primarily focuses on the relationship between perceived usefulness and perceived ease of using digital library by the end-user i.e. post-graduates in Malaysia.

1.7   Definition of Key Terms

Most frequently used terms in this study are perceived ease of use, perceived usefulness, interface characteristics, individual differences, and organisational context. Perceived ease of use is defined as "the degree to which a person believes that using a particular system would be free of physical and mental efforts" (Davis; 1989: p. 320). On the other hand, perceived usefulness is defined as "the degree to which a person believes that using a particular system would enhance his/her job performance" (Davis; 1989: p. 320). Digital library refers to a collection of information bearing artifacts whose unit records have been encoded in electronic formats in "digital" as opposed to "analog" mode and stored in machine readable form. As currently articulated, the concept bears several semantic connotations: electronic library; library without walls – virtual library (Kibirige & DePalo, 2001). Detailed definitions of the remaining items are given in Chapter 2.

1.8 Organization of Report

This study has been organised into five chapters. Chapter 1 covers background of the study, problem statement, research objectives, research questions, scope of research, significance of the study, and definition of key terms. Chapter 2 pursues on the related literature review. Chapter 3 presents the research methodology, formulation of the research hypotheses, outlining the details of samples, procedures, measurement instrument used and statistical analyses conducted to test the hypotheses. Chapter 4 deals with data analysis and presentation of findings using different statistical methods. Chapter 5 concludes the research, discusses survey findings and some limitations. It also discusses some implications and provides some suggestions for future research in this field.

Chapter 2

LITERATURE REVIEW

2.1   Introduction

This chapter discusses the factors influencing the perceived usefulness and ease of use of Digital Library technology by post-graduate students in Malaysia.

2.2   Overview of Library

A library is only an element in the process of creating, storing, culling, accessing, selecting and distributing information to customers (Wiederhold, 1995).   According to Neal (1997), the generally accepted key functions of a library include:

(i)   knowledge archival

(ii)   preservation and maintenance of culture

(iii)   knowledge dissemination

(iv)   knowledge sharing

(v)   information retrieval

(vi)   education and

(vii)   social interaction

2.2.1   Characteristics of Digital Library

The initial innovation is that the works (books, magazines, newspapers, records, videos, and the like) are stored in digital form. New formats and standards are being devised to deal with the variety and complexity of the information. The second innovation is in communication. Readers no longer need to come to the library; they

use electronic methods to have material delivered to them. The third difference is that the material is always copied from the master version of the work in electronic library. That means that the mechanical aspect of publishing and printing an inventory of books or magazines can disappear. A major issue associated with these changes is the management of copyrights in the electronic world, where traditional concepts, like fixing a work for long-term archival deposit and dissemination, are becoming less relevant (Garrett and Lyons, 1993).

2.2.2 User Acceptance of Digital Library

According to Hong, Thong, and Tam (2002), although huge sums of money have been spent on building "usable" digital libraries, research has shown that potential users may still not utilise them. Their study contributes to the understanding of user acceptance of digital libraries. Their findings indicate that perceived usefulness and perceived ease of use are determinants of user acceptance of digital libraries. In addition, interface characteristics and individual differences affect perceived ease of use, while organisational context influences both perceived ease of use and perceived usefulness of digital libraries. Interface characteristics in terms of terminology clarity, screen design, and navigation clarity, can positively affect perceived ease of using digital libraries. Organisational context variables, relevance and system visibility, can positively influence perceived usefulness of digital libraries. Finally, individual differences including computer self-efficacy, computer experience, and domain knowledge, can help users to interact with digital libraries more easily.

2.3   Factors influencing perceived ease of use and perceived usefulness

The factors that have been identified are as follows:

(i)   Interface characteristics

(ii)   Individual differences

(iii)   Organisational context

2.3.1   Interface Characteristics

Interface characteristics refers to the interaction between the system and the users. Interface characteristics comprise terminology, screen design and navigation. Terminology refers to the words, sentences, and abbreviations used by a system (Lindgaard, 1994). Screen design is the way information is presented on the screen (Lindgaard, 1994). Navigation is the ease with which users can move around the system (Lindgaard, 1994).

