

CHAPTER ONE

INTRODUCTION

1.1 E-books in Malaysian academic libraries

Academic libraries play an important role as providers of multisources of information in higher educational institutions. With the advent of new technologies for storing, accessing and transmitting information, information provision in higher educational institutions has experienced many changes, especially in the last 20 years, from online public access catalogue (OPAC), Compact Disk Read On Memory (CD-ROMs) to full-text electronic journals that are accessible remotely through the library web sites.

Today, electronic book or e-book is seen as the latest emerging technology for disseminating and delivering of information and has been utilised in several libraries in the United Kingdom (UK), United States (US), Australia and other developed countries. In the US for instance, e-book collections have been pioneered successfully with a range of services based upon lending portable devices as well as online e-book vendors such as NetLibrary and OverDrive. However, the publishing and use of e-books in UK is far less active due to lack of interest among commercial e-book vendors in UK (McKnight and Dearnley 2003).

Researcher investigation of 14 Malaysian academic libraries web sites that provide several databases including electronic journals, found that only 6 (43%) of the libraries currently provide access to e-books for its users. These include International

Islamic University Library (IIUM); University of Malaya Library (UM); Universiti Sains Malaysia Library (USM); Universiti Utara Malaysia Library (UUM); Open University Malaysia library (OUM) and Universiti Tun Abdul Razak Library (UNITAR) (Refer Table 1.1).

Table 1.1: Provision of E-Books in Malaysian Academic Libraries.

No	Library	Provision of e-books	Publisher
1.	International Islamic University Library (IIUM)[http://www.lib.iiu.edu.my/]	Yes	NetLibrary
2.	Universiti Kebangsaan Malaysia (UKM) [http://pkukmweb.ukm.my/~library/]	No	-
3.	University of Malaya (UM) [http://www.umlib.um.edu.my/]	Yes	Ebrary.com Books24X7.com
4.	Universiti Malaysia Sabah (UMS)[http://www.ums.edu.my/library/mukadepan.html]	No	-
5.	Universiti Malaysia Sarawak (UNIMAS)[http://www.unimas.my/en/cais/]	No	-
6.	Universiti Sains Malaysia (USM)[http://www.lib.usm.my/]	Yes	Ebrary.com
7.	Universiti Teknologi Malaysia (UTM)[http://www.psz.utm.my/]	No	-
8.	Universiti Tenaga Malaysia (UNITEN)[http://www.uniten.edu.my/go/library/]	No	-
9.	Universiti Utara Malaysia (UUM)[http://www.lib.uum.edu.my/website/]	Yes	Ebrary.com
10.	Universiti Teknologi MARA (UiTM)[http://www.uitm.edu.my/ptar]	No	-
11.	Universiti Multimedia [http://vlib.mmu.edu.my/]	No	-
12.	Universiti Tun Abdul Razak (UNITAR)[http://vlib.unitarklj1.edu.my/]	Yes	Netlibrary
13.	Kolej Sultan Zainal Abidin (KUSZA)[http://www.kusza.edu.my/]	No	-
14.	Open University Malaysia (OUM) [http://www.oum.edu.my/]	Yes	Books24x7.com Ebrary.com xReferplus.com

The most popular publishers are ebrary, NetLibrary and books24x7. The delivery mode of these publishers suggests one possible service model for our local libraries. For instance, ebrary (www.ebrary.com) serves the libraries with variety of full-text databases of journals, magazines, newspapers, or other kinds of reference content for users. It is licensed at population-based rates (which include free updates) that enable simultaneous, multi-user access, feature advanced research tools (such as cross-searching and integrating with a library's existing electronic resources) with Machine Readable Cataloging (MARC) records provided. As the ebrary uses Portable Document Format (PDF) technology, called 'ebrary Reader,' users can read the full-texts of books on screen with an interface resembling the print document (ebrary, Inc, 2004).

NetLibrary (www.netlibrary.com) is another example of personal computer based or device-independent e-books, which provides a turnkey system for libraries based on the traditional circulation model. It is a division of OCLC (Online Computer Library Center) that offers libraries with an easy-to-use information and retrieval system for accessing the full text of reference, scholarly and professional books. Moreover, netLibrary has been successful at signing on a number of university presses, thereby making its offerings particularly enticing for colleges and universities. Since the user is not required to have a particular reading device to use the e-books, libraries need not stock nor manage any special hardware. However, only one user can view a Netlibrary book at a time (Netlibrary, 2004; Tennant, 2000).

Similar companies that provide web-based e-books include Books24x7 (www.books24x7.com) and xReferplus (www.xreferplus.com.de). With more than 5

million users under contract, Book24x7 is primarily focused on technical books related to Computer Science and Information Technology. On the other hand, xReferplus is a giant online reference library that provides access to a selection of reference books such as encyclopedias, dictionaries, thesauri and books of quotations. It also includes a wide range of subject-specific titles covering art, accountancy, law and literature. Uniquely, xReferplus provides a network of cross-references that allow users to refer to related information contained anywhere within the book or across different books within the collection (xReferplus.com, 2004).

Although there are a number of e-books service provided by several Malaysian academic libraries, not much information could be gathered on the current status of use of this service as no formal research studies could be located to answer this question.

1.2 E-books Service at University of Malaya Library (UML)

University of Malaya Library (UML) is the oldest and one of the leading academic libraries in Malaysia. Throughout the years of its establishment, the UML continuously strives to improve its print and electronic collection as well as its services. Electronic book (e-book) has been a recent service made available through the UML web site. The e-books service has been included in the UML since 2001. The Library has to date subscribed two full-text e-books databases, namely Books24x7.com and Ebrary. These databases allow users for quick searching, browsing and reading of relevant titles via the UML web site within the campus network.

Since 2001, the UML has a shared ownership of a collection of 2,457 Books24x7.com e-book titles. This database provides full content of electronic books and journals covering the fields of Computer Science and Information Technology from prominent publishers like Microsoft Press, Osborne/McGraw Hill, Artech House, AMACOM, ASTD Press, Berrett-Koehler, Harvard Business School Publishing, John Wiley, MIT Press, Oxford University Press and many others.

The library also provides access to more than 12147 Ebrary titles of electronic books on multi-disciplines since 2001. The Ebrary titles cover language and literature, social science, medicine, history, science and technology and philosophy from publishers, such as McGraw-Hill, Random House, Penguin Classics, Taylor & Francis, Yale University Press, J. Wiley, Greenwood and many others. Registered library users are allowed to print and download any e-book page(s) through a request at Clients' Services Division of the UM Main Library.

1.3 Statement of Problem

The basic role of the library is to act as a central collector and provider of multi-sources of information for its patrons, as what, when and how they need them. However, it is generally impossible for a library to satisfy the diverse needs of its users. Therefore, it is necessary for a library to evaluate its services to measure the effectiveness of the services in order to justify decisions on the purchase or subscriptions of certain sources, which are costly.

As stated by Lonsdale & Armstrong (2000) cited in Sawyer (2001), a preliminary review of the available literature reveals much recent hype, activity and comment but still little research, especially in the area of e-books services as opposed to journals. This similarly applies in Malaysia, as there are still little information about the provision and use of e-books in Malaysian academic libraries when compared to other type of electronic resources such as CD-ROMs, e-journals, online databases, OPACs, and Internet. Furthermore, there are no research studies at the national level that could be located to explore the current stage of e-books services at Malaysian academic libraries. Hence, the real insight on the perception of users towards e-books, their usage pattern, purposes, reasons of users using the e-books are still not clear.

The study is essential to gain a picture of opinion and feedback about the e-books services in order to identify ways of improving the services in the future. Moreover, the study is also necessary in order to examine the current situation and provide a guideline for comparison for other academic libraries and small libraries across the country, which are considering providing e-books service in the future.

It is also generally assumed that every library user understands what an e-book is actually is. However, based on the literature there is still no standard definition for e-book and as a result different researchers define e-book diversely as they use and perceive e-book differently.

It is also generally assumed that Information Technology (IT) related students including students from Computer Science and Library and Information Science are

more likely to use e-books services compared to those in the Art and Humanities. This is because they have better exposure to current IT applications and good background of computer literacy.

Moreover, it is often assumed that the IT related students are more likely to use e-books because of the amount of time they spend on using the Internet and their needs for fast and easy access for large amount of information. However, these assumptions have never been investigated at the University of Malaya.

Therefore, this study is designed specifically to provide current insight on the perception of undergraduate students towards e-books service and the usage pattern of e-books in terms of where, when and why they use the service. This study also attempts to determine if there are non-users among the students and their reasons for the non-use and identifies the students' preference of e-book versus printed book.

1.4 Operational Definitions

The following operational definitions are applied in this study;

- 1.4.1 The discussion of the term the 'e-book' or 'electronic book' applies to a digital book that can be read on a computer screen. This will include all the device-independent e-books provide by netLibrary, Ebrary, xReferplus and Books24x7.com. This definition will also include e-books that need specific desktop reader or special software to read the e-text on the computer screen such as Microsoft Reader and Portable Document Format (PDF).

- 1.4.2 The term e-text or electronic text refers to text that is available in an electronic format such as in Word documents, TXT or HTML.
- 1.4.3 The e-reader or electronic reader refers to an electronic reading device including dedicated reader, handheld reader and desktop readers, such as the Rocket eBook, SoftBook Reader, Digital Personal Assistants (PDAs) and Palm Pilots.
- 1.4.4 Perception of e-books refers to the users' understanding towards an electronic book in term of what an 'e-book' is as well as their understanding towards the importance of e-books service at the University of Malaya Library (UML).
- 1.4.5 Use of e-books in this study refers to the users' usage pattern in terms of when, where, how and why they use the e-books.
- 1.4.6 Textbook refers to a printed or an online book that is used in the university for formal study of a subject.
- 1.4.7 Reference book refers to a printed or on online material that contain miscellaneous facts and information, which is normally not read from cover to cover. These include manuals, dictionaries, thesauri, encyclopedias, almanacs, handbooks, yearbooks, bibliographies, biographies, directories, maps, statistics, indexes and abstracts.

1.4.8 Information Technology (IT) student in this study refers to a student who registers for any of the degree programmes that relates to the field of Information Technology or Computer Science.

1.4.9 User of e-books or e-books user refers to a person who uses any of the e-books services (at least once prior to this survey) available via the web site of the UM Library, other libraries' web sites or from other free webs or homepages prior this survey.

1.4.10 Non-user refers to a person who has never used the e-books prior to this survey.

1.5 Significance of the Study

This study aims to gather and analyse relevant data, which can provide the necessary information of the existing usage pattern of e-books specifically among undergraduate students at the Faculty of Computer Science and Information Technology, University of Malaya.

Secondly, these findings will help the librarians of UML to understand the information seeking behavior of the undergraduate students, especially among users and non-users of e-books. Therefore, librarians can more appropriately serve their information needs.

Thirdly, these findings are also very useful for the management of UML to create an action or development plans to overcome current problems faced by students when using the e-books.

Fourthly, it will help the UML to increase the quality of e-books services and most importantly to justify decisions on the purchase or subscriptions of e-books services, which are costly.

Moreover, the study is necessary in order to understand the current situation and provide a guideline for comparison, for other academic libraries and small libraries across the country, which considers providing e-books service in the future.

This study may also help other researchers and students to gain an insight into how this research could be conducted and further improve upon it using a similar or different population. Hopefully, this study will help to close the gaps as there is still little information and research on provisions and usage of e-books in Malaysian libraries when compared to other type of electronic resources.

1.6 Limitation of the Study

There are several limitations of this study such as:

- 1.6.1 Undergraduate students from other faculties in the University of Malaya, Kuala Lumpur are not included as sample in this research due to limitation of time and cost. Only undergraduate students at Faculty of Computer Science and Information Technology are involved in this study.

- 1.6.2 The sample size of this research is small, therefore generalisation of the conclusion to larger population cannot be made.
- 1.6.3 The scope of this research specifically covers on the perceptions of e-books in term of its definition; the importance of e-books service at the UML and usage of e-book among undergraduate students as when, where and why they use e-books.
- 1.6.4 The students' demographic information such as age, race, parent's occupations, geographic background, name of programme, semester and the academic year of study are collected to understand the general background of the students. Therefore, there are not be using as variables to study the relationships in the use of e-books.
- 1.6.5 However, researcher is only using gender to make comparisons between the gender and the selected instances. It is useful to explore the relationships between the male and female students in their e-books' usage patterns and to determine the characteristic of the e-books users and non-users.
- 1.6.6 One of the aspects of this research is to determine the actual percentage of e-books data that students cite or include in their works or bibliographies and will not investigate on the general percentage of e-books use in the students'

works. Although, students may use e-books but not necessarily cite them in their bibliographies.

1.6.7 Moreover, the scope of this research does not cover on other issues such as the e-book policy at the UML; use of specific e-books features; and the relationship between reading habit and the e-books use, although they are significant for this study.

1.7 Objective of the Study

The objective of this study is to gather and analyse relevant information, which will provide the necessary data to:

- (a) Identify students' perception and understanding of electronic book in terms of what an 'e-book' is, and the importance of e-books service at the University of Malaya Library.
- (b) Determine the usage of e-books among undergraduates specifically to identify;
 - (i) The impression of using e-books;
 - (ii) The gateways used to access the e-books;
 - (iii) The place where students access the e-books;
 - (iv) The time spent to access the e-books;
 - (v) The subjects of e-books most used by students;
 - (vi) The purpose(s) of using the e-books;
 - (vii) The percentage of e-book data being included/cited in the students' works; and

- (viii) The reasons of using e-books.
- (c) Determine if there are non-users among the undergraduates and their reasons for non-use.
- (d) Identify students' preference of e-book to printed book.

1.7 Research Questions

Based on the objectives described earlier, the relevant data are sought to answer the following research questions:

- (a) How is an 'electronic book' perceived by students?
- (b) What are students' perception towards the e-books service at the University of Malaya Library?
- (c) What is the student's impression of using the e-books?
- (d) What is the gateway use by the students to access the e-books?
- (e) Where do the students mostly access the e-books?
- (f) How frequently do the students access the e-books?
- (g) What is/are the subject(s) of e-books most used by students?
- (h) What is the primary purpose of students using the e-books?
- (i) What is the percentage of e-book data being cited in the students assignments, projects or bibliographies?
- (j) What are the reasons for using and not using the e-books?
- (k) What is the students' preference between an e-book and a printed book?

1.9 Assumptions

This study is based on the following assumptions:-

- (a) Computer Science and Information Technology (IT) students are more likely to use e-books because of their knowledge in IT applications.
- (b) The great exposures of IT influenced to a great extent the involvement of students in the use of e-books.
- (c) Computer Science and IT undergraduate students are more likely to use e-books because of the amount of time they spend on using the Internet; their level of computer literacy; and their needs for fast and easy access for large amount of information.

1.10 Organisation of the Report

This study is divided into five chapters. Chapter 1 introduces the study with the importance of research problem, objective, scope and limitations of the study. Chapter 2 presents the review of relevant literature related to the study. Chapter 3 describes and explains the procedures and methodology applied in the study. These include the sources of relevant data, detailed description of the data collection and explanation of procedures to facilitate better understanding of how the study is carried out. Chapter 4 reports the analysis of findings in descriptive form and graphical formats. Chapter 5 summarises, explains and interprets the research findings.

CHAPTER TWO

LITERATURE REVIEW

This literature review is intended to provide a background to the study through an overview of the previous and current studies conducted on the use of electronic book (e-book) among undergraduates. The review covers on the areas of user perception of what an e-book is; acceptance, usage and non-usage of e-book; and user preference of e-book to printed book.

2.1 Approach to the Literature Review

An extensive search of the relevant literature was conducted to gain an understanding of the studies and surveys that are related to the use of e-books. The literature on the topic was obtained from searching the online public access catalogue (OPAC) and online databases namely *BUBL*, ERIC, HW Wilson Web, *Library Literature* and *Proquest Online Dissertations*. Searching was also carried out from several CD-ROMs databases such as LisaPlus and UMI's Dissertations. Relevant articles were also retrieved from other primary sources including journals at the University of Malaya Library and via the Internet. This literature review relied largely on the research studies written by other researchers worldwide, since the availability of local resources related to this research topic was very limited.

The keywords that were used to retrieve the relevant articles on this topic included "e-book usage", "electronic books usage", "e-book definition", "e-book AND academic libraries", "e-book history", "e-books usage AND undergraduates" and "e-books usage AND printed books". The review is summarised in the following

sections: a) perception of what an e-book is; b) history of e-book; c) e-book in libraries; d) acceptance of e-book; e) researches on the usage of e-book; f) reasons for non-usage; and g) user preference: e-book or printed.

2.2 Perception of What an E-book Is.

Generally, the term e-book or electronic book applies to the content of printed book that can be read on a computer screen in an electronic form. Some e-books can also be read on an electronic device such as a Palm or other handheld computer. 'Digital book', 'Online book', 'Web book', 'Digital text', 'Electronic text' or 'eBook' are the synonymous terms that have been used for 'e-book'. Thus, based on the literature, e-books have been defined diversely by researchers to fit they own expectations.

Some researchers defined e-book as 'e-text'. E-text or electronic text is text that is available in an electronic format such as in Word documents, TXT or HTML. As defined by Ormes (2002), e-book is a text or monograph which is available in an electronic format such as a novel on a web and short story available in Word. Hawkins (2000), McKnight & Dearnley (2003) and Vidana (2003), also focused on the contents [e-texts] of a book made available in an electronic form. Similarly, Saurie and Kaushik (2001) referred to e-book as book converted into digital form to be read on a computer screen. Thus, e-books refer to the information content rather than the format or playback device (Desmarais, 1994).

Another interpretation of an e-book is to include 'e-text' and 'e-reader'. This is because some e-texts have been formatted to be read only by particular e-readers. The e-reader or electronic reader is typically referred as an electronic reading device including dedicated reader, handheld reader and desktop reader. As highlighted by Goh (2002), dedicated readers such as Rocket eBook and SoftBook Reader are specifically designed to be used for reading e-books. On the other hand, Personal Digital Assistants (PDAs) and Palm Pilots are examples of the handheld readers used to read e-books. Moreover, desktop readers refer to special software such as Microsoft Reader and PDF, which make reading off a PCs or laptop screen easier.

As defined by Lynch (2001), "e-book refers as more accurately as 'electronic book readers' ". He also emphasised the importance to distinguish between the idea of a digital book and the viewing technology. As according to him, a digital book is just a 'content' or a large structured collection of bits that can be transported on CD-ROM or storage media or delivered over network connection, and which is designed to be viewed on some combination of hardware and software (the viewing technology).

Similarly, Abrew (2001) also described that e-book data starts its "life" as e-text, usually plain text or text marked up in HTML. This data then must be converted through a software-based translator into a format readable and displayable by the hardware. Therefore according to him, the e-book connotes hardware or software combination used to read electronic data on a portable electronic device specifically designed for such purposes. Thus, e-book hardware is intended to do just one thing, read e-book data.

Grant (2002) has extended the definition of e-books to include both e-book as e-text and e-reader. According to him, e-books as digital books are purchased online and downloaded by consumers to their computers or e-book reading devices (ERDs). For him, e-books represent an all-digital version of the traditional book-acquisition model in which consumers purchase a physical book.

Similarly, Connaway (2003) defined an e-book as based on emulating the basic characteristics of traditional books, but in an electronic format which leveraging Internet technology to make its easy and efficient to use. According to her, e-book can take the form of a single monograph or a multi-volume set of books in a digital format that allows for viewing on various types of monitors, devices and personal computers. She further described “an e-book is the intellectual property of the author who develops it and is owned by the copyright holders”.

Rao (2003) on the other hand, has given a more comprehensive definition for an e-book as “text in digital form, or book converted into digital form, or digital reading material, or a book in a computer file format, or an electronic file of words and images displayed on a desktop, note book computer, or portable device, or formatted for display on dedicated e-book readers”.

By looking at those definitions, the term e-book has been used differently by the researchers, as there is still no accepted definition for it. Generally, the term “electronic book” or “e-book” is used in the literature to refer to the content (e-text), hardware (that is the viewing technology such as dedicated reader and handheld

reader) or software (desktop readers). Thus, those features form essential and common elements of what constitutes an e-book.

2.3 E-book History

E-books have been around for at least three decades. The term ‘electronic book’ was coined by Andries Van Dam, a professor of technology at Brown University. The birth of e-books started when Project Gutenberg at the University of Illinois (<http://gutenberg.net/history.html>) started digitising books in 1971. The projects offered the content of book titles in the public domain, keyed into electronic format and made accessible for free on the Internet.

