

## Factors Related to E-books Use amongst IT Students

Roesnita Ismail<sup>1</sup> and A.N. Zainab<sup>2</sup>

<sup>1</sup> Faculty of Science & Technology, Islamic Science Universiti Malaysia, Bandar Baru Nilai, 78000, Nilai Negeri Sembilan, Malaysia

<sup>2</sup> Library and Information Unit, Faculty of Computer Science & Information Technology, University of Malaya, 50603 Kuala Lumpur, Malaysia  
e-mail: roesnita@yahoo.com; zainab@um.edu.my

### Abstract

*This paper describes a case study, which looks at the use of e-books among Information Technology (IT) undergraduates at an academic library in Malaysia. The study aims to investigate on the usage of e-books among IT students and identifies the possible factors that might lead to their use or non-use. It focuses on identifying the places 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. The study employs questionnaire as the data collection instrument. The findings are based on a total of 206 returned questionnaires from IT students who were selected based on programmes and semesters using the stratified random sampling technique. The results revealed that there was positive acceptance of e-books among IT students, even though the level of e-book uses was low (39%). The students became aware of e-book service mainly while visiting the Library website, or were referred to it by their lecturers, friends or the librarians. About 70% rated positively on the e-book service. Users indicated e-books were easy to use, while non-users preferred the printed text and professed lack of knowledge on its use. Generally, both users and non-users of e-books preferred to use the printed version of textbooks especially if the text was continuously used. The majority preferred to use e-versions of reference sources. There were significant difference between past usage of e-books and preference for electronic textbooks and reference books. The student's use or non-use of e-books was greatly influenced by a number of interacting variables, which comprise their ICT competencies, their cognitive makeup, the degree of user access to the e-books and the functional or use factors.*

**Keywords:** e-Book; Electronic book; E-book use study; User study; Academic Library; Malaysia.

### 1. Introduction

There are a variety of definitions of e-books in the literature. Anuradha and Usha (2006) noted that how an e-book is defined is based on either its form or content or mode of access or the devices used for reading them. Some defined e-book as text or document or file format of e-book such as Word's .doc, txt, HTML or XML (Hawkins, 2000; Rao 2005, Ormes, 2002; McKnight and Dearnley, 2003; Vidana, 2003). Other definitions related e-book to the conversion from print into digital form to be read on a computer screen (Saurie and Kaushik, 2001; Desmarais, 1994). Some referred to e-book as both the electronic text as well as the electronic reader device that is required for e-book to be read (Abrew, 2001; Lynch, 2001; Goh, 2002; Grant, 2002). Connaway (2003) defined e-book as a publication that characterized an electronic format, utilizing Internet technology to make it easy to access and use. Rao (2005) referred to e-book content as the intellectual property component, e-book format refers to document or file format, e-book reader refers to software that enables one to read different file format on a variety of hardware types and e-book reading device refers to portable hardware available for reading e-books.

Studies on usage of e-books focused more on investigating the features of e-books that the users valued most (Wearden, 1998; Andersen, 2001; Simon, 2001; and Chu, 2003 and Anuradha and Usha, 2006) and giving little emphasis on where, when, why and purpose of using the e-books. For instance, Simon (2001) investigated how students at Fordham College at Lincoln Center, Manhattan had been using the e-book services. He noted that a majority of students used the glossary lookup (65%) and book marking (55%) features,

while exactly half used highlighting and less than half (40%) used annotated content. In investigating the user preference between the electronic and print format for reading a textbook, many researchers reported clear preference for print format (McKnight, 1997; Ray and Day, 1998; Gibbon, 2001; Guthrie, 2002; McKnight and Dearnley, 2003; Cox, 2004 and Levine-Clark, 2007). In contrast, several studies revealed a higher preference for electronic format when reading reference materials (Rogers, 2001; Monopoli et al., 2002; and Rao, 2003). Seybold (2000) observed that publishing professionals preferred e-versions of reference materials such as manuals, encyclopaedias, maps and travel guides. Long (2003) found that readers would use e-books as reference sources or when looking for a particular piece of information rather than reading from cover to cover.