As cited in Hong, Thong and Tam (2002), interface characteristics were found to be significant determinants of perceived ease of use. Among them, terminology has the strongest impact on perceived ease of use of digital libraries. Clear terminology increases the ease of use of digital libraries by providing effective communication of system instructions and responses to users. To achieve terminology clarity, efforts must be made to match the system's vocabulary with users' language. Technical terms and jargons are to be avoided. If necessary, technical terms should be accompanied by clear explanations.

2.3.2 Individual Differences

According to Hong, Thong and Tam (2002), the relationship between individual differences and information systems success was first described in a theoretical framework proposed by Zmud (1979). Individual differences consist of computer self-efficacy, computer experience and domain knowledge. Computer self-efficacy is defined as an individual judgment of one's capability to use a computer (Compeau & Higgins, 1995, p.192). Computer experience refers to computer skill and length of use. Domain knowledge refers to user's knowledge in the subject domain.

Individual differences play a major role in determining user performance on information retrieval systems (Borgman, 1987; Chen, Czerwinski & Macredie, 2000). Previous studies have examined the impact of various individual factors on information system adoption behaviour (Igbaria et al., 1995; Jackson et al., 1997; Agarwal & Prasad, 1999). However, given the advances in virtual environments, especially through far-reaching technologies such as the World Wide Web, the effects of individual differences on the use of these newer technologies may not be fully explained by theories and methods developed for earlier generations of information systems (Chen, Czerwinski & Macredie, 2000). Therefore, there is a need for empirical research to examine the effect of individual differences in the new technology environment.

2.3.3 Organisational Context

Hong, Thong and Tam (2002) argued that organizational context variables were found to have significant impact on intention to use digital libraries through both perceived usefulness and perceived ease of use. Organisational context comprise relevance,

system accessibility and system visibility. Relevance refers to the integrability of the system into work practice, which is how smoothly the system fits into the person's or a group's work practices (Kling & Elliott, 1994). System accessibility is defined as the ease with which people can locate specific computer systems (Kling & Elliott, 1994). System visibility originates from the concept of system observability, which is one of the key characteristics of technology innovation identified by Rogers (1995).

Among the three organizational context variables, relevance showed the strongest effect on perceived usefulness, and was greater than the effect of perceived ease of use. This is consistent with Venkatesh and Davis's (1996) finding of a direct effect from job relevance to perceived usefulness of a number of management information systems. In order to increase the relevance of library content to students'information needs, digital library designers should pay more attention to user requirements analysis to discover their expectations and requirements for the content of digital libraries, and then incorporate relevant materials into the systems.

2.4   Theoretical Framework

The research model by Hong, Thong and Tam (2002) is to understand user acceptance of digital libraries by studying the impact of three system interface characteristics variables, three organisational context variables, and three individual differences variables on adoption intention through perceived usefulness and perceived ease of use of digital library. These nine external variables were used to investigate user acceptance of digital libraries.