At the same time, Kay, envisioned the future existence of Dynabook, a portable interactive personal computer, as accessible as a book (Kay and Goldberg, 1977 in Wilson, 2001). The ideas behind it led to the development of the Apple Newton MessagePad, the world’s first PDA, which was capable of displaying electronic titles in NewtonBook Format and hundred of e-books were produced but the product was discontinued in 1998 when lighter Palm Pilots entered the market (Apple, 1998 in Wilson, 2001).

The first commercial packages of electronic books appeared around the time the first CD-ROMs did, as soon as it became practical to scan full text into a computer and convert it to digital files. The *Library of the Future* was one of the first such products (Mullin, 2002).

The Seybold Report on Internet Publishing (1999) also reported that publishers have digitised books for more than a decade. During the early 1990s, Sony attempted various versions of portable electronic books, but did not succeed. At the same time, encyclopedia on CD-ROM, combining interactive features and multimedia, became popular with consumers.

Later, Adobe Acrobat or widely known as PDF (Portable Document Format) was introduced as a commercial software product for publishing and viewing electronic text. It is widely available free for downloading at (<http://www.adobe.com/support/downloads/main.html>). However, hand-held devices for reading e-books began to be developed in the latter half of 1998. 3Com Corporation and its Palm Organizers may have been catalysts as publishers and entrepreneurs to capitalise efforts into developing electronic books (Ardito, 2000).

Only within the past two years e-books become popular with publishers, libraries and vendors, largely attributed by the computing evolution, storage technology, Internet revolution and the successful introduction of electronic journals (Goh, 2002; Mullin 2002; Long, 2003; Rao, 2003).

The recent developments offer several ways in which an e-book can be made available to a reader. Firstly, e-books can be encoded for use with dedicated reading software or desktop reader (Microsoft Reader and Acrobat e-book Reader) used on personal computers (PCs) or handheld readers such as PDAs and Palm pilots; they also can be delivered via the Web using standard Web browser (NetLibrary and

Ebrary); others are contained on a CD-ROM for use in a computer and some need a dedicated hardware reading device or dedicated reader such as Rocket e-book or Softbook. Recently some e-books can be read both on the PC screens and handheld devices (McKnight and Dearnley, 2003).

2.4 E-books in Libraries

The basic concept of the library is to act as a central collector and provider of information for its patrons, as what, when and how they need them. Through the ages libraries are responding to various types of new technologies as means to package, organise, display, disseminate and deliver the information. At the end of 20th century, librarians and library patrons are increasingly familiar with electronic forms of materials including online reference books such as dictionaries, encyclopedias, periodical indexes, abstracts, and most recently full-text electronic journals. These materials were easily changed to electronic format and readily accepted by library patrons as convenient and appealing additions to the library collections (Barnard, 1999).

Only within the past two years e-books have become popular in libraries. This is largely attributed by the Internet revolution and evidently by the numerous e-book initiatives such as e-book hardware and software; PDAs; online e-book publishers; and online content providers including netLibrary, Books 24x7, Questia and ebrary. (Mullin, 2002 ; Connaway, 2003).

Based on the literature there are many libraries, especially in developed countries such as UK, US and New Zealand, which have utilised e-books not merely as a new method to deliver information digitally but present several alternatives to face the libraries challenges. As listed by Connaway (2003), libraries are facing several challenges in this millenium including limited budgets; limited shelving and space; reduced or no funding for additional space; new buildings and resources; rising cost to repair or replace damaged, lost and stolen books; users' dependence and demands for electronic resources; the rising costs of interlibrary loan service; and the demand to support distance or distributed learning and other remote user needs.

Moreover, the unique features of e-book offer various possibilities for libraries for expanding their services. As noted by McCarty (2001) a Humanities Reference and Instruction Librarian at the University of Colorado, Boulder: "E-books fulfill patrons' desire for immediacy...E-books answer the call from patrons of all disciplines for easier, immediate, more convenient access".

Other advantages of e-books for libraries include on-demand availability; prevention from being lost, stolen, or damaged; and ability to be linked to other additional resources of information (such as related web sites, graphics, sound, dictionaries and thesauri embedded in texts) (Ardito, 2000; Connaway, 2003).

Further, Grant (2002) indicated that provision of e-books in libraries would require no unpacking or processing, no shelving and reshelving, no physical circulation

(patrons perform shelf-checkout), no overdue or fine collection, no repair and no shelf required.

Moreover, use of e-books in libraries may speed up delivery to patrons, eliminate the extra time or money required to order, process, handle, and make books ready for circulation, never get lost and have any copyright issues taken care of by netLibrary. This is because the netLibrary e-books are not tied to one mode or standard for delivery. Moreover the netLibrary model is more like a library's, which allow librarians to control the circulation of an e-book to a patron (Helfer, 2000).

Alternatively for users, an e-book provides greater and faster availability and accessibility. As it can be downloaded or printed on demand from anywhere, regardless of time or place and users can read it immediately on PCs or on portable book readers (Ardito, 2000; Grant, 2002; and Snowhill, 2001).

As indicated by Snowhill (2001), features such as ease of browsing; navigating; keyword and full text searching within a book and across a collection of books; backlighting; changeable font size; mark-up text; citation creation; note taking; and support for different modes of reading enhance usability of e-books.

Grant (2002), also highlighted that an e-book allows readers to read in the dark on the backlit screen; view animated graphics or videos illustrating processes or techniques referred to in the text; carry many e-books all in one handheld device; and keep them current at less cost (provided publishers make cheap updates available).

Overall, e-books have various possibilities to improve the roles and services of the libraries to their users, no doubt provision and access of e-books is predicted to grow in libraries or information centers at the international and local level.

2.5 Costs

It is reported that the cost of e-books is affordable for most libraries' budget as e-books are currently selling for about 20% less than printed books. The cost is expected to drop even further as the cost savings for publishers and distributors are passed on the consumer (Rohde, 2001). However, it is necessary for a library to evaluate and justify the cost of e-book purchases and subscriptions if the library wishes to incorporate e-books in its collections since e-book vendors priced their databases differently.

Most e-book sellers or vendors have subscription pricing including consortium deals that greatly lower the cost to members. Ebrary, Oxford Reference Online and xreferPlus (excluding netLibrary Reference Collection) offer the subscription pricing (O'Leary, 2004).

As major database vendors have priced their databases as packages, rather than individual units, it results an overall saving to individual purchasers. For instance, it would have cost the 676 libraries participating in the TexShare database program over \$167,741,000 dollars to purchase the database subscriptions and e-book collection that were purchased by the Texas State Library and Archives Commission for under \$8,000,000. The database subscriptions, if purchased individually by each

library, would have cost these 676 libraries \$89,266,000. E-book collection, if purchased individually by each library, would have cost these libraries \$78,475,000 (TexShare, 2004).

For Ebrary, the retail cost of purchasing printed or e-book versions of Academic Complete database alone is currently more than \$580,500. As the subscription price is based on a library's type and size, ebrary offers multi-user access to these titles at just a fraction of this cost. For example, ebrary charges academic libraries just \$1.50 per Full-Time Equivalent (FTE) student for their database of more than 13,000 titles. Community and career colleges may subscribe for \$1.00 per FTE. Thus, a large academic library with FTE 10,000 could just spend \$15,000 for the ebrary's database. Further more, ebrary offers multi-year contracts and special pricing through consortia and regional networks (ebrary, 2004).

For Books24x7, subscriptions are offered for individuals or corporations and are available for all three collections: ITPro, BusinessPro and OfficeEssentials. For corporate subscriptions, costs are based on the collections chosen and the number of users per collection. Annual individual subscriptions are \$299 per user for the Yearly ITPro or the Yearly BusinessPro collections and \$49 per user for the Yearly OfficeEssentials collection (Levack, 2003).

Besides that, there are e-book services available for free to download such as via Project Gutenberg, Bartleby.com and the Internet Public Library. As e-books are

available virtually and stored in the library server, a library can save additional costs for shipping, physical space and replacement of damaged e-books.

2.6 Acceptance of E-books in Libraries

The shift toward e-books as a new format of electronic information resource in general provides additional services to libraries. However, information and research on the acceptance of e-books in libraries are still not widely known.

A research study related to the acceptance of e-books was carried out in February 2001 by the Ebook Task Force, among 15 large academic libraries known to be providing access to e-books and four University of California campuses with e-book projects. The findings reported that most institutions were still in the trial stage with e-books, with only one to two years' experience with e-books, and the institutions were still tentative about the development of future collections. All the institutions stated that acquisition of e-books had little or no impact on their purchase of titles in printed. Some commented that they felt the role of e-books was not to replace printed but to serve as a duplicate copy (Snowhill, 2001).

Lonsdale and Armstrong (2001) also addressed some of the issues that were central to the acceptance and integration of electronic scholarly monographs and textbooks (e-monographs) into the academic library. Based on three research projects in Great Britain, they suggested that almost casual use of terms like "digital library" and "hybrid library" belies the reality of slow acceptance of nearly all digital textual

resources other than journals, and a demonstrable lack of user take up of most kinds of electronic library-information resources.

The reasons for the slow acceptance might be related to the earlier finding, based on the focus group surveys among users of netLibrary in the Sun Shine Library, which is related to the purpose of use. As indicated by Helfer (2000), the users wanted to use e-books just as a reference tool because they wanted to search across the book, look deep into the content to get the answer they needed and then sent the book back. They could or would buy a physical copy of it if they wanted or need the book on an ongoing basis.

Similarly, a survey of netLibrary use among AMBS's (Associated Mennonite Biblical Seminary) users also reported that two out of four users who had negative impression of netLibrary indicated similar reasons, that they had looked at a book on netLibrary and then bought a printed copy. The other two indicated that they had checked out the site but had not actually read any books. The survey also revealed that out of thirteen replies, nine users who had a positive impression of netLibrary were those who had read all or part of books available on netLibrary purchased by AMBS's library (Saner, 2002).

2.7 Research on Usage of E-books

Lonsdale and Armstrong (2000) as cited in Sawyer (2001), stated that a preliminary review of the available literature revealed much recent hype, activity and comment but still little research, especially in the area of e-books use as opposed to journals.

In 2000, the Ebook Task Force had highlighted eight elements that they considered important to study the academic use of e-books. These included content; software and hardware standards and protocols; digital rights management; access; archiving and long term access; privacy; the market and pricing; and enhancements and ideal features (Snowhill, 2001).

To answer questions related to the above elements and usage of library services, Taylor (1986) as cited by Wei (2003) suggested that research on the delivery of electronic services should be user-oriented, since users are the best judges of service quality. One early study conducted by Wearden (1998) as cited by Sawyer (2001) was about the important features of a hypothetical e-book among the Kent State University's students. He revealed that the majority of respondents indicated, in decreasing order of importance features such as glossary lookup, bookmarking, highlighting and annotation in e-book systems.

Simon (2001) also conducted a similar study at Fordham College at Lincoln Center, Manhattan during the fall 1999, spring 2000 and summer 2000 semesters. This pilot study reported similar findings, which included: a majority of students used the glossary lookup (65%) and bookmarking (55%) features, while exactly half used highlighting and less than half (40%) used annotated content. Interestingly, all (100%) students noted that they would recommend using e-book in college to their friend and 95% of students indicated that they wished that more courses offered an e-book option. More importantly, 84% of the respondents indicated being willing to pay the \$200 for the Rocket eBook retail cost.

Over the Spring 2001 (January-May) semester, the University of Rochester Libraries, New York State, conducted two driven user studies regarding the use of netLibrary ebook titles. The first study was to examine the use of the overall netLibrary e-book collection and compared this to the use of the paper editions of the same titles. The findings indicated that only 29% (9 of 31) reported reading large portion of e-book titles. Most either browsed through one or more titles or searched for a single term across the collection. This corresponds with the general findings that most people are not comfortable reading large portions of text on a computer screen (Gibbon, 2001).

The second study focused on the use of e-books for course reserves. The findings indicated that 44% (16 of 36) reported reading material from the e-book version of their course reserves materials. Of those who did use the e-books, some reported some difficulties such as slow connectivity and titles always checked out. However, only four of the sixteen found it uncomfortable to read their course materials from computer screens. In spite of majority indicating a preference for paper books, a total of 25 out of 26 students believed the Libraries should continue to purchase e-books for use on the course reserve. Among the reasons explained by them were “it saves the students money”, “convenience”, “accessible online when the library is closed” and “do not require physical visit to the library” (Gibbon, 2001).

Snowhill (2001) reported that most institutions had no formal user feedback mechanism. Many noted that it was too early in the process to gather patron’s impressions. Those who did gather feedback noticed that users liked having online 24 hours and 7 days access. One institution conducted a survey of patrons checking out

reading devices and found that 81% said they would use the reader again and 78% said they had no difficulties operating the readers.

In the same year, a study conducted by Knowledge Systems & Research, Inc. for Andersen (2001) found that, 4 out of 10 Internet users were positive toward the concept of electronic books, with 25- to 29 year olds more likely than older users to be positive toward the concept. Interestingly, the findings revealed that more than 50% of respondents agreed that there were benefits to virtual page turning such as fast access and search capabilities in e-books. Other respondents perceived that no physical space requirements and portability of e-books on a computers as an advantage of e-books. The study surveyed nearly 1500 U.S online users to gauge their perceptions of electronic books.

In a survey of computer literate and regular readers carried out by Guthrie (2002) in August/September 2001, only 66 percent of respondents had ever heard of e-books. One respondent thought e-books were the books he ordered online from Amazon. Seventy percent of respondents said e-books could be useful. Thirty percent thought an e-book would not be any good for a novel, though none had tried reading e-books before.

The most recent study was carried out by Chu (2003) among 27 students at a library and information science schools in the USA in spring 2002, to find out what users and potential users think about e-books. She reported that only nine students had used e-books in the past. When the students were asked why they used the e-books,

many cited “Available around the clock”, “searchable” and “timely access to new titles” as the most important reasons.

In identifying the most heavily used e-book subjects, Dillon (2001) reported that based on the experience of University of Texas at Austin, e-book users differ slightly in subject interest, but e-books in the fields of economics and business, and computer science were receiving higher use than other subject areas, with medicine and health close behind.

However, there are limited information and studies on the purposes of using e-books among library users in the literature. In an article written by McCarty (2001), several trends in the use of and reaction to e-books were listed. Based on her personal observation in the University Colorado at Boulder Libraries, library users used e-books for research; convenience; searching; and sampling.

In identifying types of information used for research, teaching and learning, Healey (2002) revealed that only a small number of respondents used e-books. There were only 18% of respondents used e-books for research, 10% referred e-books for teaching and 20% used e-books for learning. In contrast, the highest percentage of respondents indicated preference for printed books, printed journals, online abstracts and indexes, printed abstracts and indexes and e-journals for purposes of research, teaching and learning. These findings were based on her in-depth interviews with 3,200 faculty members, undergraduates, and graduates students from small liberal arts colleges, public and private research institutions in America.

Wei (2003) indicated that undergraduates and academic staff had different purposes for using information services based on their information needs. Moreover, different user communities had different perception on the importance and usefulness of these services. These findings were based on her study on perceptions and expectations of users and librarians on digital services at Victoria University of Wellington, New Zealand. The digital services included in the study were OPAC, database, e-journal, e-mail reference, other selected Internet resources and online request forms.

2.8 Reasons for Non Use

Based on the literature, there are several reasons why e-books usage among users did not take off until recently. Perhaps, the biggest obstacle to accepting e-books is the conviction of most readers that there is nothing wrong with old-fashionable books and most people are not comfortable with the idea of portable reading (reading a novel using a laptop or PalmPilot). Moreover, the high-price for both the hardware and software for digital versions of books, only allowed selected individuals or libraries to sign up for the service (Helfer, 2000).

Andersen (2001) investigated another issue that prevents the ease use of e-books. The report indicated that the need to purchase e-book readers or e-book reader software as the main drawbacks of electronic books. As commented by more than 60% users, they need to own more than one e-book readers because of multi-formats and need to read an e-book via e-book reader devices.

Some researchers also reported that many respondents indicated difficulties in reading e-book because of small screen and other problems including frequent browser crashes, slow load times, copyright violation notices appearing at inappropriate times and difficulties in navigating through text (Andersen, 2001; Gibbon, 2001).

Moreover, the reading devices, be it a computer or a handheld device, are relatively expensive and have several limitations inherent in them. For instance, desktop computers are not portable; notebooks are expensive, have limited battery life; handhelds on the other hand have small, hard to read screens and limited ability to display graphics or handle multimedia features such as audio or video; and none of them is cheap. (Grant, 2002). Similarly, Chu (2003) also identified factors such as “hard to read and browse, “need special equipment”, “additional cost on the user’s site” and “not enough thought or exposure” as the most important reasons for not using the e-books.

In investigating the factors that discourage users to use e-books, it would be also useful to study the factors that have been previously reported as deterrent to the use of electronic journals. For instance, Holmquist (1997) in a survey on the use of electronic journals at the Princeton University Library, USA, reported that the main reasons given by 60% of the respondents for not using e-journals was that they preferred to read printed on paper, not on the computer screen. The next most frequently given reason, was simply that they have not had the time to learn about

electronic journals and others said they preferred paper journals, not electronic, for browsing.

2.9 User Preference: E-book or Printed

The issue of user preference between the electronic and printed format remains an important topic in studying the usage of any electronic materials including the e-books.

Messing (1995) did an early study on the use of web-based books as teaching materials in distance education courses. He stressed the importance of looking at the use of these materials from the users' perspective; and comments on the difficulties in measuring how, and determining reasons, students use such systems. Regarding the critical issue of readability from computer screens, the studies indicated that this is to be determined by personal preference. Some students clearly prefer to read from paper and print out.

Columbia University ran an Online Books Project from 1995-1999, to analyse the user community's adoption of, and reaction to, various on-line books and delivery system features. Summerfield and Mandel (1999), as noted in Sawyer (2001), indicated that students with a major course text available in the online collection used e-books in some depth. The project also compared the use of a particular book that was both in print and online format. The results suggest only minority of students used the online version. Similar to Messing's study, these researchers found that willingness to read online for extended periods varied from person to person.

Ray and Day (1998) investigated user attitudes towards electronic information resources. They found that many respondents did use some electronic resources and were aware of their benefits, but the majority still liked to use printed materials. The most popular electronic resources were the Internet and CD-ROM, however, the analysis of the results indicated that there were differences dependent upon the subject studied. For instance, 100% of respondents studying computer studies used both CD-ROMs and the Internet, however only 47.6% of students studying education used the Internet.

Similarly, the Seybold's Industry survey on e-books (2000) also reported that the majority of publishing professionals did not believe that printed would go away anytime soon. Sixty-four percent respondents disagreed with the statement that within 20 years, books, newspapers and periodicals would only be available electronically. Only eleven percent agreed with the statement.

Gibbon (2001) in her report on the usage of netLibrary at the University of Rochester Libraries in New York, also revealed that many students preferred their course reserve material in paper format compared to e-book format. Reasons for the paper preference included having personal copy for quick reference; not as harsh on the eyes; does not require ownership of a computer and Internet connection; and could highlight and annotate the text.

Those reasons corresponded to those reported earlier by McKnight (1997) on the user attitudes and behavior towards electronic journals. He stated that people did not like

reading from screens due to the issue of computer screen resolution and they preferred to print out articles for reading. Moreover, they liked to annotate print or photocopied articles. Although annotating electronic articles is certainly possible but it required users to learn some additional skills. Although the study focused solely on the use of e-journal and not related directly to the use of e-books, the results were useful and essential when discussing different opinion held by these populations.

A research study into reading appliances at Palo Alto, California in the late 1990s also concluded similar findings that people prefer reading on paper to reading on screen as paper being easier and more comfortable to use than portable computers. Moreover, no matter how paper like reading devices are, electronic books and documents readers are unlikely to replace paper or even desktop computers (Guthrie, 2002).

A recent study carried out by McKnight and Dearnley (2003) on the use of electronic books in a public library in UK, also correlated with previous researches, notably a preference for paper books from patrons. Thus, no doubt traditional paper books will be published for many years and be a preference for many of us. As highlighted by Cawkell (1999), “A screen cannot compete with printed pages in terms of ease of annotation, portability, convenience, quality, colour, aesthetics, immediate availability of large chunks...”.