Several studies on e-book use had reported slow acceptance of e-books in libraries. The University of California library (UCL) in February 2001 surveyed its four campuses and reported that most institutions were still in the trial stage with their e-book subscription. In that year UCL indicated that the acquisition of e-books had little or no impact on their purchase of printed titles. Librarians commented that they felt the role of e-books was not to replace printed text but served as a duplicate copy (Snowhill, 2001). In Great Britain, Lonsdale and Armstrong (2001) indicated slow acceptance of nearly all digital textual resources other than journals. Helfer (2000) indicated that the slow acceptance may be due to users wanting to use e-books just as a reference resource, to look for the answers they want and sent the book back. Users of the SunShine library prefer to buy a copy of a book if they need it on an ongoing basis. Users of NetLibrary subscribed by the Associated Mennonite Biblical Seminary reported negative impression of the e-library among its users, who tended to just check out the database but had not actually read any books. The study also indicated those who actually use the netLibrary gave positive ratings (Saner, 2002).

The reasons for the slow acceptance of e-books vary but a constant reason given was not being comfortable with reading using personal computers, laptops and palm pilots (Helfer, 2000; Andersen, 2001). Other reasons included; finding it difficult to read on small screens, problems with browser crashes, slow loading time, difficulties in navigating (Gibbon, 2001; Chu, 2003); and preferring to read printed text (Ray and Day, 1998; Holmquist, 1997; Gibbon, 2001). Summerfield and Mandel (1999) indicated that library users at the University of Columbia would use e-book in some depth when they are required to do so by courses they are following. Cavanaugh (2004) has indicated four main reasons why students use electronic texts (eBooks) as the course textbooks. These include accessibility to the material, cost of the book, currency of the material and access to materials that are no longer in print or access is prevented due to location of the students. The studies above indicated that the degree of acceptance of e-books is on the rise but the preference for printed text remained.

An increasing number of libraries are making provisions for e-books simply because of decreasing budget, limited shelving space, increasing cost of new building and resources, the high cost of repairs, maintenance and replacements (Mullin, 2002; Connaway, 2003). E-book subscriptions solved libraries' recurrent problems of lost, stolen and damaged books (Ardito, 2000; Connaway, 2003). E-books require no unpacking, labelling and shelving and they require less processing time before they can be used (Grant, 2002; Helfer, 2000). The need to provide e-books is exacerbated by users who are demanding for electronic resources both on site and remotely (McCarty, 2001; Snowhill, 2001).

To handle the high subscription costs, libraries subscribed to e-books through consortiums, which helped reduce the cost of purchasing per title, which would not have been affordable to lone subscriber (Rohde, 2001; O'Leary, 2004). It would have cost over

US\$167,741,000 for 675 libraries participating in the TexShare database programme in to subscribe to the 13,000 e-book collection, which was purchased for under US\$8,000,000 (Ebrary, 2004). This is equivalent to about US\$1.50 per full time equivalent student. This consortium subscription is becoming increasingly common in Malaysia.

As at March 2007, there are 15 (75%) academic libraries of the 20 Malaysian public universities currently provide access to e-books via their library web sites. These include Universiti Malaya (UM), International Islamic University Library (IIUM), Universiti Sains Malaysia (USM), Universiti Utara Malaysia (UUM), Universiti Teknologi Malaysia (UTM), Universiti Teknologi MARA (UiTM), Universiti Putra Malaysia (UPM), Universiti Kebangsaan Malaysia (UKM), Universiti Malaysia Sabah (UMS), Universiti Malaysia Sarawak (UNIMAS), Universiti Pendidikan Sultan Idris (UPSI), Universiti Sains Islam Malaysia (USIM), Universiti Teknikal Malaysia Melaka (UTeM), Universiti Tun Hussein Onn Malaysia (UTHM) and Universiti Malaysia Perlis (UniMAP).

The most popular publishers among these libraries are Ebrary, NetLibrary, Books24x7 and Springer. E-book databases are recent additions to academic libraries in Malaysia and little is known about its use or acceptance amongst educational users. This is similar to other countries, as stated by Lonsdale and Armstrong (2000) cited in Sawyer (2001), who indicated that a preliminary review of the available literature reveals much recent hype, activity and comment but still little study, especially in the area of e-books services as opposed to journals.