Independent variables

Dependent variables

Interface characteristics

Terminology

Screen Design

Navigation

Organizational context

Relevance

System Accessibility

System Visibility

Individual Differences

Computer self-efficacy

Computer experience

Domain knowledge

Perceived
Usefulness

Perceived
Ease of Use
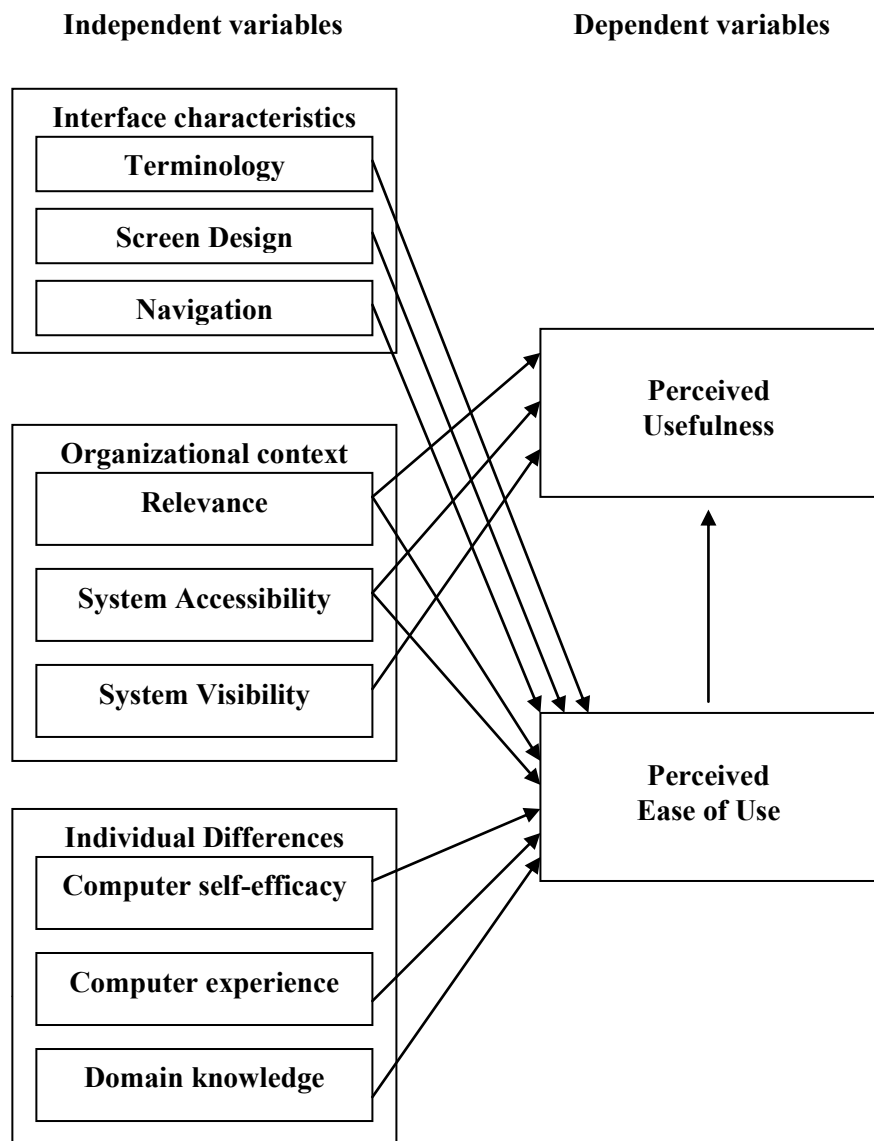
Figure 1. Schematic Diagram of Theoretical Framework

The theoretical framework of this study was developed by adapting the research model on understanding user acceptance of digital libraries (Hong, Thong & Tam, 2002). It involves factors that influence the perceived usefulness and perceived ease of using digital library among post-graduate students in Malaysia. The framework differed from the research model developed by Hong, Thong and Tam (2002) since it did not include the behaviour intention variable (See Figure 1).

2.5　Hypotheses

There were ten (10) main hypotheses formulated for this study. The following sections will present these hypotheses.
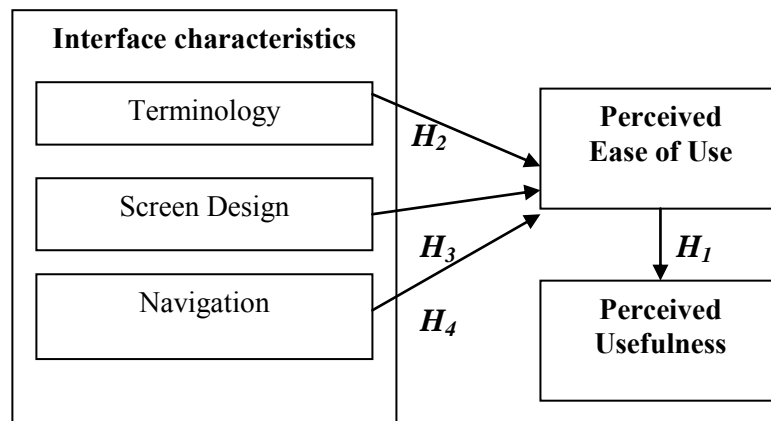
Figure 2. Impact of interface characteristics variables on perceived ease of use