2.9.1 User Preference for Reading Reference Books: E-book or Printed

In contrast, many studies revealed clear preference for electronic format in discussing the issue of user preference between the electronic and print format for reading

reference materials. This is undeniably true, as the general purpose of some types of books including encyclopedias, reference books, textbooks and instruction manuals are to provide easily retrievable information. Therefore, methods of retrieval from stored text can be applied to electronic books (Rao, 2003).

For instance, in identifying the types of e-books and electronic publications that the publishing professionals would be interested in reading regularly on various reading devices, the Seybold's Industry survey on e-books (2000) reported that 66 percent of the respondents were most interested in reading reference materials, maps or travel guides (65 percent) and product information (64 percent) on desktop or laptop computers.

Similarly, in a sample survey of UK consumers carried out in the latter part of 2001, the majority of the consumers also preferred education and reference as the best uses for e-books and e-readers (Guthrie, 2002). The same scenario were described by W.Lewis, Dean of the University Library at Indiana University-Purdue University Indianapolis and Roberto Esteves, chief information and resource management at the San Francisco Public Library. Based on their experience readers use e-books as reference sources, looking for a particular piece of information rather than reading for cover to cover (Long, 2003).

A study sponsored by electronic publisher Versaware Inc. between October 23 and November 17, 2000 shows that electronic texts are making strides in America's colleges. A respectable 62 percent of 100 students asserted that they prefer digitized

texts over standard paper volumes. Among the “very important” factors listed by the students in selecting e-texts over printed, included the ability to search and integrate information instantly on the web (75 percent); obtaining updates as publishers provide them (73 percent); to avoid carrying heavy textbooks (72 percent); the ability to perform customized searches in one book or collections of books and papers (71 percent); the ability to organize research in personally labeled binders (71 percent); and the ability to highlight text (71 percent) (Rogers, 2001).

A related study on the comparison of electronic and printed journals in the University of Patras, Greek also reported the similar results. More than two-thirds of the subjects (65.5 percent) considered the electronic version as the most favourable method of reading a journal title. The most cited reasons indicated by them were easy to use; quick access; easy to search and data can be saved, manipulated and printed out (Monopoli...et al, 2002).

2.10 Conclusion

Based on review of literature related to the research problem, it can be concluded that research on the usage of e-books have been explored in developed countries around the world. However, this topic has yet to be undertaken in Malaysia. Therefore, this research is designed specifically to close the gap and provide relevant information on the use of e-books among undergraduates at University of Malaya, Kuala Lumpur.

The relevant literature reviewed in this chapter indicated that there are various definitions for the term ‘electronic book’ or ‘e-book’ as people perceive and

understand e-book differently (Abrew, 2001; Lynch, 2001; Ormes. 2001; Grant, 2002; and Connaway, 2003). Therefore, it is essential to investigate in this study, how students perceive the e-book based on their understanding.

Furthermore, many related studies reported a slow acceptance of e-books in libraries and among the libraries' users (Helfer 2000; Lonsdale and Armstrong, 2001; and Snowhill, 2001). Moreover, many studies on usage of e-books focused on investigating the features of e-books that the users valued most and giving little emphasis on how, where, when, hours spent and purposes of using the e-books (Warden, 1998; Anderson, 2001; Simon, 2001; and Chu, 2003). Therefore, there is necessary to replicate the study at the local setting and investigate further on the usage pattern of e-books and factors effecting e-book use.

In investigating the issue of user preference between the electronic and print format for reading a textbooks, many studies indicated clear preference for print format (McKnight, 1997; Ray and Day, 1998; Gibbon, 2001; Guthrie, 2002; McKnight and Dearnley, 2003). In contrast, many studies revealed a higher preference for electronic format in reading reference materials (Rogers, 2001; Monopoli...et al, 2002; Long, 2003; and Rao, 2003). Therefore, it is important to include the issues in this study, as the issues remain an important topic in studying the usage of e-books and compare the results of other studies with this study.

Overall, the review of other studies reported in this chapter help the researcher to provide an understanding of the existing problems, issues and a conceptual basis for

formulating the research questions, research designs and data analysis procedures for this study. The variables studied and the relationships between the variables reported in the previous research results also provide the basic for formulating the questionnaire. For instance, based on the available literature, many user-oriented studies on the usage of e-books were conducted among the colleges and universities students. Thus, indicate that undergraduates are ideal targeted respondents for this study. All in all, this literature review may also helps readers to understand the rationale and need for conducting this study.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

This chapter discusses the research design and methodology used in the study. The research design section presents a discussion on the process and procedures of the study. The process includes selection of the population, the design of the research instrument, the pilot test, the data collection procedure and the methods use to analyse data.

3.1 Student's E-book Usage Situations

This study aims to identify the perception and usage pattern of electronic books among Information Technology (IT) students. It focuses on identifying the places and situations where students access e-books, their reasons for use and non-use, and their preference of using an e-book to printed book. The study utilises a descriptive survey method and employs the questionnaire as the data collection instrument. Figure 3.1 indicates the student's e-book usage situations. This general model is based on the reviews of relevant research literature on the use of e-books.

i) The Student

The student as a user of e-books is placed in the center of various factors, indicating their usage of e-books may be related to the several identified situations. The four components are technology competencies, cognitive factors, access factors and functional factors. Each component contains a number of variables that are described

with examples from the literature. Existing studies related to usage of library services suggest that research on the delivery of electronic services should be user-oriented, since users are the best judges of service quality (Taylor, 1986 in Wei, 2003). Thus, the main feature of this model is designed to provide a general insight on how a user uses e-books. The student is an ideal targeted user of e-books since many user-oriented studies on the usage of e-books are conducted among the colleges and universities students (Wearden, 1998; Dillon, 2001; Gibbon, 2001; McCarty, 2001; Simon, 2001; and Chu, 2003).

Generally, the usage of e-books are measured in terms of affirmation of use, hours spent on use, frequency of use, subject most use, purpose and percentage of e-book use as reference. Studies on use of e-books indicate a slow acceptance of e-books in libraries and among the library users. For example, study on acceptance of electronic scholarly monographs and textbooks into the academic library, Lonsdale and Armstrong (2001) found that only a small minority of users took up most kinds of electronic library-information resources.

With respect to frequency, Monopoli...et. al. (2002) noted that there is relationship between the differences in frequency of e-journals use and gender. He discovered that more males used e-journals service on a daily, weekly or monthly basis than females. Regarding the subject of e-book most used by students, Dillon (2001) revealed that Computer Science and Information Technology, Health and Medicine and Economics and Business received higher usage than other subject areas.

Drawn from the literature, there are limited studies conducted on the purposes of using e-books among library users. Based on personal observation in the University

Colorado at Boulder Libraries by McCarty (2001) found that library users used e-books for research, convenience, searching and sampling. Wei (2003) studied on the use of library electronic services indicated that undergraduates and academic staff had different purposes for using information services based on their information needs. However, there is no study attempts to investigate the percentage of e-book data use or cite by students in writing their assignments or research projects.

Perhaps, by understanding how, when and why student uses e-books, it will help information and service providers decide which types and titles of e-books that is most suitable to their users' information needs. However, the way in which student uses e-books is also influenced by other important factors such as follows,

a) Technology Competencies

Generally, technology competencies such as knowledge and skills in using basic computers and Internet applications are essential in using electronic resources and services. Similarly, user of e-books may also be influenced by factors relating to the IT competency as years of using computers, computer skills (such as ability in using word processing, desktop publishing, e-mail and locating and retrieving information via Internet), years of using Internet and hours of using Internet per week.

This is because the user of e-books needs to possess certain skills for locating and retrieving information within a book and across a collection of books and handling reading devices like Rocket e-book, Softbook, PDAs and Palm pilots. Therefore, it is generally assumed that IT related students who are competent in using computers and Internet are more likely to use e-books services compared to Art students. Ray and Day (1998) reported that analysis of user attitudes towards the use

of electronic information resources indicated that there were differences dependent upon the subject studied. For example, the majority of respondents studying computer studies used both CD-ROMs and Internet, however only minority of students studying education used the Internet.

Moreover, it is assumed that heavy Internet users are among the e-book users as they spend longer hours on using the Internet. As reported by Knowledge Systems & Research, Inc. for Andersen (2001) 60% of Internet users were positive toward the concept of electronic books.

b) Cognitive Factors

Cognitive factors refer to student's knowledge, perception, impression and attitude toward e-books. It should be noted that user's perception on what is 'e-book' might have an effect on the use of the service. This is because there are several types and formats of e-books available for users in the market. Moreover, there is no standard definition of e-book, thus, researchers in the literature define e-books differently. Some researchers define e-book as content of e-book, others refer it solely on hardware or software use to read the e-book and some have included both the information content of e-book and electronic reader (e-reader). For example, in a survey of computer literate and regular readers carried out by Guthrie (2002), only 66 percent of respondents had never heard of e-books. One respondent thought e-books were the books he ordered online from Amazon. Therefore, a clear picture of what is actually an e-book is important in attracting user to use e-book.

It should be noted that user reactions toward e-book services and awareness of a library service might have an effect on the uses of the service. This is because

different user communities have different perception on the importance and usefulness of these services. A study has shown that users' perceive importance of the service, their satisfaction with the services, and their familiarity with the library and its resources influence the level of use. Thus, the more important the service is perceived, the more likely it is that users will use this service in the future (Wei, 2003). Marketing is therefore vital, as everybody should be made aware of the e-books service and develop an awareness of how the e-books can be accessed and used.

c) Access Factors

Access factors are very importance influence that actually answers a number of questions pertaining to how, where and why users access e-books. Access factors can refer to the means or gateways users prefer to access the e-books and places where users conduct their searches on the e-books service. For instance, users might prefer to access e-books through library web site or any free web or homepages available via the Internet. Faculty's computer labs, library's computer labs, homes or cyber cafes can also represent the places of access.

Research has shown that users are likely to access and use e-books if they have availability values. Chu (2003) found that users use e-books for variety of factors such as "available around the clock", "searchable" and "timely access to new titles". Therefore, it is not surprising that a study has shown that students considered digital libraries were very convenient since they did not need to go to libraries and could still read and download books or journals from home (Bodomo...et al, 2003).

d) Functional Factors

Functional factors are the fourth influence that users consider when using e-books. Functional factors can be prevalent influence, especially when users need information that practical and useful for them. Based on the review of the literature, some of the most importance variables in this regard were found to be easy to use or search, easy access from computer screen, convenient, user friendly, easy to cut and paste, cost effectiveness and preferred format for reading.

Research has shown that users are likely to consult e-book for information if the e-book is easy to use, save space, have helpful features, easy to navigate and download (Chu, 2003). In contrast, users are not encouraged to use e-books service if e-books are difficult to read and browse, need special equipments, need additional cost on the user's site and require additional skills to access or use e-books (Chu, 2003).

Preference of format for reading a textbook and reference book also has a very important influence on the use of e-books. Although, the issue of readability from computer screens is to be determined by personal preference (Messing, 1995). But many researches have shown that people prefer reading a full text on paper than on computer screen (Gibbon, 2001; Guthrie, 2002; and McKnight and Dearnley, 2003). Studies investigating on users' favourite method for reading an e-book revealed that most people are not comfortable reading large portions of text on a computer screen (McKnight, 1997; Gibbon, 2001; and Guthrie, 2002). In contrast, many of them prefer to read reference materials electronically (Guthrie, 2002; and Long, 2003). Thus, it is worth to study on the users' preference of format for reading, as it will

help information and service providers to decide which types of books and e-books that are convenient for their users.

Finally, it should be pointed out that student use of e-book is greatly influenced by a number of interacting variables. Furthermore, the factors discussed in this section are not static but continually related to each other. Hopefully, information on the factors effecting on e-books use may help information and service providers to have an insight about pattern of e-books uses, users information needs and their information seeking behavior which may help them to satisfy the diverse users information needs at the right time, place and means. Ultimately, it is hoped that this model will help them to evaluate and measure the effectiveness of the service in order to justify decisions on the provision of e-books, which is costly.

3.2 Type of Study

This is an exploratory study which ventures into a new area of research and can increase the researcher's familiarity with the phenomenon in questions (Powell, 1994). The University of Malaya (UML) is currently providing access to e-book service via the UML web site. This service was incorporated into the UML online resources since 2001 and was aimed at improving the quantity and quality of services for the patrons. As patrons need for fast and easy access of information anywhere and anytime at their fingertips. However, there have been no formal studies conducted on the use of e-books at the UML. The researcher's interest in the field of e-books and the curiosity on the actual usage pattern of e-books among the UML users had prompted this study.

3.3 Unit of Analysis

Although all UML users including undergraduates, postgraduates, academic staff, managerial staff and support staff are targeted users of e-book services provided via the UML web site, the study has focused only on IT undergraduates in the University of Malaya (UM). The undergraduates from the Faculty of Computer Science and Information Technology (FCSIT) are chosen for the study due to the fact that they have better exposure to current IT applications and are assumed to be computer literate. It is also assumed that the IT students are more likely to use e-books because of the amount of time they spend on using the Internet and their need for fast and easy access for large amount of information. Moreover, the undergraduates have attended the 1 credit Information Skills course conducted by the University Library that exposes them to the basic information skills, such as how to use the variety of services available at the UML. Therefore, the study on the perception and use of e-books among IT related undergraduates would provide valuable insights into the effectiveness of the current e-book services provided at the UML.

3.4 Research Design

Research design is a term that refers to a plan for selecting subjects, research sites and data collection procedures to answer the research questions (McMillan and Schumacher, 1989). The design indicates which individuals (subjects) will be studied, when, where and how they will be studied.

This study uses the survey research methods. The method facilitates the collection of information from a large number of respondents (population) based on

the responses of a smaller group of subjects selected from the population. This study investigates twelve research questions related to the use of e-books among IT undergraduates, which are outlined in the Chapter One.

3.4.1 Population and Selection of Sample

Since it is generally impossible to study the entire population (all undergraduates in the FCSIT), the researcher relies on sampling technique to acquire a section of the population to perform this study.

The population of students is obtained from the Annual Report 2002/2003, published by the Faculty of Computer Science and Information Technology (FCSIT), University of Malaya. There are two undergraduate degree programmes, the Bachelor of Computer Science (BCS) and the Bachelor of Information Technology (BIT) offered by the Faculty since its inception in 1994. The programmes comprise three years, which is normally followed within six semesters. However, this study is confined to undergraduates in the second, third, fourth and fifth semester only. This is because these students have attended the Information Skill course, which is offered in every second semester for the first year students.

There are approximately 1554 undergraduates studying in the second, third, fourth and fifth semesters for the academic year 2002/2003. From this number, 969 students enrolled in the Bachelor of Computer Science programme and the remaining 585 students enrolled in the Bachelor of Information Technology programme. The total number of students for each programme and semester are presented in Table 3.1.

Table 3.1: Total Number of Undergraduates by Programme and Semester (2002/2003).

Programme	Semester					Grand Total
	II	III	IV	V	VI	
Computer Science	140	176	186	237	230	969
Information Technology	91	98	93	150	153	585
Total	231	274	279	387	383	1554

The sample size was determined by using a published table which provide a sample size (n) for a given combinations of precision, confidence levels and variability. It does not require any calculations. Yamane (1967) suggested that for the population size between 1000-2000, the sample size for $\pm 7\%$ precision levels where confidence level is 95% and P=5. (maximum variability) is between 169-185. The sample size reflects the number of responses that need to be obtained.

This study adopted the stratified random sampling method to obtain equal number of students from each programmes. In this procedure, the population (all undergraduates in the FCSIT) was stratified by the programmes; the Bachelor of Computer Science (BCS) and the Bachelor of Information Technology (BIT). Next, the sample was further divided into subgroups on the basis of Semester II, III, Semester IV and Semester V. Finally, only 50 students were selected from each semesters based on an accidental sampling technique. A total of 250 questionnaires were distributed at the FCSIT, whereby the researcher simply selected the students as they entered the classrooms, computer labs, document room, foyers or canteen on a “first-come, first

served” basis. The researcher aimed to collect 180 questionnaires with ten percent allowance for non-returned and spoilt questionnaires.

3.4.2 Survey Instrument

The data in the study was collected using a questionnaire. This technique was used, as it is relatively economical. Moreover, it helps the researcher to standardise the questions, assure anonymity and questions can be designed for specific purposes.

The questions were designed following the same format and presented in the form of;

- i) Open and closed form;
- ii) Dichotomous response questions (Yes/No response); and
- iii) Likert Scale.

The questions in the questionnaire were specifically designed to collect information on:

- a) Student’s Demographic and Technology Competencies.
- b) Student’s Use of E-books
- c) Cognitive Factors
- d) Access Factors
- e) Functional Factors

The questions were arranged in five sections;

- a) Part A: Student’s Demographic Section
- b) Part B: Student’s Perception Towards Electronic Books
- c) Part C: Reasons for Non-Use
- d) Part D: Student’s Preference of E-book vs Printed book

Part A : Student's Demographic Section

Part A contains ten questions providing student's demographic information and their technology competencies in using computers and Internet. In this section, information on gender, age, race, parent's occupations, geographic background, name of programme, semester and the academic year that respondent are currently pursuing are obtained to provide general background of the students. Question 7 investigates the number of years students have used computers before entering the university. Using Likert Scales, ranging from 'Excellent' to 'Uncertain', Question eight determines the students' ability in using several computer-related functions including word processing, e-mail and programming. Question 9 investigates the number of years students have been using the Internet. In question 10, students were asked on hours a week they spend online accessing the Internet per week.

Part B : Student's Perception Towards Electronic Books

Part B identifies several cognitive factors that may influence students to use e-books such as their perception of e-books and the reaction towards the importance of e-book services at the University of Malaya Library (UML). Students are asked about their familiarity with the term "Electronic book" (Henke, 2003), the sources of information from which students first learned about e-book, and how students perceive an electronic book based on their understanding. The definition of an e-book has been regarded as an important issue since there is no standard definition for it. (Abrew, 2001; Lynch, 2001; Ormes, 2002; Goh, 2002; Grant, 2002; Connaway, 2003). Using Likert Scales, ranging from very negative to very positive, Question 13 is created to determine the students' reaction towards the e-book services at the

UML. Question 14 is open- ended and aims to inquire why students have such reaction towards the services. This is because information on the acceptance of e-books among library users are still not widely known as there are only few studies concentrated on this topic (Helfer, 2000).

Part C : Use of Electronic Books

Part C deals with the use of electronic books. Using dichotomous response questions, Question 15 investigates whether the students have used the e-books prior to the survey. Various statements and phrases are given in Question 16 through Question 26, to assist students to mark those responses that they consider appropriate by them. These questions sought to identify the access and functional factors of e-books use among the students in term of where, when, what and why they use e-books. In Question 21, students are presented with 4 subjects- General; Health and Medicine; Economics and Business; Computer Science and Information Technology and other subjects. The 3 subjects - Computer Science and Information Technology; Health and Medicine and Economics and Business were mentioned by Dillon (2001) as the areas that e-books receive higher use than other subject areas.

Question 22 of the questionnaire explores respondents' primary purpose of using e-books. Four purposes are presented which includes research, reference, pleasure reading, browsing and other purposes. McCarty (2001) reports that based on her observation in the University Colorado at Boulder Libraries, library users use e-books primarily for research, whereas Guthrie (2002) indicated that users use e-books for reference and leisure reading.

Question 24 inquires information on the percentage of e-book data the students include in their research, bibliographies, projects or assignments. Question 24 in this part determines the reasons for using e-books. This question was also asked by Chu (2003) in her survey *'Electronic books: view points from users and potential users'*. Question 25 investigates how students read their e-books. The information collected would provide indicators on the students' preference of reading an e-book via the computer screen or the printed paper. Question 26 determines the students willingness to recommend using an e-book to their colleagues or friends.

Part D : Reasons for Non-Usage

This section investigates students' responses for not using e-books. The question was designed based on the instrument used by Chu (2003) to determine what factors that discourage students from using e-books. Respondents were also asked their willingness to use e-books in the future.

Part E : Student's Preference of E-book vs Printed book

Part E contains four questions, which identify the students' preference between e-books and printed books. Questions 29 and 30 are designed based on the instrument, which Khalil and Raja (2001) used for their e-book usage survey. The users' preferences between the electronic and printed format remain an important topic in studying the usage of e-books (Messing, 1995; McKnight, 1997; Ray & Day, 1998; Sawyer, 2001; Gibbon, 2001; Khalil & Raja, 2001). Question 31 determines the students' opinions on the status of the traditional printed books and the

electronic books. Whereas, Question 32 explores suggestions by students on how staff and librarians can improve the quality of e-book services at the UML.