## 2. Objectives and Sample Study

This is a case study, which aimed to investigate on the usage of e-books and identify the possible factors that might be related to the use of e-books among Computer Science (CS) and Information Technology (IT) students, University of Malaya. It focused on identifying the student's ability to define e-books, their awareness of the service, their perceived importance of the e-book service at the University of Malaya library, the extent of e-book cited in their assignments, the places 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 study utilized a descriptive survey method and employed questionnaire as the data collection instrument. The students were selected based on stratified random sampling technique based on programmes and semesters. The student sample consisted of 250 undergraduates studying in the second to fifth semesters in the academic year 2002/2003. The students were selected for two reasons (a) they have basic information literacy skills training as they would have attended the Information Skills course in the first semester of their programme; (b) they were considered as ICT literate students and would have little problems in handling the e-book environment; and (c) they are thought to be the more likely user of electronic resources made available over the campus network. Each student was given a self-administered questionnaire as they entered their classrooms, computer laboratories, the faculty foyer, document room or canteen on a "first-come, first served" basis. The findings were based on 206 usable questionnaire returns. The data collected were analysed using Statistical Package for Social Science (SPSS) Version 11.0 for Windows. Suitable variables were tested for significance using the Pearson Chi-Square test ( $\chi^2$ ). The students in this study comprised 94 (46%) male and 112 (54%) females.

## 3. Results and Discussion

The results of the study revealed that students' use of e-book was greatly influenced by a number of interacting variables, which can be grouped into four categories (Figure 1). The use or non-use of e-books are determined by various situations and circumstances,

comprising users' technological competencies, users' cognitive makeup, the level of access to e-books and the types of functions or use made of the e-books. Each situation comprises a number of variables that hinders or deters e-book use.