Davis, Bagozzi, and Warshaw (1989) identified ease of use as an important determinant of system usage through *perceived* usefulness. Mathieson (1991) also reported similar findings that perceived ease of use explains significant amount of the variance in perceived usefulness. Therefore, the first hypothesis is formulated:

H_1:　*Perceived ease of use has a direct influence on perceived usefulness of the Digital Library.*

The perceived ease of use is influenced by terminology clarity, screen design, and navigation clarity.

According to Talja, Heinisuo, Kasesniemi, Kemppainen, Luukkainen, Pispa, and Jarvelin (1998), one major problem with the Digital Library is inappropriately used

jargons. Digital library's success depends on how users interact with the system. Thus, this leads to the second hypothesis:

H₂: *Terminology clarity will positively influence the perceived ease of using the Digital Library*

Todd and Benbasat (1992), Lim, Benbasat and Todd (1996) argued that the way information is presented on the computer screen is capable of influencing user's information search strategies and performance. Meanwhile, Hu, Ma and Chau (1999b) and Liu et al (2000) stated that graphical user interfaces were found to enable richer interaction with users in both retrieval systems and digital libraries. Thus, this leads to the third hypothesis:

H₃: *Screen design will positively influence the perceived ease of using the Digital Library.*

Dillon (2000) argued that users often become disoriented when they try to locate digital information. Meanwhile, Marchionini et al (1998) stated that the major reason for disorientation is due to the cognitive load necessary to navigate a conceptual space with a complex structure and few landmarks. Digital libraries can make it easier for users to follow the logical flow and conduct more efficient search by providing navigation aids or enhancing the amount of unique landmarks. This leads to the fourth hypothesis:

H₄: *Navigation clarity will positively influence the perceived ease of using the digital library.*
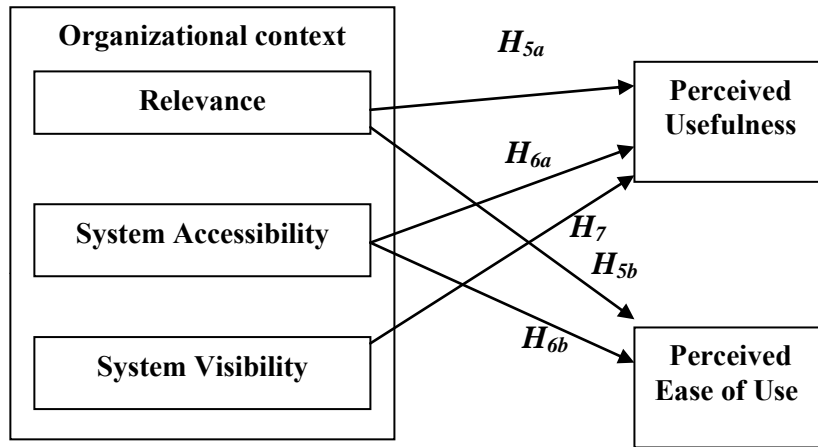
Figure 3. Impact of organisational context variables on perceived usefulness and

   perceived ease of use

Gluck (1996) argued that there is a strong relationship between relevance and user satisfaction with information systems. Meanwhile, Yao (1995) stated that users tend to find useful documents to be relevant. Thus, this leads to the hypothesis:

H_{5a}:   *System relevance to postgraduates' needs will have a positive influence on the*

   perceived usefulness of the digital library.

The user's search effort is more likely to be more productive and effective if there is relevant information. Thus, the user will perceive the Digital Library as easy to use. As such, the following sub-hypothesis is formulated:

H_{5b}:   *System relevance to postgraduates' needs will have a positive influence on the*

   perceived ease of using the digital library.