3.4.3 Pilot Test

A pilot test was conducted on February 9, 2004 to ascertain the clarity of the instrument. The questionnaire was tested on ten undergraduates from the Faculty of Computer Science and Information Technology. The students were chosen based on their willingness to participate in the test. The volunteers were encouraged to ask, give comments and suggestions on unclear items so that any weaknesses could be eliminated. It was found that the volunteers encountered no difficulty in answering the questionnaire.

3.5 Data Collection

The data collection process commenced in the middle of February 2004 till early of March 2004. Each of the questionnaires was accompanied by a cover letter, designed to explain the purpose of the study, the techniques used to select the students and to stress the importance of each student's responding.

The researcher personally visited the faculty and distributed the questionnaires during the ten days of the survey. Through personal administration the researcher had personal contact with the students, thus encouraged students to complete and return the questionnaires. The questionnaires were distributed and collected on the same days of the survey.

3.6 Data Analysis

The data collected were interpreted, classified and numerically coded. Analysis was done using Statistical Package for Social Science (SPSS) Version 11.0 for Windows. Out of the 250 questionnaires distributed and 206 completed questionnaires were returned, giving a high response rate of 82.4% and a corresponding non-response rate of 17.6%. Although, a high number of questionnaires were collected, some questions were left blank or unanswered. However, these were coded as “no answer” and treated as a valid data. Therefore, the actual total number of students would be corresponded with the sample size.

In the analysis of data, the procedure employed is related to the research questions presented in Chapter One. The programs were run to obtain frequencies, percentages and chi-square for the selected variables and responses to make generalisation of the findings. Cross tabulation procedures were used to study the relationship between two or more variables such as gender. The procedure is useful to determine the characteristic of the e-books users and non-users. The analysed data was then synthesised and presented in descriptive form, tables and figures.

3.7 Summary

This chapter presents the research methodology adopted in this research. First the sampling design was described. Next, it presents how the data collection instrument is developed together with a brief outline of the items used in the instrument. It also includes how the pilot test was done, how the questionnaires were distributed and collected, as well as how the data was analysed. The analysis and findings of research were presented in the next chapter in the narrative and statistical analysis using frequency tables, pie charts and bar charts.

CHAPTER FOUR

RESULTS OF DATA ANALYSIS

4.1 Introduction

The main aim of the study is to identify the possible factors that might be related to students' use of electronic books (e-books) at the University of Malaya Library (UML). The usage pattern of e-books among undergraduate students, their reasons for usage and non-usage and their preference of e-book to print book are also studied. In this section, the results of the study will be reported. First, the background information and profile of the students are described. Then, findings related to the study's research questions are presented using descriptive statistics.

4.2 Profile of Students

The background information and profile of the students are requested using Part A (Student's demographic section) of the questionnaire. The following section presents the information collected.

4.2.1 Gender and Race

Questions 1 and 2 are designed to identify the students' gender and race. Table 4.1 shows the cross tabulation of gender and race of the students. The data displays that 43 (20.9%) students are Malay males and 70 (34.0%) are Malay females. The Chinese students comprise 38 (18.4%) males and 26 (12.6%) females. A total of 12 (5.8%) students are Indian males and 15 (7.3%) Indian females. However, 2 (1.0%) students do not reveal their race. Thus, the sample has a total of 94 (45.6%) male students and 112 (54.4%) female students.

Table 4.1: Students' Race and Gender (n=206).

Race	Gender		Total
	Male	Female	
Malay	43 20.9%	70 34.0%	113 54.9%
Chinese	38 18.4%	26 12.6%	64 31.1%
Indian	12 5.8%	15 7.3%	27 13.1%
No answer	1 0.5%	1 0.5%	2 1.0%
Total	94 45.6%	112 54.4%	206 100.0%

4.2.2 Parents' Occupations

Question 3 investigates data on the occupations of the students' parents. Table 4.2 indicates that, the majority of the students' (144 or 69.9%) mothers are housewives, 26 (12.6%) are managerial or professional staff, 17 (8.3%) students' mothers are retired and 12 (5.8%) of the students' mothers are businesswomen. Six (2.9%) of the students answer 'Other'. The answers given by them are "farmer" and "passed away". Only 1 (0.5%) student does not indicate his mother's occupation.

Table 4.3 presents information about the father's occupation of the students. As can be seen from the table, 71(34.5%) students' fathers are retired. Only a very small number (3 or 1.5%) of the students' fathers are unemployed. Fifty-three (25.7%) of the students' fathers are self-employed or businessmen, 45 (21.8%) of the students' fathers have managerial or professional posts and 23 (11.2%) of the

students check ‘Other’, the answers given by them for this option are “security guards”, “laborers”, “farmer”, “fishermen”, “technicians”, “drivers” or “passed away”. However, eleven (5.3%) students do not answer this question.

Table 4.2: Mother's Occupation (n=206)

Occupation	Count	%
Housewife	144	69.9
Managerial/Professional	26	12.6
Retired	17	8.3
Self employed/Businesswoman	12	5.8
Other	6	2.9
No answer	1	0.5
Total	206	100.0

Table 4.3: Father's Occupation (n=206)

Occupation	Count	%
Retired	71	34.5
Self employed/Businessman	53	25.7
Managerial/Professional	45	21.8
Other	23	11.2
Unemployed	3	1.5
No answer	11	5.3
Total	206	100.0

From the data, it can be concluded that the students are drawn from the various social background including the lower, middle and upper classes. Therefore, it can be generally assumed that students from the middle and higher income families could afford to own computers or receive better exposure to computers than students from the lower income families.

4.2.3 Students' Geographic Background

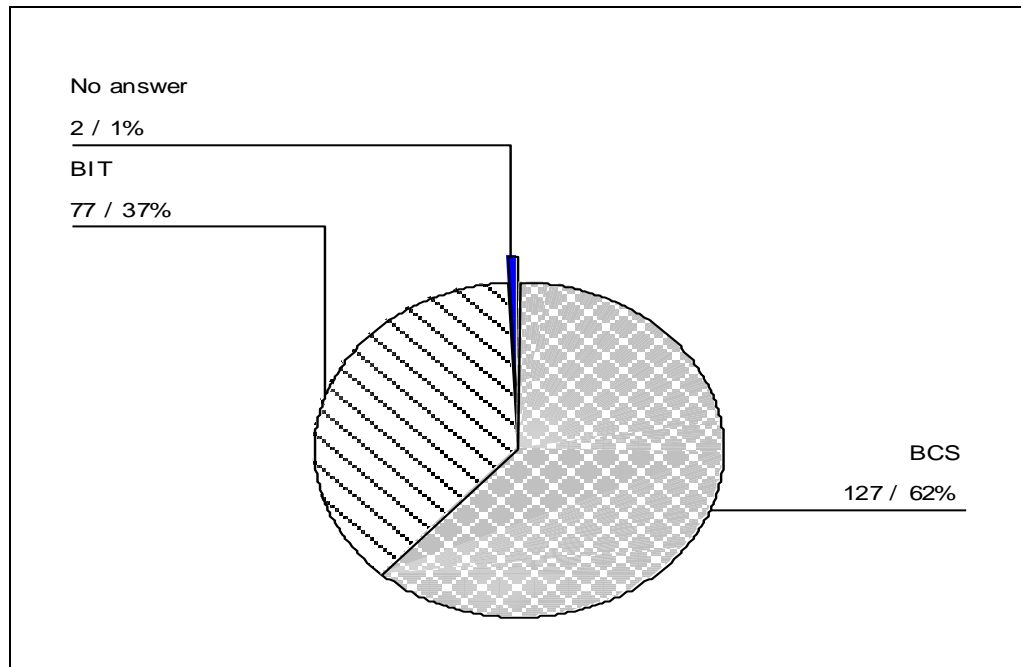
Information on the students' geographic background is acquired via the Question 4. Table 4.4 shows the breakdown of areas of the students' geographic background. Most of the students are from the suburb areas (88 or 42.7%). The suburb is a residential area near a city such as Gombak, Selayang and Kajang. This is followed by those from urban areas (62 or 30.1%). Urban, on the other hand refers to an area that is located at the center of a city such as Kuala Lumpur, Petaling Jaya and Subang Jaya. A total of 50 (24.3%) students indicate that they live in the areas that are located outside the city and suburb areas (rural areas). However, four (1.9%) of the students are uncertain about their geographic background and 2 (1.0%) do not answer the question.

The result shows that there are 70% of students in the sample are from suburb and rural areas. This is expected to put them in a more conducive environment so that they are more receptive to information and technology related activities.

Table 4.4: Students' Geographic Background (N=260)

Area	Count	%
Suburb	88	42.7
Urban	62	30.1
Rural	50	24.3
Uncertain	4	1.9
No answer	2	1.0
Total	206	100.0

Figure 1: Course of Study (n=206)



*BIT=Bachelor of Information Technology; *BCS=Bachelor of Computer Science

4.2.4 Course, Semester and Year of Study

Questions 5 and 6 are designed to verify data on the name of the programme, semester and year of study among students. Figure 4.1 indicates that, 127 (62.0%) students are currently pursuing the Bachelor of Computer Science (BCS) and 77 (37%) of them enrolled for the Bachelor of Information Technology (BIT). Only 2 out of 206 or 1.0% students do not respond to this question.

The composition of semester and year of study of students is summarised in Table 5. The data shows that 44 (21.4%) students are in the second semester, 32 (15.5%) are in the third semester, 42 (20.4%) students are respectively in the fourth and sixth semester and 41(19.9%) are in their fifth semester. Only a very small number, that is five (2.4%) students do not indicate their semester and year of study.

Table 4.5 also indicates that 85 (41.5%) students are in the third year of their study programme. This is followed by 75 (36.4%) students in the second year and first year (44 or 21.4%). Thus, from the data it can be concluded that the students selected in the study are representative of the semesters two, three, four, five and six.

Table 4.5: Semester and Year of Study (N-206)

SEMESTER		YEAR				Total
		I	II	III	No answer	
2	Count %	44 21.4%				44 21.4%
3	Count %		32 15.5%			32 15.5%
4	Count %		42 20.4%			42 20.4%
5	Count %			41 19.9%		41 19.9%
6	Count %			42 20.4%		42 20.4%
No answer	Count %		1 .5%	2 1.0%	2 1.0%	5 2.4%
Total	Count %	44 21.4%	75 36.4%	85 41.3%	2 1.0%	206 100.0%

4.3 Factors Related to E-book Use

The way in which student uses e-books is influenced by many factors. Below are the possible factors that might be related to students' use of e-books.

4.3.1 Technology Competency

Information on the technology competency among students is obtained through Questions 7, 8, 9 and 10. The gauge uses are the students' use of computer and Internet.

(a) Use of Computer

Question 7 investigates on how many year(s) students have used the computers before entering the university. Figure 4.2 indicates that most of the students 89 (43.2%) use the computers for one to two years.

Figure 4.2: Number of Years Students Use the Computers (n=206).

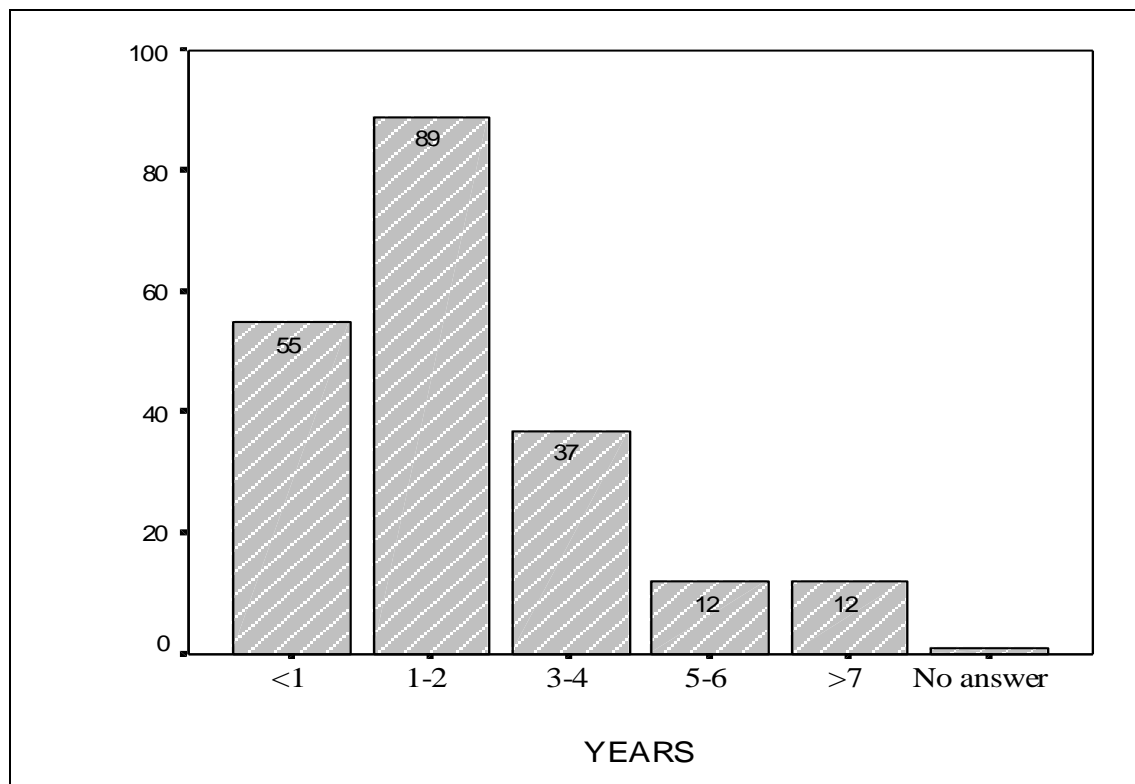


Table 4.6 shows that almost equal percentage of male students (24.5%) and female students (28.6%) use the computers for one to two years. A total of 55 (26.7%) of the students check “less than a year”, they are among 32 (28.6%) female students and 23 (24.5%) male students. However, 37 (18.0%) students check “3-4 years”. Only 12 (5.8%) use the computers for five to six years and among them 10 (8.9%) are female students. Another twelve (5.8%) students also indicate that they use the computers for more than seven years. However, there are more male students (8 or 8.5%) who

indicate using the computers for more than 7 years than female students (4 or 3.6%). Only one (0.5%) student does not answer the question and the data affirm that the students are exposed to the computers before they enter the university.

Table 4.6: Number of Years Students Use the Computers by Gender (n=206).

Number of years using the computer before entering the university		Gender		Total
		Male	Female	
Less than 1 year	Count	23	32	55
	% within Column	24.5%	28.6%	26.7%
1-2 years	Count	42	47	89
	% within Column	44.7%	42.0%	43.2%
3-4 years	Count	18	19	37
	% within Column	19.1%	17.0%	18.0%
5-6 years	Count	2	10	12
	% within Column	2.1%	8.9%	5.8%
More than 7 years	Count	8	4	12
	% within Column	8.5%	3.6%	5.8%
No answer	Count	1	-	1
	% within Column	1.1%	-	.5%
Total	Count	94	112	206
	% within Column	100.0%	1.00%	100.0%

The results indicate that about 70% of the students have 1 to 2 years computer experience prior to entering the degree programme. This reflect that they might have gained the experience while studying in the upper secondary schools, attending computer courses or whilst working.

(b) Computer Competency

Question 8 of the questionnaire assesses the students’ ability level in using several computer-related functions such as using word processing, e-mail and programming. The question uses the Likert Scales ranging from 1 to 10 and the scale of 1 to 2 is considered “Very poor”, scale 3 to 4 is used for “Poor”, scale 5 to 6 is

considered “Fair”, scale 7 to 8 is considered “Good” and scale of 9 to 10 is considered “Excellent”. The data collected is shown in Table 4.7 and the results of the findings are present as follows:

(i) Word processing

Table 4.7 shows that more than half of the students (135 or 65.5%) consider themselves as “Good” in using word processing. A total of 35 (17.0%) students check “Excellent” and 34 (16.5%) check “Fair”. Only one (0.5%) student evaluates himself as just a poor user of word processing and one (0.5%) student does not answer the question.

(ii) Spreadsheets

Many students (97 or 47.1%) grade themselves as “Good” in using spreadsheets and only 9 (4.4%) students classify themselves as excellent users. A total of 78 (37.8%) students check “Fair”, 18 (8.7%) students check “Poor” and 3 (1.5%) students check “Very poor”. Only one (0.5%) student does not answer the question.

(iii) Desktop publishing

The data shows that 97 (47.1%) students classify themselves as good users of desktop publishing. Only 10 (4.9%) judge themselves as excellent users. Seventy six (36.9%) students answer “Fair”, 17 (8.3%) students answer “Poor” and 4 (1.9%) answer “Very poor”. Two (1.0%) students do not reveal the answers.

(iv) Databases

The majority of students (99 or 48.1%) regard themselves as “Fair” in building databases. Less than 40% (77 or 37.4%) students grade themselves as “Good”, six (2.9%) regard themselves as “Excellent” and 19 (9.2%) students grade their skill as poor. Four (1.9%) students assess themselves as “Very poor” in building databases and 1 (0.5%) student does not answer the question.

(v) E-mail

It is very encouraging to see that high percentage of students (152 or 73.8%) rate themselves as “Excellent” in using the e-mail. Thirty-six (17.5%) students grade themselves as “Good”, 15 (7.3%) students grade themselves “Fair” and 2 (1.0%) students grade themselves “Poor”. Only 1(0.5%) student does not answer the question.

(vi) Programming

When students are asked to rate their ability level in programming, half of the students (104 or 50.5%) check “Fair” and only 72 (35.0%) students check “Good”. Nineteen (9.2%) students regard themselves as just poor programmers, whereas 3 (1.5%) students assess themselves as “Very poor”. Only a very small number of students (7 or 3.4%) classify themselves as excellent in programming. One student (0.5%) does not reveal his answer.

Table 4.7: Computer Competency

Computer competency	Ability level						Total
	Very poor	Poor	Fair	Good	Excellent	No answer	
Word processing (n=206)	-	1 0.5%	34 16.5%	135 65.5%	35 17.0%	1 0.5%	206 100.0%
Spreadsheets (n=206)	3 1.5%	18 8.7%	78 37.8%	97 47.1%	9 4.4%	1 0.5%	206 100.0%
Desktop publishing (n=206)	4 1.9%	17 8.3%	76 36.9%	97 47.1%	10 4.9%	2 1.0%	206 100.0%
Databases (n=206)	4 1.9%	19 9.2%	99 48.1%	77 37.4%	6 2.9%	1 0.5%	206 100.0%
E-mail (n=206)	-	2 1.0%	15 7.3%	36 17.5%	152 73.8%	1 0.5%	206 100.0%
Programming (n=206)	3 1.5%	19 9.2%	104 50.5%	72 35.0%	7 3.4%	1 0.5%	206 100.0%
Web site construction (n=206)	7 3.4%	22 10.7%	57 27.7%	112 54.4%	7 3.4%	1 0.5%	206 100.0%
Locating and retrieving relevant information via the Internet or World Wide Web (n=206)	2 1.0%	2 1.0%	25 12.1%	97 47.1%	74 35.9%	6 2.9%	206 100.0%

Note: Very poor= 1-2; Poor=3-4; Fair=5-6; Good=7-8; Excellent=9-10.

(vii) Web site construction

The majority, (112 or 54.4%) students regard themselves as “Good” in building web sites. A total of 57 (27.7%) students grade themselves as “Fair” and 22 (10.7%) students grade their skill as “Poor”. Seven (3.4%) students assess themselves

as “Very poor” in building web sites. Only a very small number of students (7 or 3.4%) have excellent skill in web site construction. However, 1(0.5%) student do not answer the question.

(viii) Locating and retrieving relevant information via the Internet or World Wide Web

Table 4.7 presents information about the students’ ability in locating and retrieving relevant information via the Internet or World Wide Web (WWW). The Table indicates that 97 (47.1%) students rate themselves as good in searching and retrieving information via the Internet or WWW and 74 (35.9%) students consider themselves “excellent”. On the other hand, a total of 25(12.1%) students rate themselves as “Fair” and only 2 (1.0%) students respectively grade themselves as “Poor” and “Very poor” users in finding and retrieving information from the Internet or WWW. Six (2.9%) students do not answer the question.

Generally, the results reveal that if the scale of 80% and above is considered excellent, students achieve these scores for word processing, searching and retrieving information and especially for e-mailing. Most students are averagely skilled (50%-60%) in using the spreadsheets, desktop publishing and constructing websites. However, many students judge themselves as poor for programming and creating databases.