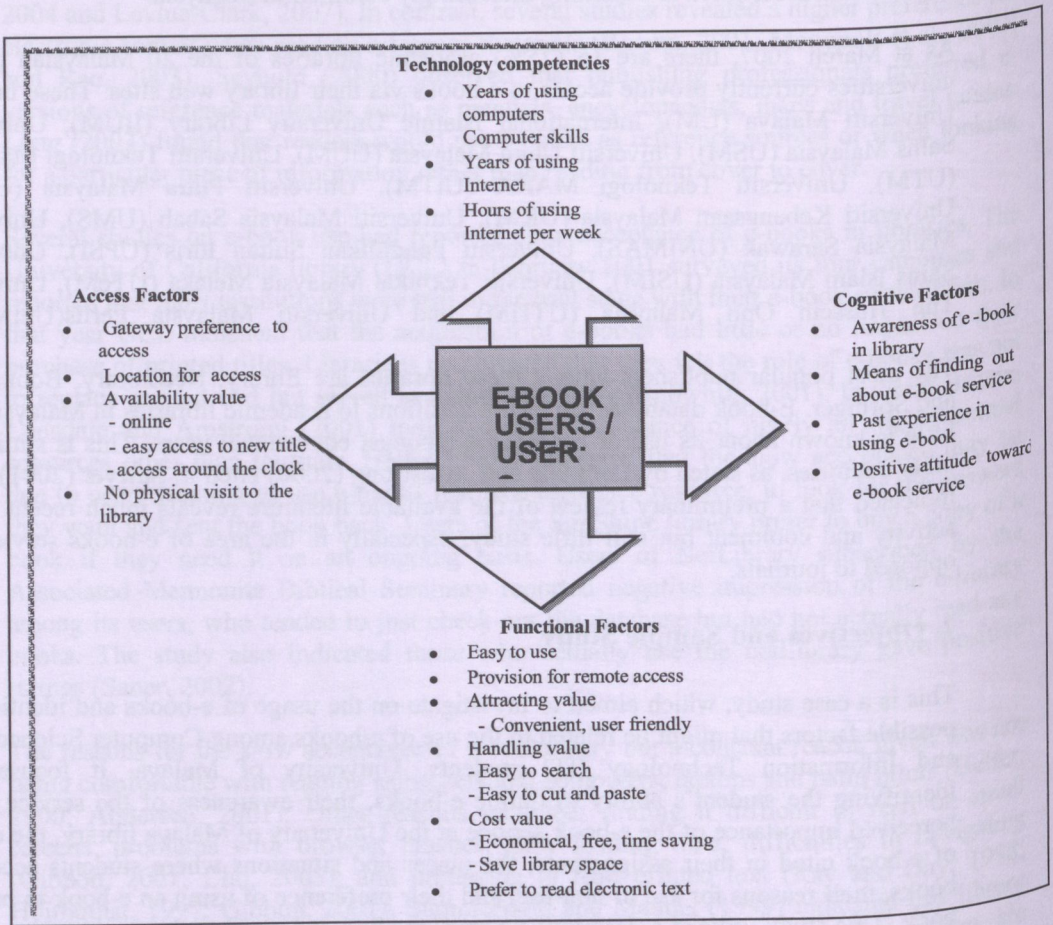


Figure 1: E-book Use Model

**(a) Technology Competencies**

Technology competencies such as knowledge and skills in using computers and Internet applications are essential in using any kind of electronic resources and services. This study assumes that ICT literate students would more likely use e-books. This is because the user of e-books need to possess certain skills for locating and retrieving information within a book or across a collection of books and handling reading devices like Rocket e-book, Softbook, PDAs and Palm pilots. Although the majority of respondents had at least 1 to more than 7 years of computer experience prior to entering the degree programme (72%), surprisingly more than 60% indicated that they had not used the e-books before the survey (Table 1). This corresponds to Chu's (2003) findings, which reported that only a minority of his respondents has used e-books. This study found that there was no significant difference in e-book use and gender even though more male students (42 out of 81, 44.7%) used e-books than female students (339, 4.8%). The chi-square test also revealed no significant difference between the number of hours spent on accessing the Internet per week and use of e-books (Table 2). Both genders were heavy users of the Internet (58, 72%) and spent between 5 hours to more than 7 hours accessing the Internet.

This situation may indicate that although respondents are heavy user of the Internet and rate themselves as skilled in computer use, they hardly visit the library website or use the e-book service provided. This may be the reason for their ignorance of the service. Perhaps the surest way of making them use the e-book is to encourage academic staff to include e-book titles in their reading list as this method have been indicated to help increase use (Summerfield and Mandel, 1999). Also, academic libraries need to be creative in finding other means besides their websites and brochures to sell the service to users.

Table 1: Total Level of E-books Usage (n=206)

Used e-book in the past		Gender		Total
		Male	Female	
No	Count	52	73	125
	% within Column	55.3%	65.2%	60.7%
Yes	Count	42	39	81
	% within Column	44.7%	34.8%	39.3%
Total	Count	94	112	206
	% within Column	100.0%	100.0%	100.0%

Table 2: E-book Use by Hours Spent on Online Accessing the 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
	% within Row	0.8%	6.4%	12.8%	29.6%	50.4%	100.0%
Yes	Count	2	11	9	21	37	80
	% within Row	2.5%	13.8%	11.3%	26.3%	46.3%	100.0%
Total	Count	3	19	25	58	100	205
	% within Row	1.5%	9.3%	12.2%	28.3%	48.8%	100.0%

$$\chi^2 = 4.268, df4, p = 0.371$$

### (b) Cognitive Factors

Students' cognitive makeup refers to their knowledge, perception, impression and attitude towards e-books. The students in this study seemed to understand the concept of an e-book as most of them gave acceptable definitions (Table 3).

Table 3: Perception of E-books (n=206).

Definitions	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

The majority of the students (103 out of 206, 50%) discovered information about the service from the UML website and the rest got to know via their lecturers (36), friends (27), librarians (26) and library brochures (6). The students also rated positive towards this service, indicating they understood the potential of such resources even though they had not used it (Table 4). The results indicated knowing about e-book and having a positive attitude towards e-book was not a definite determinant of use. However, it was found that past experience of e-book use was significantly related to e-book use, especially

among male students, as more male students who were past users of e-book were also current users ( $\chi^2=8.251$ ,  $df2$ ,  $p<0.05$ ). This indicate that when students know about the service they would attempt to use and familiarity in using the service would most likely lead to current and future use. Wei’s study (2003) had 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. The libraries therefore, need to initiate student to use the service as the first step towards probable future use as past experience (especially if it is a positive one) would likely lead to subsequent use.