According to O'Reilly (1982) and Culnan (1983) and Hardy (1982), perceived accessibility was one of the important determinants of the frequency of using information sources and the selection of information channels. On the other hand, Kraemer, Danziger, Dunkle and King (1993) stated that greater accessibility of computer-based information contributes to greater usefulness of the information to the managers. System accessibility will also enhance user's perception of the ease of using digital libraries. Thus, the following sub-hypotheses are formulated:

H_{6a}:   *System accessibility to postgraduates will have a positive influence on the perceived usefulness of the digital library.*

H_{6b}:   *System accessibility to postgraduates will have a positive influence on the perceived ease of using the digital library.*

Rogers (1995) stated that observability refers to the degree to which the results of an innovation are visible and communicable to others. Meanwhile, Moore and Benbasat (1991, p.203) mentioned that a potential adopter is more likely to adopt an innovation if it's more visible. Thus, this leads to the seventh hypothesis:

H_7:   *System visibility to postgraduates' needs will have a positive influence on the perceived usefulness of the digital library.*
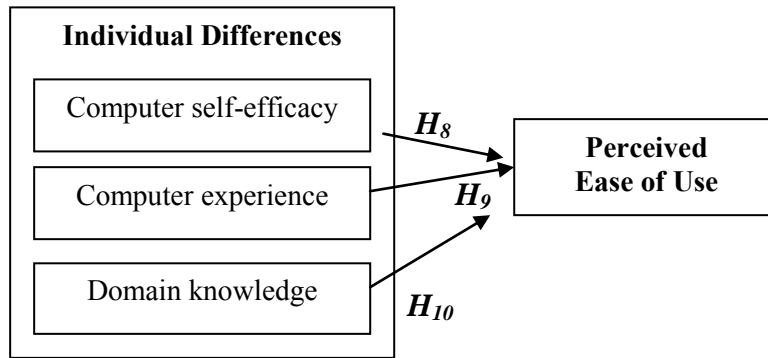
Figure 4. Impact of individual differences variables on perceived ease of use

According to Compeau and Higgins (1995), computer self-efficacy refers to an individual judgment of one's capability to use a computer. Meanwhile, Venkatesh and Davis (1996) discovered that computer self-efficacy has a positive impact on general computer usage behaviour.

H_8:   *Computer self-efficacy will have a positive influence on the perceived ease of using the digital library.*

Wang, Tenopir, Layman, Penniman and Collins (1998) argued that general computer experience can affect successful interaction with personal computers, the World Wide Web, and information retrieval systems. However, Thompson, Higgins and Howell (1994) mentioned that within the context of information technology, both self-reported computer skill and length of use should be measured because they represent distinct dimensions of general computer experience. Therefore, more computer experience shall lead to higher level of perceived ease of use:

H_9:   *Computer experience will have a positive influence on the perceived ease of using the digital library.*

According to Marchionini, Lin and Dwiggins (1990), domain experts were found to conduct faster and more focused searches than novices in a study of information seeking behaviour. On the other hand, Meadow, Wang, and Yuan (1995) argued that domain knowledge can help users separate relevant information from irrelevant ones and thus increase effective searches.   Thus, this leads to the tenth hypothesis:

H_{10}:   *Domain knowledge will have a positive influence on the perceived ease of*
        using the digital library.

2.6   Summary

Based on what previous studies have shown, interface characteristics and individual differences variables evidently had impact on the perceived ease of use of digital library applications.   Hong, Thong, and Tam (2002) had mentioned that three categories of external variables namely interface characteristics, organisational context, and individual differences were important predictors of perceived usefulness and perceived ease of use of digital libraries.   Whether the same results can be obtained or not for the Malaysian sample will be answered after the hypotheses are tested, and findings interpreted.

Chapter 3

RESEARCH METHODOLOGY

3.0   Introduction

This field study was conducted in a non-contrived setting. It intends to investigate the factors that influence the perceived ease of use and perceived usefulness of digital library among post-graduate students in Malaysia. It analyses the factors of three independent variables, which are interface characteristics, individual differences, and organizational context on two dependent variables namely, perceived ease of use and perceived usefulness.