(c) Use of Internet

Information on the number of year(s) students use the Internet and hours spent on the Internet per week are collected through questions 9 and 10.

Table 4.8: Number of years using the Internet by Gender (n=206).

Number of years using the Internet		Gender		Total
		Male	Female	
Less than 1 year	Count	2	1	3
	% within Column	2.1%	0.9%	1.5%
1-2 years	Count	17	12	29
	% within Column	18.1%	10.7%	14.1%
3-4 years	Count	51	65	116
	% within Column	54.3%	58.0%	56.3%
5-6 years	Count	17	26	43
	% within Column	18.1%	23.2%	20.9%
More than 7 years	Count	6	8	14
	% within Column	6.4%	7.1%	6.8%
No answer	Count	1	-	1
	% within Column	1.1%	-	.5%
Total	Count	94	112	206
	% within Column	100.0%	100.0%	100.0%

The majority of the students 116 (56.3%) reveal that they used the Internet for three to four years. Table 4.8 indicates that female students (65 or 58.0%) who have used the Internet for three to four years are more than male students (51 or 44.3%). Forty-three students (20.9%) answer “5-6 years”, again more female students who have used the Internet for six years are more than male students. Twenty nine (14.1%) check “1-2 years” and 14 (6.8%) check “more than 7 years”. Out of 14 students who check “more than 7 years”, 8 (7.1%) are female students and 6 (6.4%) are male students. Only a very small number of students (3 or 1.5%) note that they have been using the Internet for less than a year. Overall, the data verify that the students selected in the sample are Internet users.

Table 4.9: Number of Years and Hours Students Use the Internet Per Week (n=206).

Hours on Internet per week		Number of years using the Internet						Total
		Less than 1 year	1-2 years	3-4 years	5-6 years	More than 7 years	No answer	
Less than 1 hour	Count	1	2	-	-	-	-	3
	%	0.5%	1.0%	-	-	-	-	1.5%
1-2 hours	Count	2	2	9	5	1	-	19
	%	1.0%	1.0%	4.4%	2.4%	0.5%	-	9.2%
3-4 hours	Count	-	7	10	6	2	-	25
	%	-	3.4%	4.9%	2.9%	1.0%	-	12.1%
5-6 hours	Count	-	9	39	7	3	-	58
	%	-	4.4%	18.9%	3.4%	1.5%	-	28.2%
More than 7 hours	Count	-	9	58	25	8	-	100
	%	-	4.4%	28.2%	12.1%	3.9%	-	48.5%
No answer given	Count	-	-	-	-	-	1	1
	%	-	-	-	-	-	0.5%	0.5%
Total	Count	3	29	116	43	14	1	206
	%	1.5%	14.1%	56.3%	20.9%	6.8%	0.5%	100.0%

Table 4.9 shows the frequency of hours the students spent online on the Internet per week. It is unsurprising, to see that many students (100 or 48.5%) spend more than seven hours per week accessing the Internet. About 58 (28.2%) students admit using the Internet for “5-6 hours”, 25 (12.1%) check “3-4 hours”, 19 (9.2%) check “1 hour” and only 3 (1.5%) of them spent less than an hour online per week. Overall, the students who spend more time on the Internet weekly are those who have longer years using the Internet.

4.3.2 Cognitive Factors

Questions 11, 12, 13 and 14 in Part B of the questionnaire identifies cognitive factors that might be influenced students in using e-books such as their understanding of electronic books, awareness and impression of using e-book services at the University of Malaya Library (UML).

a) Awareness that the UML Subscribe to E-Books.

Table 4.10 presents data on how the students become aware that the UML subscribe to e-books based on gender. Half of the students (103 or 50.0%) discover the e-books service via the UML web site. About 17.5% (36) students become aware of the e-books service at the UML through their lecturers. There are 26 (23.2%) female students and 10 (10.6%) male students who find out about the existence of e-books service via their lecturers.

Twenty-seven (13.1%) of the students find out the availability of e-books service at the UML from librarians, 26 (12.6%) obtain such information from their colleagues or friends and only 6 (2.9%) of the students notice the services via the UML's brochures and pamphlets. However, 3 (1.5%) students check "Other". The results show that a high percentage of students (96.1%) are aware of the availability of e-books service at the UM Library and UM Library web site, lecturers, colleagues and librarians are the main sources of information.

Table 4.10: How Students Discover the UML subscribe to E-books by Gender (n=206).

How did you find out that the UML subscribe to e-books		Gender		Total
		Male	Female	
UM Library web site	Count	52	51	103
	% within Column	55.3%	45.5%	50.0%
Lecturers	Count	10	26	36
	% within Column	10.6%	23.2%	17.5%
Colleagues/Friends	Count	12	15	27
	% within Column	12.8%	13.4%	13.1%
Librarians	Count	15	11	26
	% within Column	16.0%	9.8%	12.6%
UM Library brochures/pamphlets	Count	-	6	6
	% within Column	-	5.4%	2.9%
No answer	Count	3	2	5
	% within Column	3.2%	1.8%	2.4%
Other	Count	2	1	3
	% within Column	2.1%	0.9%	1.5%
Total	Count	94	112	206
	% within Column	100.0%	100.0%	100.0%

b) Students' Understanding of E-books.

Over 50% (115) of the students perceive an e-book as an electronic text or e-text. Table 4.11 shows that 61 students (29.6%) relate e-book as the combination of electronic text, e-book reading devices and e-book software. Relatively, very few students associate e-book as an e-book software (10 or 4.9%) or an e-book reader (8 or 3.9%). However, 8 (3.9%) students indicate that they do not know what an e-book is and 4 (1.9%) students do not respond to this question.

c) Impression of Using an E-book

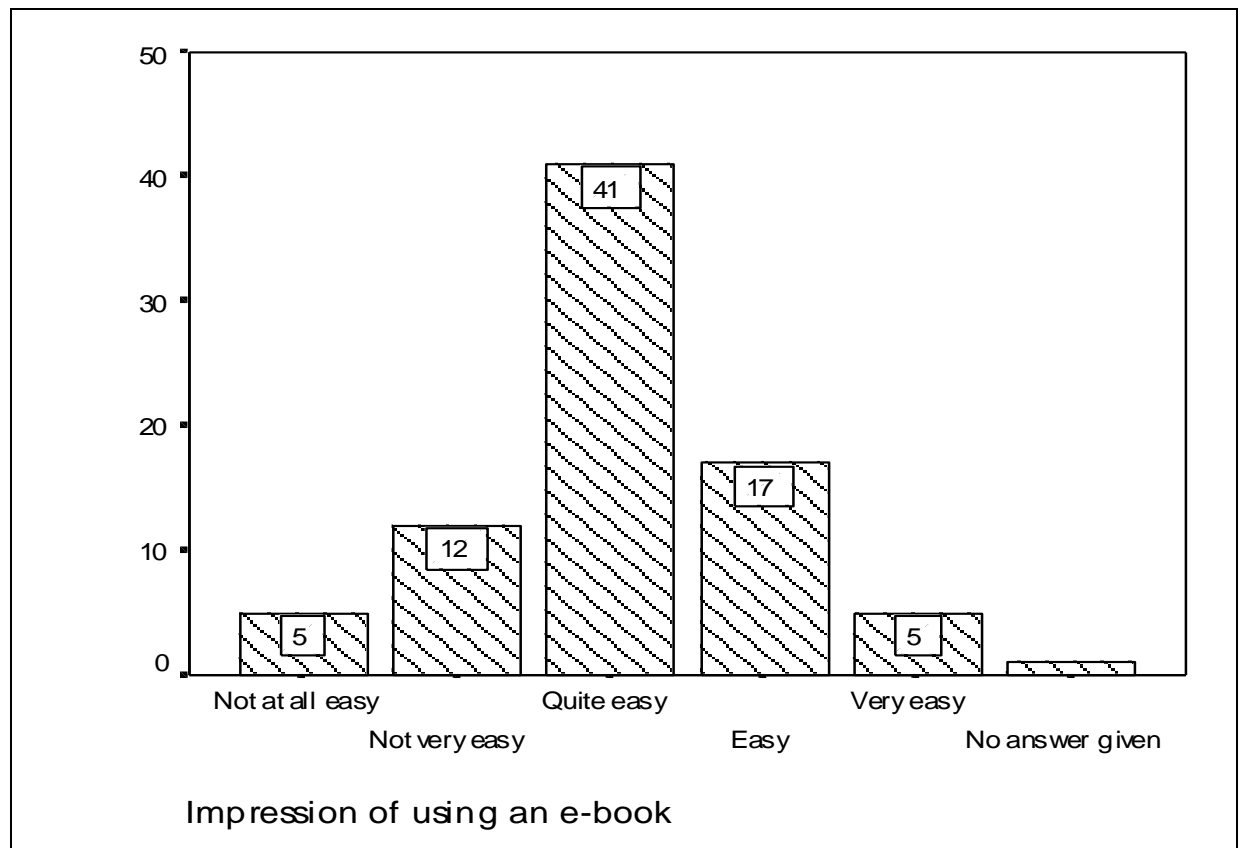
Figure 4.3 indicates that majority of students find that e-books are easy rather than difficult to use. A total of 41 (50.6%) students find e-books “quite easy”. Out of

this number 23 (54.8%) are male students and 18 (46.2%) are female students (Table 4.12). 17 (21.0%) users or 10 (25.6%) female students and 7 (16.7%) male students find e-books “easy”.

Table 4.11: Perception of E-books (n=206).

	Count	%
Electronic text (e-text)	115	55.8
E-text + e-book devices + e-book software	61	29.6
E-book software	10	4.9
E-book reader/devices	8	3.9
Don't know	8	3.9
No answer	4	1.9
Total	206	100.0

Figure 4.3. Impression of Using an E-book (n=81).



Only 5 (6.2%) users indicate it “very easy” to access. However, more male students (4 or 9.5%) evaluate e-books are very easy to use than female students (1 or 2.6%). On the other hand, about 14.8% (12) students check “not very easy” to use and 5 (6.2%) find it “not all easy” to use. Only, 1 student (1.2%) does not indicate his impression.

Table 4.12: Impression of Using an E-book by Gender (n=81).

Impression of using an e-book		Gender		Total
		Male	Female	
Not at all easy	Count	2	3	5
	% within Column	4.8%	7.7%	6.2%
Not very easy	Count	5	7	12
	% within Column	11.9%	17.9%	14.8%
Quite easy	Count	23	18	41
	% within Column	54.8%	46.2%	50.6%
Easy	Count	7	10	17
	% within Column	16.7%	25.6%	21.0%
Very easy	Count	4	1	5
	% within Column	9.5%	2.6%	6.2%
No answer	Count	1	-	1
	% within Column	2.4%		1.2%
Total	Count	42	39	81
	% within Column	100.0%	100.0%	100.0%

d) Students’ Reaction Towards E-book Services at the UML

Feedback on students’ reaction towards the provision of e-books service at the UML web site is requested through Question 13. Both the e-books users and non-users are asked to indicate how they feel towards the e-book services at the UML. Five statements describing their likely responses are posted ranging from negative statement (“Very negative”) to positive statement (“Very positive”).

Figure 4.4: Students' Reaction Towards E-book Services at the UML (n=206).

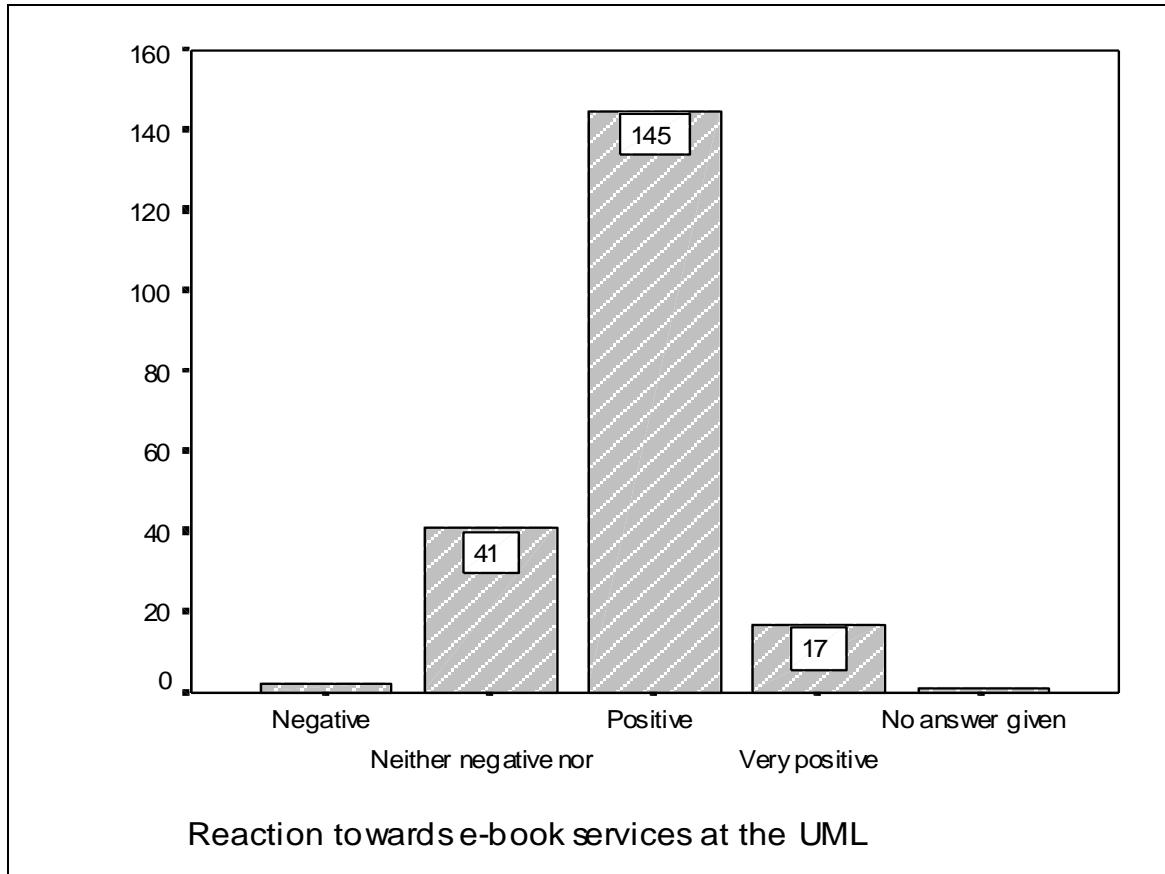


Figure 4.4 shows that 70% (145) of the students are positive towards e-book services at the UML. Seventeen (8.3%) students give more encouraging response, as they are very positive towards the introduction of the service. In contrast, 41 (19.9%) students feel neutral that is neither negative nor positive about the e-book services and 2 (1.0%) students are negative about the service. Only 1 (0.5%) student does not answer the question. The results indicate that e-books service has received positive support by more than 70% of the computer science and information technology (IT) students in the sample.

Answers to Question 14 provide the reasons why students have such reactions. A cross tabulation of reasons given by students on their reaction toward the

e-book services and reaction towards e-book services at the UML is shown in Table 4.13. The data describes discouraging responses as only 74 (35.9%) students indicate their reasons whereas the majority of the students (132 or 64.1%) do not answer this question. This is probably due to the open-form question that may not encourage many students to write down their reasons.

Table 4.13: Reasons for Having Such Reactions Towards E-book Services at the UML (n=206).

Why you think you have such reaction to the e-book services		Reaction towards e-book services at the UML					Total
		Negative	Neutral	Positive	Very positive	No answer	
Responded	Count	1	19	43	11	-	74
	% within column	50.0%	46.3%	29.7%	64.7%	-	35.9%
No answer	Count	1	22	102	6	1	132
	% within column	50.0%	53.7%	70.3%	35.3%	100.0%	64.1%
Total	Count	2	41	145	17	1	206
	% within column	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

One (50.0%) student who has negative reaction towards e-books service at the UML indicates that they prefer printed books. The most cited reasons reveal by 19 (46.3%) students who has neutral feeling towards the service are:

- Never used/tried the e-book service prior to the survey [7 or 17.1%];
- Prefer to read printed books [6 or 14.6%];
- Prefer to search information via the Internet [2 or 4.9%];
- Not aware of the service [2 or 4.9%];
- No interest [1 or 2.4%];
- “Not much use for me...” [1 or 2.4%];

On the other hand, the most cited reasons by students (43 or 29.7%) who has expressed positive reaction towards the e-books service are:

- Easy access [10 or 6.9%];
- Accessible online [8 or 5.5%];
- Accessible 24x7 [7 or 4.8%];
- Easy to search relevant information [5 or 3.4%];
- Convenient [4 or 2.8%];
- Economical, Free [2 or 1.4%];
- User friendly [3 or 2.1%];
- Time-saving [2 or 1.4%];
- “Save library space” [1 or 0.7%];
- “Very easy to cut and paste” [1 or 0.7%];

The following reasons are described by those students who have very positive impression towards the e-books service:

- Available online [4 or 23.5%];
- Searchable [3 or 17.6%];
- Economical [2 or 11.8%];
- User friendly [1 or 5.9%];
- “Alternative service for library users” [1 or 5.9%].

When summarising the reasons given by students who have positive and very positive reaction towards the e-books service, the results show that they are related to the several advantages of e-books (Table 4.14).

Table 4.14. Advantages of E-Books and Reactions Towards E-Books Services at the UML.

No.	Advantages	Reaction towards e-books services at the UML.		Total (n=54)
		Positive	Very positive	
1.	<u>Availability value</u>			
	Available online	8 5.5%	4 23.5%	12 22.2%
	Easy access	10 6.9%	-	10 18.5%
	Accessible 24x7	7 4.8%	-	7 12.9%
2.	<u>Enticing value</u>			
	Convenient	4 2.8%	-	4 7.4%
	User friendly	2 2.1%	1 5.9%	4 7.4%
	Alternative service for library users	-	1 5.9%	1 1.9%
3.	<u>Handling value</u>			
	Easy to search	3 3.4%	-	5 9.2%
	Searchable	-	3 17.6%	3 5.6%
	Easy to cut and paste	1 0.7%	-	1 1.9%
4.	<u>Cost value</u>			
	Economical, free	2 1.4%	2 11.8%	4 7.4%
	Time saving	4 1.4%	-	2 3.7%
	Save library space	1 0.7%	-	1 1.9%

The advantages of e-books summarise from the findings include several values such as availability, enticing, handling and cost. Overall findings indicate that availability is given the highest priority by the majority of students (29 or 52.7%). In this category, “available online” and “easy access” are considered the most important reasons, which are indicated by 12 (22.2%) and 10 (18.5%) students respectively. As for 7 (12.9%) students, “accessible 24x7” is considered valuable for them. These attributes are given greater importance by students, as e-books are similar to any form of digital information, that can be accessed anywhere at anytime when needed. Thus, it corresponds to their information needs.

Students give positive impression towards the e-books service at the UML because it is convenient (4 or 7.4%), user friendly (4 or 7.4%) and offer alternative

service for library users (1 or 1.9%). These enticing values are preferred by students as they tend to select an information source, which is user friendly and convenience. Students regard handling value as third in rank. Relatively, they give major considerations to attributes such as “easy to search” (5 or 9.2%), “searchable” (3 or 5.6%) and “easy to cut and paste” (1 or 1.9%). These attributes are valuable for users as e-books are different from printed books. With additional features, e-book users can browse, navigate and search for keyword or full text within a book and across a collection of books.

Cost seems to be the least important among all the reasons given by the students. In this category, “economical and free” is given the highest priority (4 or 7.4%) by the students. This can be due to the fact that the e-books service is made available for free for UM students to access via the UML website. Besides this, there are a number of other web sites on the Internet, which provide free access to e-books or e-texts such as by Project Gutenberg, Bartleby.com and the Internet Public Library. Students also regard “time saving” (2 or 3.7%) and “save library space” (1 or 1.9%) as another reasons why they have positive impression towards the e-books service.

4.3.3 Access Factors

Access factors refer to the means or gateways students use to access the e-books and places where students conduct their searches on the e-books service.

a) Using Gateways to Access E-books

In question 17, students are asked which gateway(s) they use to access the e-books service. More than half of the students (53 or 65.4%) consider UM Library

web site as the most favourable gateway to access e-books (Table 4.15). There are 28 (71.8%) female students and 25 (59.5%) male students who check “UM Library web site”. Ten (12.3%) students comprising 6 (14.3%) male students and 4 (10.3%) female students, prefer to access the e-books via the UM Library web site and other libraries' web sites. The other library web site indicates by them is via the web site of Digital Library, Open University Malaysia.