This chapter outlines the research methodology used in this study. The chapter consists of research site, sample, procedure, measures, and statistical analyses carried out to identify the findings for the research questions.

3.1   Research Site

Data were collected from post-graduate students in Penang and Melaka due to convenience of sampling. The unit of analysis was the individual post-graduate student in USM or MMU campuses in Penang and Melaka respectively.

3.2   Sample

The sample was made up of 140 post-graduate students in USM and MMU campuses. Out of this figure, 97 samples were obtained from USM students while 43 samples were from MMU students. The convenience sampling method was adopted to

conduct this study. These students were from various age groups and races, with differing annual incomes. Data collection was by means of a structured questionnaire as presented in Appendix A.

3.3   Procedure

For the purpose of the study, a questionnaire was constructed. Data was collected from the respondents in various places on campus such as library and classrooms through course mates and friends. Most respondents took 15 minutes to complete the questionnaire. Out of a total of 300 questionnaires distributed, only 164 were returned. Twenty four questionnaires were found to be either incomplete, answered improperly, or were from respondents who did not fulfill the criteria of being digital library users. This resulted in the final number of 140 valid questionnaires. As such, the response rate was 46.67%.

3.4   Measures

The survey questionnaire was divided into six sections:

(i)   Section A: Perception on the ease of using digital library.

(ii)   Section B: Perception on the usefulness of digital library.

(iii)   Section C: Individual differences in relation to digital library.

(iv)   Section D: Interface characteristics in relation to digital library.

(v)   Section E: Organisational context in relation to digital library.

(vi)   Section F: Demographic questions.

The entire questionnaire required respondents to rate items using a 7-point scale, except for the last section on demographic data. A total of 51 questions were administered and the summary is shown in Table 3.1.

Table 3.1

Summary of Questions in Questionnaire

Variables	Item Number	Source
Individual Differences	1, 2, 3, 4	Hong, Thong & Tam (2002).
Interface Characteristics	1, 2, 3, 4, 5	Hong, Thong & Tam (2002).
Organisational Context	1, 2, 3, 4	Davies & Travica, 1997
Perceived Ease of Use	1, 2, 3, 4, 5, 6	Hong, Thong & Tam (2002).
Perceived Usefulness	1, 2, 3, 4	Hong, Thong & Tam (2002).

3.5   Statistical Analyses

Data collected were processed and analysed using Statistical Package for Social Sciences (SPSS version 11). Systematic data analysis flow as suggested by Sekaran (2000) was followed in preparing data for analysis, recoding of variables, descriptive statistic, reliability analysis and regression analysis.

3.5.1   Factor Analysis

Factor analysis was the first step of the series of analyses conducted on the sample data. It identifies the separate dimensions of the structure of both independent and dependent variables, then determines the extent to which each variable is explained by each dimension (Hair, Anderson, Tatham & Black, 1998).

Factor analyses were conducted for all five variables: Perceived Ease of Use (PEU), Perceived Usefulness (PU), Individual Differences (ID), Interface Characteristics (IC), and Organisational Context (OC). Firstly, using the Principal Components Analysis technique, factors were extracted based on the eigenvalues, which has to be equal to and more than 1.00 (Hair et al., 1998). Within a factor, items will be chosen if the factor loading is greater than or equal to 0.5 and cross loading with other factors generally smaller than 0.30 (Hair et al., 1998).

3.5.2 Reliability Analysis

The reliability analysis ensured items within a factor were measuring the same dimension and that the scale is not ambiguous (Green, Salkind, & Akey, 1997). Cronbach's alpha coefficient was used to assess the reliability of each factor. Similarly, it satisfied us for stability and consistency of the concept. The means, standard deviation, and all inter-correlation among all study variables will be computed to see the variability.

3.5.3 Multiple Regression Analysis

The output generated by this analysis must be checked to identify outliers using the Casewise Diagnostics tool. The outliers stated are removed accordingly, and the simple linear regression analysis is re-run until no outliers are found. The final results are the ones used to explain the findings. Outliers are important as they can distort the final results (Hair et al., 1998).