Only 7 (8.6%) students check “via other free webs or homepages”, out of this number, 5 (11.9%) are male students and 2 (5.1%) are female students. Another 6 (7.4%) students gain access via the “UM Library web site and other free webs or homepages”. However, there are more female students than male students who opt for this option. Three (3.7%) students access e-books through other libraries' web sites. Only one (1.2%) student opts for all the options provided in the Question 17 and 1.2% (1) does not respond the question.

Table 4.15: Gateways Use to Access E-books by Gender (n=81).

How do you access the e-books		Gender		Total
		Male	Female	
Via the UM Library web site	Count % within Column	25 59.5%	28 71.8%	53 65.4%
Via the UM Library web site and other libraries' we site	Count % within Column	6 14.3%	4 10.3%	10 12.3%
Via other free Web/Homepages	Count % within Column	5 11.9%	2 5.1%	7 8.6%
Via the UM Library web site and other free Web/Homepages	Count % within Column	1 2.4%	5 12.8%	6 7.4%
Via other libraries' web site	Count % within Column	3 7.1%	-	3 3.7%
All above	Count % within Column	1 2.4%	-	1 1.2%
No answer	Count % within Column	1 2.4%	-	1 1.2%
Total	Count % within Column	42 100.0%	39 100.0%	81 100.0%

b) Place of Access

Table 4.16 summaries the places where students conduct their searches on the e-books service. About 55.6% (45) of the students gain access to e-books from the Faculty of Computer Science and Information Technology. More male students prefer to access the e-books from the faculty’s computer labs compare to female students. A total of 20 (24.7%) students gain access from their homes, 13 (16.0%) students are from the UM Library and 1 (1.2%) from “other” place. The other place cited by the student is the cyber cafés. Only 2 (2.5%) students do not answer the question. This indicates that, users of e-books are among the remote library users.

Table 4.16: Place of Access by Gender (n=81).

Place of Access		Gender		Total
		Male	Female	
At the faculty	Count % within Column	25 59.5%	20 51.3%	45 55.6%
At home	Count % within Column	10 23.8%	10 25.6%	20 24.7%
In the UM Library	Count % within Column	6 14.3%	7 17.9%	13 16.0%
Other	Count % within Column	-	1 2.6%	1 1.2%
No answer	Count % within Column	1 2.4%	1 2.6%	2 2.5%
Total	Count % within Column	42 100.0%	39 100.0%	81 100.0%

4.3.4 Functional Factors

Functional factors can be prevalent influence for students, especially when they need information that are practical and useful for them. There are numbers of questions that specifically designed to investigate why students use e-books as well as their preferred format for reading a textbook and reference book.

a) Reasons for Using the E-Books

Question 24 of the questionnaire provides a list of reasons for using e-books, and there are “other” options where students could indicate other reasons. Results are summarised in Table 4.17. The table shows that “available online” takes the highest percentage that is 64.2% (52). A total of 37 (45.7%) e-book users use e-books because it provides faster and easy access to new titles, whereas 33 (40.7%) students use e-books because they do not require physical visit to the library. According to 31 (38.3%) students, they access e-books service respectively because it is convenient and easy to access.

Table 4.17: Reasons for Using E-books (n=81).

Reasons	Count	%
Available online	52	64.2
Faster and easy access to new titles	37	45.7
Not require physical visit to the library	33	40.7
Easy to search	31	38.3
Convenient	31	38.3
Have user-friendly features	17	21.0
Available around the clock	13	16.0
Other reasons	3	3.7
No answer	3	3.7

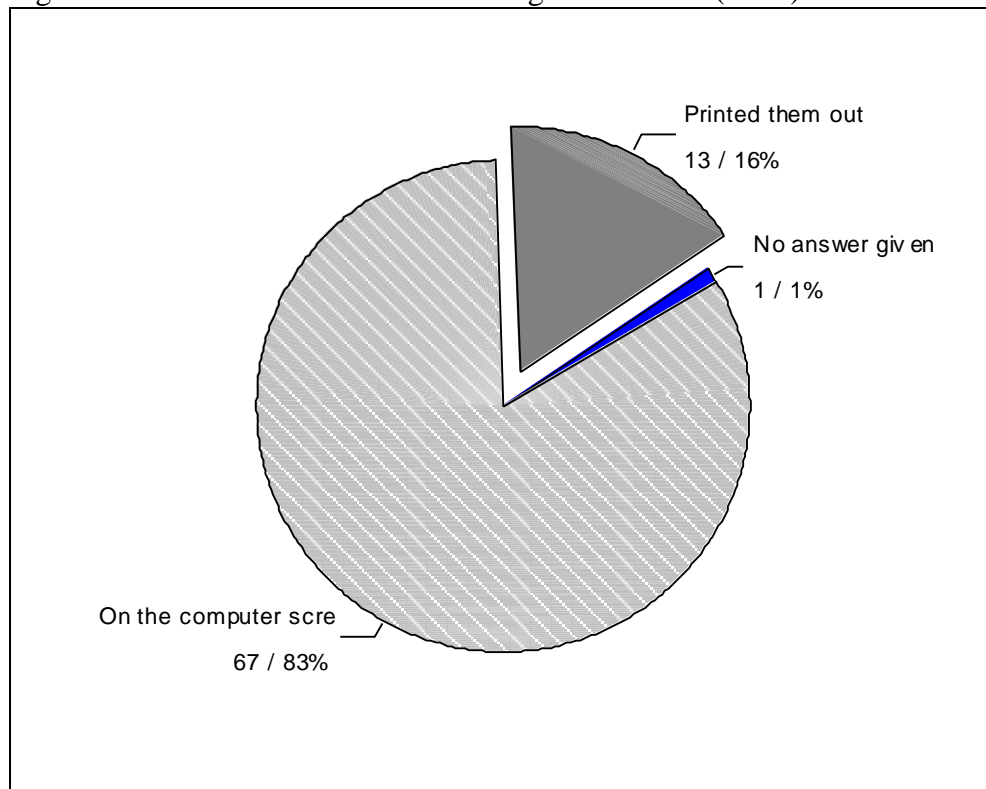
Note: Students are permitted to give more than one answers.

However, very few (17 or 21.0%) students check “e-books have user-friendly features” and 13 (16.0%) students check “available around the clock” as their reasons for using e-books. Three (3.7%) students check “other reasons”. Other reasons include; “I can access from anywhere”, “Free” and “Save more time”. Only 3 (3.7%) of the students do not answer the question.

b) Preferred Method for Reading the E-books

Question 25 is designed to investigate how students read their e-books. When given a choice between reading the content of e-books via the computer screen or printing them out, surprisingly many students (67 or 82.7%) opt for reading on the computer screen (Figure 4.5). In contrast, 13 (16.0%) students indicate their preference for print format when reading the full chapter(s) or page(s) of e-books. Only one (1.2%) student does not reveal his answer.

Figure 4.5: Preferred Method for Reading the E-books (n=81).



Cross tabulation of the preferred method for reading the e-books and the impression of using an e-book is shown in Table 4.18. The majority of students (52 or 77.7%) who read e-books on the computer screen are those who have “quite easy”, “easy” and “very easy” impression when using the e-books. Only 15 (22.4%) students who indicate their preference for reading e-books on the computer screen have negative impression of using an e-book such as “not at all easy” and “not very easy”. It appears that higher percentage of students who have positive impression of using an e-book would prefer to read e-books via the computer screen.

Table 4.18: Preferred Method for Reading E-Books and Impression of Using an E-Book (n=81).

Impression of using an e-book		Preferred method for reading e-books		
		On the computer screen	Printed them out	Total
Not at all easy	Count	4	1	5
	% within Column	6.0%	7.7%	6.3%
Not very easy	Count	11	1	12
	% within Column	16.4%	7.7%	15.0%
Quite easy	Count	33	8	41
	% within Column	49.3%	61.5%	51.3%
Easy	Count	14	3	17
	% within Column	20.9%	23.1%	21.3%
Very easy	Count	5	-	5
	% within Column	7.5%	-	6.3%
Total	Count	67	13	81
	% within Column	100.0%	100.0%	100.0%

4.4 Use of Electronic Books

Information on the use of e-books among students is requested using Part C of the questionnaire. The data collected are presented in the section that follows.

4.4.1 E-books Usage

Question 15 is designed to investigate whether the students use the e-books prior to the survey. The majority of students (125 or 60.7%) have not used the e-books before the survey (Table 4.19). Only 81 (39.3%) students have previously used the e-books. The table also shows the level of usage based on gender. More male students (42 or 44.7%) use e-books than female students (39 or 34.8%). In contrast, more female students (73 or 65.2%) do not use e-books than male students (52 or 55.3%).

Table 4.19. E-books Usage by Gender (n=206).

Used e-book in the past		Gender		Total
		Male	Female	
No	Count	52	73	125
	Expected Count	57.0	68.0	125.0
	% within Column	55.3%	65.2%	60.7%
Yes	Count	42	39	81
	Expected Count	37.0	44.0	81.0
	% within Column	44.7%	34.8%	39.3%
Total	Count	94	112	206
	Expected Count	94.0	112.0	206.0
	% within Column	100.0%	100.0%	100.0%

$\chi^2=2.082$, $df=1$, $p = 0.149$

The relationship between gender and use of e-books is tested by using the Chi-square test. The result shows the observed significance level (p) for the Pearson Chi-square value is $\chi^2 = 2.082$, $df=1$, $p = 0.149$. Since $p=0.149$ is greater than alpha level of significance of 0.05. This indicates no significant difference between male and female students for their use of e-books. Thus, it can be concluded that the use of e-books do not have a significant relationship with gender of the users.

From the table 4.20, almost 50.0% (37) of e-book users spend more than seven hours a week online accessing Internet. This is followed by 21 (26.3%) e-book users who spend five to six hours accessing the Internet. Not surprisingly, only 2.5% of those who use e-books only spend less than an hour on the Internet per week. It shows that, more percentage of e-books users are among the heavy users of Internet.

Table 4.20. E-books Usage by Hours a Week Spend Online Accessing Internet (n=205).

Used e-books in the past		Hours a week spend online accessing Internet					Total
		< 1 hour	1-2 hours	3-4 hours	5-6 hours	> 7 hours	
No	Count	1	8	16	37	63	125
	Expected Count	1.8	11.6	15.2	35.4	61.0	125.0
	% within Row	0.8%	6.4%	12.8%	29.6%	50.4%	100.0%
Yes	Count	2	11	9	21	37	80
	Expected Count	1.2	7.4	9.8	22.6	39.0	80.0
	% within Row	2.5%	13.8%	11.3%	26.3%	46.3%	100.0%
Total	Count	3	19	25	58	100	205
	Expected Count	3.0	19.0	25.0	58.0	100.0	205.0
	% within Row	1.5%	9.3%	12.2%	28.3%	48.8%	100.0%

$\chi^2 = 4.268$, $df=4$, $p = 0.371$

The result of Chi-square test shows the observed significance of $\chi^2 = 4.268$, $df = 4$, $p = 0.371$ which is greater than alpha level of significance of 0.05. Therefore, there is no significant relationship between use of e-books and the hours spend online accessing the Internet per week. This implies that the e-books' users are not necessarily among the heavy users of Internet.

4.4.2 Frequency of Use

One of the purposes of the survey is to identify the frequency of e-books use. Question 19 is constructed in term of time scale such as “daily”, “weekly”, “monthly” and “occasionally”. The results are not very encouraging. Table 4.21 presents that a large number of e-book users use the service “occasionally” (46 or 58.2%), 17 (21.5%) on weekly basis and 16 (20.3%) on monthly basis.

Table 4.21. Frequency of Use by Gender (n=79).

Frequency		Gender		Total
		Male	Female	
Weekly	Count	12	5	17
	Expected Count	8.6	8.4	17.0
	% within Column	30.0%	12.8%	21.5%
Monthly	Count	11	5	16
	Expected Count	8.1	7.9	16.0
	% within Column	27.5%	12.8%	20.3%
Occasionally	Count	17	29	46
	Expected Count	23.3	22.7	46.0
	% within Column	42.5%	74.4%	58.2%
Total	Count	40	39	79
	Expected Count	40.0	39.0	79.0
	% within Column	100.0%	100.0%	100.0%

$\chi^2 = 8.251$, $df = 2$, $p < 0.05$

Relatively, more male students (23 or 57.5%) use the service on a weekly and monthly basis than female students (10 or 25.6%). On the other hand, more female students (29 or 74.4%) use e-books occasionally than male students (17 or 42.5%).

The relationship between frequency of e-books use and gender is tested by using the Chi-square test. The result indicates that there is a highly significant difference in frequency of e-books use among the male and female students. ($\chi^2 = 8.251$, $df=2$, $p=0.016$).

4.4.3 Hours Spent Online Accessing E-Books Service Per Week.

It is interesting to know how many hours the students spend online accessing the e-book service per week. The results reveal that fewer than half of the students (35 or 43.2%) spend 1-2 hours a week using the e-books (Table 4.22).

Table 4.22: Hours Spent Online Accessing E-Books Per Week by Gender (n=81).

Hours		Gender		Total
		Male	Female	
Less than 1 hour	Count	13	8	21
	% within Column	31.7%	20.0%	25.9%
1-2 hours	Count	16	19	35
	% within Column	30.9%	47.5%	43.2%
3-4 hours	Count	10	12	22
	% within Column	24.4%	30.0%	27.2%
5-6 hours	Count	1	1	2
	% within Column	2.4%	2.5%	2.5%
More than 7 hours	Count	1	-	1
	% within Column	2.4%	-	1.2%
Total	Count	41	40	81
	% within Column	100.0%	100.0%	100.0%

A total of 19 (47.5%) female students and 16 (39.0%) male students check “1-2 hour”. Only 22 (27.2%) students use the service for 3-4 hours and 21 (25.9%) use it

less than an hour a week. More male students (13 or 31.7%) spend less than an hour a week accessing e-books service than female students (8 or 20.0%). Very few students (2 or 2.5%) use e-books for 5-6 hours and only one student (1.2%) use it more than 7 hours.

Cross tabulation of hours spent online accessing e-books per week and hours spent online accessing Internet per week is shown in Table 4.23.

Table 4.23: Hours Spent Online Accessing E-Books and Internet Per Week (n=81).

Hours spend online accessing Internet per week		Hours spend online accessing e-books per week					Total
		<1 hour	1-2 hours	3-4 hours	5-6 hours	>7 hours	
< 1 hour	Count % within Row	2 100.0%	-	-	-	-	2 100.0%
1-2 hours	Count % within Row	7 63.6%	3 27.3%	1 9.1%	-	-	11 100.0%
3-4 hours	Count % within Row	3 33.3%	4 44.4%	1 11.1%	-	1 11.1%	9 100.0%
5-6 hours	Count % within Row	5 23.8%	11 52.4%	4 19.0%	1 4.8%	-	21 100.0%
>7 hours	Count % within Row	4 10.5%	17 44.7%	16 42.1%	1 2.6%	-	38 100.0%
Total	Count % within Row	21 25.9%	35 43.2%	22 27.2%	2 2.5%	1 1.2%	81 100.0%

A total of 22 (27.2%) students who spend 3-4 hours accessing e-books a week are those who spend “1-2 hours”, “3-4 hours”, “5-6 hours” and “more than 7 hours” accessing the Internet per week. Similarly, 35 (43.7%) students who spend “1-2 hours” a week accessing e-books are those who spend “3-4 hours”, “5-6 hours” and “more than 7 hours” a week surfing the Net. Relatively, very few students (11.1% or

1) who spend more than seven hours a week accessing e-books are among students who spend “3-4 hours” on the Internet. The results indicate that students who spend longer hours on the Internet tend to spend longer hours on e-books.

4.4.4 Subject of E-books Use Most Often by Students

Students are asked what subject of e-books they use most often. Results indicate that the most popular subject of e-books among the students is Computer Science and Information Technology (Table 4.24). The subject has been chosen by 30 (76.9%) female students and 28 (66.7%) male students bringing a total of 58 (71.6%) users. This is to be expected since they are IT students. The “General” subject appears to be at the second rank (19 or 23.5%). There are 10 (23.8%) male students and 9 (23.1%) female students who choose the subject. The most unpopular subjects are “Health and Medicine” and “Economics and Business” (1 or 1.2%) respectively. Only two (2.5%) students do not answer the question.

Table 4.24: Subjects of E-Book Use Most Often by Gender (n=81).

Subjects		Gender		Total
		Male	Female	
Computer science and Information Technology	Count % within Column	28 66.7%	30 76.9%	58 71.6%
General	Count % within Column	10 23.8%	9 23.1	19 23.5%
Health and Medicine	Count % within Column	1 2.4%	-	1 1.2%
Economics and Business	Count % within Column	1 2.4%	-	1 1.2%
No answer	Count % within Column	2 4.8%	-	2 2.5%
Total	Count % within Column	42 100.0%	39 100.0%	81 100.0%

4.4.5 Purpose of Using the E-books

Students use the e-books service for a variety of purposes and the reasons are provided by the Question 22. These include “for assignments/research projects”, “for reference”, “for leisure reading” and “for browsing”. There are also the “other” options where students could indicate other purposes. Results demonstrate that 44 (54.3%) of the students use e-books primarily for writing their assignments or research projects (Table 4.25). Proportionally, half of male students (23 or 54.8%) and female students (21 or 53.8%) use e-books for writing their assignments or research projects.

Table 4.25: Primary Purpose of Using the E-books by Gender (n=81).

Gender		Primary purpose of using the e-books						Total
		For assignments/ research projects	For reference	For leisure reading	For browsing (e.g scan table of content)	Other purposes	No answer	
Male	Count % within Row	23 54.8%	12 28.6%	4 9.5%	-	1 2.4%	2 4.8%	42 100.0%
Female	Count % within Row	21 53.8%	13 33.3%	1 2.6%	3 7.7%	1 2.6%	-	39 100.0%
Total	Count % within Row	44 54.3%	25 30.9%	5 6.2%	3 3.7%	2 2.5%	2 2.5%	81 100.0%

A total of 25 (30.9%) students said they use e-books for their reference. Only five (6.2%) students check “leisure reading” as their main purpose of using the e-books. Table 18 reveals that many male students (4 or 9.5%) read e-books for their

leisure reading than female students (1 or 2.6%). Two (2.5%) students both male and female, use e-books for “other purposes”. The other purposes cited by them are “For searching relevant information” and “for exam”. However, another two male students do not reveal their purposes of using the e-book service. This indicates that e-books seem to be used for educational purposes to serve the students’ learning needs.

4.4.6 Percentages of E-Book Data Included in Students’ Works.

E-book users are asked on the percentages of e-book data they include in their research projects or assignments. Citation refers to an act of citing any words or lines taken from an e-book in the students’ works such as their assignments or research projects. According to Table 4.26, about 46.8% (37) students admit that they cite less than 10% of the e-book data in their researches, projects, assignments or bibliographies. It is quite surprising, as majority of them (19 or 76.0%) are those who have referred the e-books primarily for references and 18 (40.9%) students are those who have used e-books for writing their assignments/research projects.

Less than thirty students (27 or 34.2%) cite 20% to 40% of the e-books in their assignments. Again, the majority (19 or 43.2%) of them are among those who have used e-books for writing their assignments or research projects. It is not encouraging to see that only 7 (8.9%) of the e-book users cite more than 50% of the e-book data in their writings and the 8 (10.1%) students reveal that they do not include any percent of e-book data in their writings. Three (3.7%) of these students are those who use e-books just for leisure reading. This scenario indicates that students may use e-books but not necessarily cite them in their works. Secondly, it may be due to the fact that students are lack of information skills such as knowledge

on how to cite electronic sources used in their writings. Moreover, the number of e-books available in the library is still limited and most often not the prescribed text for the undergraduate courses.

Table 4.26: Percentages of E-Book Data Students Included In Their Works (n=79).

Primary purpose of using the e-books		Percentage of e-book data cited in students' works				Total
		None	< 10%	20-40%	> 50%	
For assignments/research projects	Count	1	18	19	6	44
	% within Row	2.3%	40.9%	43.2%	13.6%	100.0%
For reference	Count	2	19	4	-	25
	% within Row	8.0%	76.0%	16.0%	-	100.0%
For leisure reading	Count	3	-	1	1	5
	% within Row	60.0%	-	20.0%	20.0%	100.0%
For browsing (e.g scan table of content)	Count	1	-	2	-	3
	% within Row	33.3%	-	66.7%	-	100.0%
Other purposes	Count	1	-	1	-	2
	% within Row	50.0%	-	50.0%	-	100.0%
Total	Count	8	37	27	7	79
	% within Row	10.1%	46.8%	34.2%	8.9%	100.0%

4.4.7 Willingness to Recommend Using an E-Book to Colleagues or Friends

It is interesting to know that students are willing to recommend using an e-book to their colleagues or friends through question 26. Table 4.27 displays very positive results as majority of students who use e-books before are willing to recommend using an e-book to their colleagues or friends. A total of 72 (88.9%) students answer “Yes”, 8 (9.9%) answer “not sure”, none students answer “No” and one (1.2%) student does not answer the question.

Table 4.27: Would You Recommend Using An-Book to You Colleagues/Friends? (n=81).

Responses	Count	%
Yes	72	88.9
Not sure	8	9.9
No answer	1	1.2
Total	81	100.0

4.5 Reasons For Non-Usage

It is importance to investigate reasons that discourage non-users from using e-books service and their willingness to use e-books in the future. Part D of the questionnaire requests this information and the data collected are present in the section that follows.

4.5.1 Reasons for Not Using E-Books

Question 27 is designed to acquire reasons that hinder students from using e-books service. A total of 57 (45.6%) students reveal that they prefer paper format as the most important reason for not using the e-books (Table 4.28). “Little knowledge on how to use or access e-books” takes the second place as it is chosen by 44 (35.2%) students as their rationale for not using e-books. This is followed by “inconvenient”, which is voted by 35 (28.0%) students as a factor for not using the e-books. About 24.8% or 31 students opt for “My computer does not has Internet connection” as their excuse for staying away from e-books service. A total of 28 (22.4%) check “Difficult to browse and read”, 22 (17.6%) check “No interest” and 12 (9.6%) check “Need special software” as reasons for them for not using e-books. Two (1.6%) students check “other reasons”, such as “Can find enough information

via the Internet” and “Lack of promotion by the library”. The remaining two (1.6%) students do not answer the question.

Table 4.28: Reasons for Not Using E-Books (n=125).

Reasons	Count	%
Prefer paper books	57	45.6
Little knowledge on how to use or access e-books	44	35.2
Inconvenient	35	28.0
My computer does not has Internet connection	31	24.8
Difficult to browse and read	28	22.4
No interest	22	17.6
Need special software	12	9.6
Other reasons	2	1.6
No answer given	2	1.6

Note: Students are permitted to give more than one answers.

4.5.2 Willingness to Use e-books in the Future

When asked whether the students are willing to use e-books in the future, only the minority of students who has never used e-books before give positive responses. As shown in Table 4.29, only 38 (30.4%) students answer affirmatively “Yes” that they are willing to use e-book service in the future. However, a total of 76 (60.8%) students answer “probably”, 2 (1.6%) students answer “probably not” and 8 (6.4%) students do not sure whether they will use e-books in the future. However, one (0.8%) student does not reveal his response.

Table 4.29: Would You be Willing to Use E-Book in the Future? (n=125).

Responses	Count	%
Probably	76	60.8
Yes	38	30.4
Not sure	8	6.4
Probably not	2	1.6
No answer given	1	0.8
Total	125	100.0

4.6 Students' Preference of an E-Book to a Printed Book

Questions 29, 30 and 31 in Part E of the questionnaire are particularly designed to enquire about students' preference between e-books and printed books for reading a textbook and reference book. The data is presented in the section that follows.

4.6.1 Preferred Format for Reading a Textbook

In question 29, students are asked if they have a choice between electronic and print format, which format would they prefer to read a textbook. The results show that majority of students indicate that they prefer to read a textbook in print format than electronic format (Table 4.30). The data reveals that a total of 167 (81.5%) students opt for "print format" and just 38 (18.5%) students opt for "electronic format".

Cross tabulation of preferred format for reading a textbook and use of e-books in the past is also shown in Table 4.30. A total of 108 (86.4%) students who have never used e-books prior to the survey consider the print format as their most favourable format for reading a textbook. Surprisingly, more than half of students (59

or 73.8%) who had used e-books before the survey also prefer to read their textbooks in the print format. On the other hand, 21(26.3%) students who have tried e-books in the past prefer to read electronic textbooks.

Table 4.30: Preferred Format for Reading a Textbook and Past Usage of E-Books (n=205).

Preferred format for reading a textbook		Used e-book in the past		Total
		No	Yes	
Print format	Count	108	59	167
	Expected Count	101.8	65.2	167.0
	% within Column	86.4%	73.8%	81.5%
Electronic format	Count	17	21	38
	Expected Count	23.2	14.8	38.0
	% within Column	13.6%	26.3%	18.5%
Total	Count	125	80	205
	Expected Count	125.0	80.0	205.0
	% within Column	100.0%	100.0%	100.0%

$$x^2 = 5.169, df1, p < 0.05$$

The Chi-square test of independence indicates that there is a highly significant relationship between the use of e-books in the past and the preference of format for reading a textbook. This is shown by the observed significance level (p) for the Pearson Chi-square value of 5.169 with 1 degree of freedom is 0.023, which is less than alpha level of significance of 0.05. The finding reveals that the past usage of e-books may have an effect on the preference of format for reading a textbook. Thus, it can be concluded that e-books users may prefer to read online textbooks as compared to the non e-books users.

4.6.2 Preferred Format for Reading a Reference Book

In question 30, students are asked to indicate which format they would prefer to read a reference book. The choices provided by the questionnaire are “print format” and “electronic format”. Reference book refers to a work that contains miscellaneous facts and information in print or online format, which is normally not read from cover to cover. These include manuals, dictionaries, encyclopedias, almanacs, handbooks, yearbooks, bibliographies, biographies, directories, indexes and abstracts.

Table 4.31 indicates that more than fifty percent of the students who (118 or 57.6%) prefer to refer to a reference book in an electronic format. Users and non-users of e-books seem to show similar preference for the electronic version of reference books. A total of 60 (75.0%) users of e-books and 58 (46.4%) non-users indicate their preference for electronic format.

On the other hand, the remaining 87 (42.4%) students consider print format as their favourite choice when reading a reference book. Detail analysis from the table shows that 67 (53.6%) students are those who have never used e-book in the past and 20 (25.0%) students who have used e-books in the past state similar preference for using print format when reading the reference books. Only one student does not response to this question. Again, it appears that the students’ choice of format for reading a reference book is related with the past usage of e-books.

Table 4.31: Preferred Format for Reading a Reference Book and Past Usage of E-Book (n=205).

Preferred format for reading a reference book		Used e-book in the past		Total
		No	Yes	
Print format	Count	67	20	87
	Expected Count	53.0	34.0	87.0
	% within Column	53.6%	25.0%	42.4%
Electronic format	Count	58	60	118
	Expected Count	72.0	46.0	118.0
	% within Column	46.4%	75.0%	57.6%
Total	Count	125	80	205
	Expected Count	125.0	80.0	205.0
	% within Column	100.0%	100.0%	100.0%

$$x^2 = 16.334, df1, p < 0.01$$

The relationship between preferred format for reading a reference book and past usage of e-books is analysed by using the Chi-square test. The observed significance level (p) for the Pearson Chi-square value of 16.334 with 1 degree of freedom is less than 0.0005. Thus indicates that, there is a significant relationship between the use of e-books in the past and the preference of format for reading a reference book.

Cross tabulation of preferred format for reading a textbook and reference book is shown in Table 4.32. The table reveals that almost half of the students (83 or 49.7%) who consider the print format as their most favourable format for reading a textbook also prefer to read printed reference book. Another half of students (84 or 50.3%) who prefer to read printed textbook indicate preference for reading electronic reference books.

However, only a small number of students (4 or 10.5%) who prefer to read electronic textbook, prefer to read reference books in the print format. Relatively, more students (34 or 89.5%) who prefer to read electronic textbooks clearly indicate their preference for reading the reference books in the similar format. Generally, the findings reveal that many students prefer to refer reference books in the electronic format than in the print format. However, the students' choices of format for reading a reference book may be related to their choices in reading a textbook.

Table 4.32: Preferred Format for Reading a Reference Material (n=205).

Preferred format for reading a reference material		Preferred format for reading a textbook		Total
		Print format	Electronic format	
Print format	Count	83	4	87
	Expected Count	70.9	16.1	87.0
	% within Column	49.7%	10.5%	42.4%
Electronic format	Count	84	34	118
	Expected Count	96.1	21.9	118.0
	% within Column	50.3%	89.5%	57.6%
Total	Count	167	38	205
	Expected Count	167.0	38.0	205.0
	% within Column	100.0%	100.0%	100.0%

$$\chi^2 = 16.447, df1, p < 0.01$$

Based on the observed significance level (p) for the Pearson Chi-square value of 16.447 with 1 degree of freedom is less than 0.005, which indicates that there is a significant relationship between the preference of format for reading a textbook and the preference of format for reading a reference book.

4.6.3 Will E-Books Replace the Traditional Printed Books.

Table 4.33 presents the responses of the students when they are asked to foresee whether e-books would replace the traditional printed books. More than half of the students (108 or 52.7%) believe that e-books would never replace the traditional printed books. Among of them 37 (46.3%) students have used e-books before and 71 (56.8%) are non-users. Less than thirty per cent of students (47 or 22.9%) express their confidence that e-books would replace the existence of paper books. Those who answer in the affirmative “Yes” are among 28 (35.0%) e-book users and 19 (15.2%) non-users. However, 50 (24.4%) students including 15 (18.8%) users and 35 (28.0%) non-users are uncertain about the future of e-books and print books.

Table 4.33: Opinion on E-Books Replacing the Printed Books (n=206).

Will e-books replace the traditional printed books		Used e-book in the past		Total
		No	Yes	
No	Count	71	37	108
	Expected Count	65.9	42.1	108.0
	% within Column	56.8%	46.3%	52.7%
Yes	Count	19	28	47
	Expected Count	28.7	18.3	47.0
	% within Column	15.2%	35.0%	22.9%
Uncertain	Count	35	15	50
	Expected Count	30.5	19.5	50.0
	% within Column	28.0%	18.8%	24.4%
Total	Count	125	80	205
	Expected Count	125.0	80.0	205.0
	% within Column	100.0%	100.0%	100.0%

4.7 How Staff and Librarians Can Improve the E-Books Service at the Um Library

Question 32 is designed to gather suggestions from students on how staff and librarians could improve the e-books service at the UM Library. Several suggestions are given and there are listed in Table 4.34. Out of the 206 students, 100 (48.%) students consider “motivate library users to try e-books” as the most effective method to improve the e-books service at the UM Library. Ninety-nine (48.0%) students urged the staff and librarians of the UM Library to provide specific instruction on how to use or access e-books via the UM Library web site.

Table 4.34: Students’ Suggestions on Improving the E-books Service at the UM Library (n=206).

Suggestions	Count	%
Motivate library users to try e-books	100	48.5
Provide specific instruction on how to use/access e-books via the UM Library web site	99	48.0
Advertise/promote new e-book titles on the UM Library web site	89	43.2
Include e-books' titles in library catalog/OPAC	83	40.2
Provide specific workshops on 'How to use e-book services'	54	26.2
Others	5	2.4
No answer	3	1.4

Note: Students are permitted to give more than one answers.

A large number of students (89 or 43.2%) agree that the UM Library should advertise or promote new e-book titles on the UM Library web site and 83 (40.2%) students propose the UM Library to include e-books' titles in the library catalogs or OPAC. Only a small number of student (54 or 26.2%) recommend the UM Library to provide specific workshops on 'How to use e-book services'.

4.8 Summary of the Results

In this chapter, the results of data analysis are presented in the descriptive form, tables and figures. First, the background information and profile of the students are described. Then, findings that relates to the study's research questions are presented. The key findings of this study reveal that more than half of the students perceive an e-book as an electronic text or e-text. High responses indicate that students are positive towards e-books service at the UML. Even though, most of them have never used the e-books before the survey and only forty percent of students have used the e-books. Half of the e-book users find that e-books are easy rather than difficult to use. Half of the students use the e-books service occasionally and spend less than three hours a week using the e-books. Computer Science and Information Technology are considered as the most popular subject of e-books among the students. Students use e-books mainly for assignments/research projects and references. Majority of the students use e-books because they are available online and provide faster and easy access to new titles. Preference for paper format is indicate as the main factor that discourages non-users from using e-books. Students highlight that the UM Library staff and librarians should motivate library users to try e-books as method to improve the usage of e-books.

CHAPTER FIVE

SUMMARY AND CONCLUSIONS

5.1 Introduction

This study explores the possible factors that might be related to students' perception and usage pattern of electronic books (e-books). It focuses on identifying the place and situations where students access e-books, their reasons for use or non-use, and their preference of using an e-book to printed book. This chapter summarises how the study was carried out, the findings and discusses the results of the research with comparisons made to previous findings. This chapter concludes with some implications of the findings and some suggestions and recommendations to promote further research.

5.2 Outline of the Study

The main objective of the study is to examine the possible factors that might be related to the perception and usage pattern of e-books among Information Technology (IT) students. The research also aims at finding out the e-books' usage patterns especially on how, when, where and why the students use or not use the e-books. The study also attempts to identify the students' preference of using an e-book to printed book.

The research questions are formulated to answer the research problem based on the research objectives. This exploratory study employs the descriptive survey method and uses the questionnaire as the data collection instrument. The sample comprises of 250 undergraduates from the programme of Bachelor of Computer

Science (BCS) and the Bachelor of Information Technology (BIT) in the Faculty of Computer Science and Information Technology (FCSIT), University of Malaya (UM) who are selected based on the stratified random sampling technique.

The students are given a questionnaire enquiring about their demographic background, their perception towards e-books, their e-books usage, their reasons for using and not using e-books and their preference of e-book or print book. The response rate is 82.4%. Out of the 250 set of questionnaires sent out, 206 are returned. The data collected are analysed using Statistical Package for Social Science (SPSS) Version 11.0 for Windows. The analysed data in form of frequencies, percentages and chi-square are then presented in descriptive form, tables and figures. In some cases results are tested for significance using the Pearson Chi-Square test (χ^2).

5.3 Discussion of Key Findings

The results of the study are summarised based on the following research questions and several other findings have also emerged.

5.3.1 How are 'electronic book' perceive by students?

The findings reveal that more than 50% of the students identify an e-book as an electronic text (e-text). This is in agreement with the definitions given by Desmarais, 1994; Hawkins, 2000; Saurie and Kaushik, 2001; Ormes, 2002; McKnight & Dearnley, 2003; and Vidana, 2003 who are focusing on the contents (electronic text) of a book made available in an electronic form. Other students (29.6%) relate e-book as the combination of electronic text, e-book reading devices and e-book software. This is parallel with the interpretations expressed by Abrew,

2001; Lynch, 2001; Goh, 2002; and Grant, 2002 who have extended the definition of e-books to include both e-book as e-text and e-readers. However, very few students associate e-books as e-book software (4.9%), e-book reader (3.9%) and 3.9% indicate they do not know what an e-book is.

5.3.2 What are students' perception towards the e-books service at the University of Malaya Library (UML)?

There is positive acceptance of e-books among the students. Most of the students are positive (70.0%) and very positive (8.3%) towards the e-books service at the University of Malaya Library (UML). The reasons given by them are generally related to several e-books' values such as the availability (52.7%), enticing (16.7%), handling (16.7%) and cost (13.0%). The results were similar with the findings of Ambikapathi (1999) on the information seeking behaviour of trainee teachers, which stated accessibility as the most important criterion for choosing an information source while cost was found to be the least important factor. Moreover, time availability was seen as one of the primary issues surrounding the use of Internet and electronic resources rather than traditional library resources (Rice, 2003).

Students discover that the UML subscribed to e-books via the UML web site (50.0%), lecturers (17.5%), colleagues or friends (12.6%), librarians (13.1%) and UML brochures and pamphlets (2.9%). Thus, the results show that library web site provides the most effective method to get users to the e-books service.

5.3.3 What is the student's impression of using the e-books?

The findings reveal that the majority of students (60.7%) have not used the e-books before the survey and only 39.3% students have previously used the e-books.

This corresponds with the findings of Chu (2003) who reported that only a minority (33.3%) has used e-books in the past. Similarly, Bodomo...et al (2003) also revealed that 60% of respondents never used e-books in the past 3 months. This study has also disclosed that there is no significant relationship between the use of e-books and gender. More male students (44.7%) use e-books than female students (34.8%). Relatively, more female students (65.2%) do not use e-books than male students (55.3%).

The results reveal that e-book users spend more than seven hours (50.0%), five to six hours (26.3%) and less than an hour (2.5%) a week on online accessing Internet. It shows that, more percentage of e-books users are among the heavy users of Internet. However, the chi-square test indicates that the hours spend on accessing the Internet per week has no influence on the use of e-books ($p= 0.371$).

Most of the e-book users find that e-books are easy to use. Out of 81 students, half of them indicate e-books “quite easy” (50.6%), “easy” (21.0%) and “very easy” (6.2%) to access. On the other hand, about 14.8% users find it “not very easy” and “not all easy” (6.2%) to use.

5.3.4 What is the gateway use by the students to access the e-books?

More than half of e-book users (65.4%) indicate that UM Library web site as the most favourable pathway to access E-books compare to UM Library web site and other libraries' web sites (12.3%), other free webs or homepages (8.6%), UM Library web site and other free webs or homepages (7.4%) and other libraries' web sites (3.7%). The high use of the UM Library web site as favourite gateway to access e-books compared to other channels is expected as the library homepage offers

unlimited access to library collections, from anywhere with an Internet connection, 24 hours a day and seven days a week (outside library hours).

Generally, the majority of e-book users (82.7%) indicate that they prefer to read the full chapter(s) or page(s) of e-books on the computer screens than print format (16.0%). The results therefore reveal that students who have positive impression of using an e-book would prefer to read e-books via the computer screen. This corresponds with Monopoli...et al. (2002) who reported that more than two third of the respondents (69.5%) in the University of Patras, Greece, considered the electronic version as the most favourable method of reading a journal article.

5.3.5 Where do the students most access the e-books?

This study reveals that the Faculty's computer labs are considered as the most popular place (55.6%) to access e-books compare to other places such as home (24.7%) and UML (16.0%). Thus we may conclude that students are taking advantage from the free and fast Internet access provided by the faculty for the convenience of its students.

However, a large number of students use the e-books service "occasionally" (56.8%) than on weekly (21.0%) or monthly basis (19.8%). This indicates that students are not fully utilised the service. This scenario may be due to the lack of needs to access the e-books daily, after all use will only be affected by needs. Therefore, librarians and lecturers should encourage students to refer e-books as their reading and reference sources. Results also indicate that differences in frequency of e-books use are significant when related with differences in gender ($p = 0.016$). This is parallel with the findings of Monopoli...et al. (2002) who discovered that more males used the e-journal services on a daily, weekly or monthly basis than females.

5.3.6 How frequently the students access the e-books?

The results reveal that 43.2% of students spend 1-2 hours a week using the e-books. Others spend for 3-4 hours (27.2%), less than an hour (25.9%), 5-6 hours (2.5%) and more than 7 hours (1.2%) per week accessing the e-books service. Students who spend longer hours on the Internet tend to spend longer hours on e-books. This is parallel with the general assumption that the IT related students are more likely to use e-books because of the amount of time they spend on using the Internet.

5.3.7 What are the subjects of e-books most used by students?

Majority of e-books' users (71.6%) indicate that Computer Science and Information Technology as their most favourite subject of e-books compare to "General" subject (23.5%), Health and Medicine (1.2%) and Economics and Business (1.2%). This is similar with the findings by Dillon (2001) who mentioned that the 3 subjects: Computer Science and Information Technology, Health and Medicine and Economics and Business are the areas that e-books received higher use than other subject areas. These fields (science and technology) are attracting readers of e-books as updated information is needed and can readily circulated (UCONNLibraries, 2002).

5.3.8. What is the primary purpose of students using e-books?

The results from this study is in agreement with the findings reported by McCarty (2001) and Guthrie (2002), who found that students use e-books mainly for writing assignments/research projects (54.3%), reference (30.9%), leisure reading (6.2%), and browsing (3.7%). However, the percentage of e-books data that students

include in their works is found to be slightly low. As 46.8% cite less than 10% while 34.2% utilise 20% to 40% and only 8.9% cite more than 50% of the e-book in their writings. The reasons for this scenario may be related to the findings by Pew Internet & American Research Project (2000) that reported 71% of college students used the Internet as their primary source for their most major school projects or reports. The minimal use of e-books in the students' works may also be due to their lack of information skills on how to cite electronic sources used in their writings. Moreover, students are not familiar with the copyright regulations governing digital materials, thus they are not sure to what extent they can make copies of digital resources (Bodomo...et al, 2003).

5.3.9. What are the reasons for using or not using the e-books?

A high percentage of students indicate that that they use e-book because it is available online (64.2%), provides faster and easy access to new titles (45.7%) and do not require physical visit to the library (40.7%). Bodomo...et al (2003) also found that students recognised that digital libraries were very convenient since they did not need to go to libraries and could still read and download books or journals from home. This study also reveals that the students use the e-book because it is convenient (38.3%), easy to access (38.3%), user-friendly (21.0%) and available around the clock (16.0%). Similarly, Chu (2003) also reported that “available around the clock” and “searchable” were valued the most by students at a library and information science schools in the USA.

The findings of this study reveal that almost half (45.6%) of the non-users indicate preference for paper format as a barrier for them from using e-books service.

Holmquist (1997) also discovered that the main reason for not using e-journals was that students preferred to read articles on paper, not on the computer screen. Other students have mentioned factors such as “Little knowledge on how to use or access e-books” (35.2%), “inconvenient” (28.0%), “My computer does not has Internet connection” (24.8%), “Difficult to browse and read” (22.4%), “No interest” (17.6%) and “Need special software” (9.6%). It is obvious that the reasons are not based on their experiences, as they have never used e-books prior to the survey. Utilisation of e-books is expected to rise if they have clear picture about the e-books service. Mercieca (2003) also described that reluctant to use electronic textbooks was due to perceived difficulty in reading electronic text and reluctance to purchase electronic textbooks, but students would consider using them through a library collection but primarily if there was no alternative printed texts.

Responses on the willingness to use e-books in the future indicate a slightly promising hope for the UM Library as 30.4% students answer affirmatively “Yes” that they are willing to use e-books service in the future. This scenario shows that UM Library must play proactive role in promoting the e-books service in order to widen its usage. However, the majority of the students who have used e-books before (88.9%) indicate their willingness to recommend e-books to colleagues or friends who can be potential users of e-books.

5.3.10 What is the student’s preference between e-book and printed book?

The findings reveal that a majority of students (81.1%), both e-book users and non-users indicate highest preference for reading a printed textbook than electronic textbook (18.4%). The finding also reveals that the past usage of e-books has a

significant relationship on the preference of format for reading a textbook ($p=0.023$). Almost 30% of the e-book users prefer to read electronic textbooks, relatively the majority (86.4%) of students who have never used e-books prior to the survey prefer to read printed textbooks. The findings differ from the results obtained by Rogers (2001) who reported that more students in America's colleges (62%) preferred digitised textbooks over standard paper volumes. However, Bodomo...et al (2003) reported that a majority of students (77%) in Hong Kong universities preferred printed materials. Thus corresponds with the general findings that most people are not very comfortable reading large portion of text on a computer screen (Gibbon, 2001).

Generally, more than half of the students (57.3%) prefer to refer a reference book in an electronic format. The past usage of e-books is also found to have a significant relationship on the preference of format for reading a reference book ($p=0.0005$). Users of e-books (75.0%) show highest preference for electronic reference books than the non-e-book users. This is undeniably true, as readers use e-books as reference sources, looking for particular piece of information rather than for reading cover to cover (Long, 2003). Moreover, the additional features of e-books such as ease of browsing with keyword and full text searching capabilities within a book or across a collection of books would enhance usability of reference books like dictionaries, encyclopedias and manuals.

This study also reveals that preference of format for reading a reference book is also related to their choice for reading a textbook ($p=0.0005$). This may be true, as students who prefer to read printed textbook tend to read reference book in the similar format. The results of this study reveal that many users and non-users of e-

books believe that e-books would never replace the traditional printed books. Similarly, Seybold Seminars & Publications (2000) also reported that the majority of publishing professionals did not believe that print would go away anytime soon. Some academic libraries also commented that they felt the role of e-books was not to replace printed materials but to serve as a duplicate copy (Snowhill, 2001). As described by Helfer (2000), the users use e-books just as a reference tool to get the answer they needed and they could or would buy a physical copy of it if they wanted or need the book on an ongoing basis.

5.4 Suggestions on how to improve the e-books service at the UM Library.

One of the primary suggestions proposed by students for utilisation of the e-books service is that the UM Library staff and librarians should encourage library users to try e-books. Also, they recommend that the UM Library should provide specific instruction on how to use or access e-books via the UM Library web site, advertise new e-book titles on the UM Library web site, include e-books' titles in the library catalogs or OPAC and provide specific workshops on 'How to use e-book services'. This is accordance with the experiences of the University of Rochester libraries, where they strongly suggest that inclusion of the e-book titles within a library's catalog is directly tied to a high increase in use of the collection (Gibbon, 2001).

5.5 Theoretical framework

Based on the research findings, the researcher has developed a general theoretical framework, which is intended to serve as a tool for readers, researchers and

information providers and services (IPS) to understand the use of electronic books among library users better. This theoretical framework (Figure 5.1) illustrates the main findings of the study on the perception and usage pattern of electronic books among Information Technology (IT) students. It identifies the several factors that are related to the use and non-use of e-books.

a) Users of E-book

The starting point of the framework is that to understand the students' usage pattern of e-books. Generally, only a minority (39.3%) of undergraduate students has used e-books in the past and their genders have no significant influence on the use of e-books. With respect to frequency, a large number of students (56.8%) use the e-books service occasionally than on weekly (21.0%) or monthly basis (19.8%). Results also reveal that more males used the e-book services more often than females. Moreover, many of students (43.2%) spend only 1-2 hours a week using the e-books. This indicates that students have not fully utilised the service.

About subject of e-books used by most by IT students, results indicate that Computer Science and Information Technology is more popular than other subject areas such as Health and Medicine and Economics, Business and General subject.

Users use e-books mainly for writing assignments/research projects (54.3%), reference (30.9%), leisure reading (6.2%), and browsing (3.7%). However, the percentage of e-books data that they include in their works is found to be slightly low. As 46.8% cite less than 10% while 34.2% utilise 20% to 40% and only 8.9% cite more than 50% of the e-book in their writings. The minimal use of e-books in the

students' works may also be due to their lack of information skills on how to cite electronic sources used in their writings.

Perhaps, by understanding when and why students use e-books, it will help information and service providers decide which types and titles of e-books that most suitable to their users' information needs. However, there are many factors that might be influenced a student to use or not using the e-books service. The four identified factors are technology competencies, cognitive factors, access factors and functional factors. These four factors are described in the following sections.

b) Technology Competencies

Generally, computer and technology competencies are essential in using any kind of electronic resources and services. Thus, use of e-books may be influenced by factors relating to the IT competency. Surprisingly, the results reveal that IT related students also demonstrate minimal uses of e-books. A high percentage of students (60.7%) have indicated that they have not used the e-books before the survey. This is contradicted with the general assumptions that students who are competent in using computers and Internet are more likely to use e-books services compared to Art students.

Moreover, this study reveal that the hours spend on accessing the Internet per week has no influence on the use of e-books. This indicates that e-book users are not restricted among the heavy users of Internet. This research has shown that non-users are not encourage to use e-books service because its needs additional or special software (9.6%), require Internet connection (24.8%) and difficult to browse and read

(22.4%). It is obvious that these problems could be overcome if they are computer and technology literate.

c) Cognitive Factors

Cognitive factors refer to student's knowledge, perception, impression and attitude toward e-books. The findings reveal that more than 50% of the students identify an e-book as an electronic text (e-text). This is true as the UM Library provide web-based e-books including ebrary.com and Books24x7.com. However, 3.9% of students indicate that they do not know what an e-book is. Therefore, a clear picture of what is actually an e-book is important in attracting user to use the service, as there are many types and formats of e-books available for users in the market.

The results show that library web site (50.0%), provides the most effective method to inform users about the availability of e-books service at the UML, compare with other sources such as lecturers (17.5%), colleagues or friends (12.6%), librarians (13.1%) and UML brochures and pamphlets (2.9%). The right channels chosen by a library to market e-books service is therefore vital, as everybody should be made aware of the service and develop an awareness of how the e-books can be accessed and used.

It should be noted that user reactions toward e-book services and awareness of a library service might have an effect on the uses of the service. This is because different user communities have different perception on the importance and usefulness of these services. This study reveals positive acceptance of e-books among the students. The reasons given by them are generally related to several e-books' values such as the availability (52.7%), enticing (16.7%), handling (16.7%)

and cost (13.0%). Moreover, most of the e-book users find e-books are easy (77.8%) rather than difficult to use (21.0%). In contrast, factors such as little knowledge on how to use or access e-books (35.2%) and no interest (17.6%) are considered as barriers for the non-users from using e-books service.

d) Access Factors

Access factors refer to the means or gateways users prefer to access the e-books and places where users conduct their searches on the e-books service. The University of Malaya (UM) Library web site (65.4%) is considered as the most favourable gateway to access e-books compare to other libraries' web sites (12.3%), free webs or homepages (8.6%). Faculty's computer labs (55.6%) and homes (24.7%) are considered as the most popular access places by e-book users than the UM library (16.0%). Thus indicate, majority of e-book users are among the remote library users.

Findings of this research has shown that users access e-book because it is available online (64.2%), provides faster and easy access to new titles (45.7%), do not require physical visit to the library (40.7%) and available around the clock (16.0%). On the other hand, the non-users consider reasons including no Internet connection and no required software as barriers for accessing the e-books.

e) Functional Factors

Functional factors can be important influence, especially when users need information that is practical and useful for them. Generally, this study reveals that students use the e-book because it is convenient (38.3%), easy to access (38.3%) and user-friendly (21.0%).

Preference of format for reading a textbook and reference book also play a very important role on the use of e-books. Results reveal that students prefer to read printed textbooks but electronic reference books. The past usage of e-books determines the students' choice of format for reading a textbook and reference book. Many e-book users prefer to read electronic textbooks, but the majority of non-users prefer to read printed textbooks. Preference of format for reading a reference book is related to their choice for reading a textbook. This study also reveal that preference for paper format is seen as the most important reason for not using e-books service compare to other reasons

Thus, by understanding this framework, readers can have general insight on the most important findings of this research project. This framework can serve as an effective model for readers, researchers, information and service providers and policy makers to look for better ways to understand the e-books' usage pattern among library users and address many of the library user-services related problems. This model is also useful for those who are interested in redesigning and replicating this research for further improvements.

5.6 Implications

The findings of this study have highlighted some aspects of e-books usage among undergraduates. These should be given priority in ensuring further usage of the service. This study showed that students perceived e-books differently. Some students referred an e-book solely on the content of the e-books (i.e electronic text or e-text). Others associated e-books as the combination of the content (e-text), hardware (e-book reading devices) and software (special software use to read e-

books). Both interpretations are accepted since there is no standard definition for it. Therefore, this issue should be addressed globally in order to standardise the definition of 'e-book'. As proposed by Henke (2002), the "eBook industry" must reinforce the message that electronic books are 'content' and 'dedicated readings devices' are tools that enhance the person's reading experience of electronic books.

The results of this research revealed that the use of e-book among students from the Faculty of Computer Science and Information Technology (FCSIT) in University of Malaya is low. This is not satisfactory and especially alarming as the students who have good computer literacy and better exposure to current Information Technology (IT) applications do not fully utilise the service. This is contradictory to the general assumption that IT related students are more likely to use e-books services compared to Arts students. Therefore, it is obvious that the use of e-books is depending on users' needs.

Moreover, a large number of students used e-books on an occasional basis than on regular basis. This suggests that the UM Library should take remedial actions proactively and effectively to encourage users, potential users and non-users to fully utilize the service, as anyone who reads a book is a potential reader of an electronic book (Henke, 2002). Marketing is therefore vital, as people will not use e-book collections if they do not know they exist or they cannot see the purposes of using them. E-books should be linked to, integrated with, existing collections rather than simply bolted on if usage is to be maximized and costs justified (Garrod, 2003).

This study showed that half of the students discovered about the availability of e-books service via the UM Library web site and most of them used the UM Library web site as their main gateway to access e-books. This implies that the e-book users are among the remote library users. Only a few of them were notified about the availability of e-books service by their lecturers, colleagues or friends, librarians and UML's brochures and pamphlets. This implies that the library web site can be the most effective channel to promote and create awareness about the availability of e-books service to users. However, librarians, lecturers and students may also play proactive role in encouraging other students to use e-books.

The findings revealed that the percentage of e-books data that students included in their works was found to be slightly low, even though many of them indicated that they used e-books mainly for writing assignments/research projects and reference. Therefore, the content of the information skill courses should include topics on the use of e-book features, the usefulness of e-books, skills on how to cite sources including electronic materials and the copyright regulations governing electronic resources to improve the users' knowledge in using electronic materials and influence their perceptions of the services. As suggested by Wei (2003), the level of use is influenced heavily by users' perceived importance of the service, their satisfaction with the services, and their familiarity with the library and its resources. Thus, the more important the service is perceived, the more likely it is that users will use this service in the future.

On the 81 non-e-book users, the most common reasons cited were preference for paper format and lack of knowledge on its use. This implies that effective training is needed to improve the knowledge of users on how to fully utilise the e-books service. Through training they would see the benefits they could derive from using them. Scollin (2000) also stated that:

“Lack of training, not having access or technical support and time to learn to use were key factors in ones’ decision not to use an online resources.”

To achieve this McCarty (2001) insisted that librarians should take the time to familiarise themselves with electronic books so they can better serve the patrons and enjoy the useful features of this new technology.

This study also revealed that a majority of students indicated highest preference for reading a printed textbook than electronic version. This implies that many students are not comfortable reading a text on the computer screen. As highlighted by Mercieca (2003):

“The current trends suggest that students would prefer to use these collections as an electronic distribution process. That is, they want to use electronic textbook collection in a similar manner for the actual journal collection, search digitally and then produce a printed copy for the actual reading.”

Therefore, it would be ideal if the e-book models would provide users with the ability to print, download and copy certain page(s) of e-book from their personal computers

within copyright laws. This also implies that students use textbooks more than academic staff, therefore library must market the service to the students and selection of e-books should reflect their needs. Librarians should encourage greater involvement of lecturers in e-books selection as the content or title of e-books need to be related closely to the curriculum and students' reading lists.

Since the findings indicated that a majority of the students preferred to refer a reference book in an electronic format, there should be more expansion of future e-books collection on reference materials such as more online programming manuals, handbooks, thesauri, encyclopedias and dictionaries.

One of the suggestions given by the students for utilisation of the e-books service is that the UM Library staff and librarians should encourage library users to try e-books. Also, they recommend the UM Library to provide specific instruction on how to use or access e-books via the UM Library web site. Perhaps an online tutorial may be useful for the students as there are among remote users which are more independent and do not need intermediaries. Library should also incorporate the e-books' titles in the library catalogs or OPAC to make users aware about the resources. As suggested by the University of Rochester libraries, inclusion of the e-book titles within a library's catalog is directly tied to a high increase in use of the collection (Gibbon, 2001).

5.7 Recommendations

This study provides some information on the use of e-books among IT related undergraduates at an academic library in Malaysia. It was evident that the level of e-book uses among the students was very limited. The reasons for this are closely related to preference of paper format and lack of knowledge on its use. Based on this, it is highly recommended that libraries must develop relevant e-book collections based on the users' needs and continue promotion activities to market e-book collection in order to create and encourage awareness among students on e-books service.

It is proposed that the selection of e-book titles should be tailored closely to the students information needs such as by providing more up to date and relevant titles based on textbooks and reading lists. Further, the libraries should emphasise on developing the reference collection since the majority of the students preferred to refer a reference book in an electronic format. Therefore, it is proposed that in the future libraries would consider subscription of relevant reference databases such as xReferplus.

Since the majority of e-book users are among the remote library users, promotion and training should be made accessible online via the library websites. Online help guides and Frequently Asked Questions (FAQ) about e-books and other online services should be accessible online and off line via the library web sites to allow easy access for all level of users. Library should also develop special links via the library web sites on library trainings sessions or workshops. Despite this, libraries may also announce information about new library services and resources through the library newsletters or university newsletters.

In order to become an effective instructor and intermediary for users, librarians should fully understand about the e-books service and always keep abreast of rapidly changing e-book technology. Therefore, the libraries should determine the required continuing education and training topics and provide more relevant practical courses for librarians. It is also strongly suggested that librarians must understand the users information needs in order to provide relevant services for them. There are many ways librarians could trace the users' information needs such as by conducting surveys or ask for detail profiles via the library registration form. These may be practiced manually or electronically through library web site or users' e-mail addresses.

In order to encourage remote library users to use the electronic resources to satisfy their information needs, library should incorporate the library catalog together with web-based resources such as electronic journals, electronic books, web pages, images and full text resources. By doing this, users are given the opportunity to search and retrieve relevant web-based resources through the web-based catalogs. This is because the catalog has always been the gateway to accessing the library resources regardless of formats (Curtis, 2002).

Due to the invaluable values of information on the use of e-books, more research should undertake to further investigate in relation to e-book uses. Future studies aim in this direction is suggested in the following paragraphs.

This study investigated the possible factors that might be linked to the use of e-books among undergraduates. It was based on a sample of 206 students drawn from the Faculty of Computer Science and Information Technology. The research may be replicated to investigate students of the same level of study and upper level of study

from the same fields at different local universities. The study may also be carried out among undergraduates and postgraduates from different faculties such as Arts, Economics and Businesses, Health and Science. It would be interesting to compare the similarities and differences between the different groups of students.

The reasons for use and non-use have not been clearly expressed by the respondents. Further study can be conducted by using different techniques such as interviews to obtain more detailed and elaborate responses.

This study did not focus on investigating the features of e-books by specific e-book databases. Therefore, further study can be carried out to obtain more detailed information on the features of e-books that user value most by different databases such as ebrary, NetLibrary and books24x7 and xReferplus. This will help to provide more insights on the overall pattern of use as a whole and compare the similarities and differences between the databases.

The user-studies on the use of electronic services and resources always remain one of the most popular topics among librarians and researchers. Such knowledge is useful in the field of librarianships and information studies as users information needs and their information seeking behaviour are often changing. Thus, it would be interesting to ascertain the similarities and variances between the usage patterns of e-books and other online services such as electronic journals, full text databases and Internet (web pages).

Due to limitation of time and cost, this study did not touch on the provision issues of e-books service at the University of Malaya library. As a result, no relevant information on the aspects of e-books provision such as cataloguing, circulation, access, cost, staff trainings and maintenance of e-book service could be collected.

Therefore, more research needs to be carried out on these issues at the University of Malaya library and other local libraries regardless of its types.

5.8 Conclusion

The purpose of this study was to investigate the possible factors that might be related to the use of e-books by undergraduates. The study was conducted at the Faculty of Computer Science and Information Technology, University of Malaya and two hundred and six undergraduates participated in the study.

This study has provided some information on the use of e-books among undergraduate students in an academic library in Malaysia. It has shown that there was positive acceptance of e-books among IT related students, although the used of e-books was still limited. Majority of e-book users were among the remote library users as majority of them accessed e-books via the library web site from the faculty's computer labs or homes. Computer Science and Information Technology were quoted as the most popular subjects of e-books compare to General, Health and Medicine and Economics and Business. Generally, IT students used e-books mainly for writing their assignments/research projects and reference.

The findings also generalised some factors that encouraged the IT students to use e-books such as technology competencies, cognitive factors, access factors and functional factors. Most users preferred to read the e-books on the computer screen than print format. Preference for paper format and little knowledge on how to use or access e-books were identified as the main factors that hindered non-users from using e-books service.

Parallel with findings of the earlier studies, the students indicated highest preference for reading a textbook in print version than electronic version. However, most of them preferred to refer a reference book in an electronic format. Implications of the findings were then discussed. Recommendations for positive actions to be taken by library and librarians were also suggested. Suggestions for more in-depth researches for future studies have been proposed.

It is hoped that the study will contribute positively to the development of e-books service in the local libraries. Hopefully, the findings could provide relevant information to librarians and researchers in the field of librarianships and information science in order to identify ways of improving the services in the future and provide guidelines for comparison, for other libraries across the country, which may consider providing e-books service in the future.