Table 4: Students’ Reaction Towards E-books Service (n=206)

Reaction towards e-books service	Count	%
Negative	2	1.0
Neither negative nor positive	41	19.9
Positive	145	70.0
Very positive	17	8.3
No answer given	1	0.5
Total	206	100.0

**(c) Access Factors**

Access factors refer to situations that reveal how, and where users access e-books. “How” refers to the gateways used to access the e-books and “where” refers to the location where the service could be used. The results revealed that library website was the most favourable gateway used to access e-books (65.4%) and the location of access was usually the faculty laboratories (55.6%), the students’ own homes (24.7%) and library (16.0%). This revealed that most of the e-book users were remote library users and they were reluctant to visit the library. Hence, making remote students aware of the “availability” of the service and online user training is the first step towards attracting either on-site or off-site non-users when they attempt access to the service through the library website. In an open ended section of the questionnaire, a total of 54 statements were collected about student’s perceived advantages of using e-books from the UML e-book databases and the responses are categorised and summarized in Table 5. Accessibility is rated as the most important criterion given to e-book use.

Table 5: Values Given to E-Books Services at the UML

No.	Advantages	Total (n=54)
1.	<u>Availability value</u>	
	Available online	12 22.2%
	Easy access	10 18.5%
	Accessible 24x7	7 12.9%
2.	<u>Enticing value</u>	
	Convenient	4 7.4%
	User friendly	3 5.6%
	Alternative service for library users	2 1.9%
3.	<u>Handling value</u>	
	Easy to search	3 5.6%
	Searchable	3 5.6%
	Easy to cut and paste	1 1.9%
4.	<u>Cost value</u>	
	Economical, free	4 7.4%
	Time saving	4 7.4%
	Save library space	1 1.9%

Easy access and immediacy were also stressed by McCarty (2001) and Snowhill (2001) to support distance or remote user needs. Ambikapathi (1999) described that accessibility was 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). However, this should not be a hindrance for e-books use as the campus networked environment allows for the use of resources remotely 24 hours a day and seven days a week.

Online help guides and “Frequently asked questions (FAQ)” about e-books and other online services would help provide easy access for all level of users. Special links via the library web sites about library training sessions or workshops would increase awareness about the service and its access. Simultaneously, libraries may also announce information about new library services and resources through the library or university newsletters.

#### (d) Functional Factors

Functional factors refer to situations that make it easy and cost effective for users to use e-books. It answers the question of why or purpose of using e-books. The 81 users of e-books in this study indicated ‘convenience’, ‘easy to access’ and ‘user friendly’ as the criterion for using the e-books. Similarly, Chu (2003) also reported that “available around the clock” and “searchable” were reasons given by users in the United State. Non-users of the current studies indicated preferring printed text and reported having little knowledge about e-books (Table 6). The results indicated that the main reason for non-use was the preference for the printed text, especially if the text was continuously used throughout the academic year. This result is in accordance with the results of a recent e-book user study among Humanities at the University of Denver. Levine-Clark (2007) reported that 67.7% of Humanities students prefer the print copy of a book to the electronic version.

Table 6: Reasons for Using or Not Using E-books

<b>(a) Reasons for using (n=81)</b>	<b>Count</b>	<b>%</b>
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
<b>(b) Reasons for not using (n=125)</b>	<b>Count</b>	<b>%</b>
Prefer paper books	57	45.6
Little knowledge on how to use or access e-books	44	35.2
Inconvenient	35	28.0
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 were permitted to give more than one reason.*

The e-book users mainly used e-books for writing assignments or research projects (54.3%), reference (30.9%), leisure reading (6.2%) and browsing (3.7%). This is in agreement with the findings by McCarty (2001) and Guthrie (2002). This pattern of e-book use applies to both male and female students. Those who referred to the e-books however, rarely cite these resources in their assignments. Of the 81 e-book users only 8.9% (7) indicated citing more than 50% of the e-book that they have read. Both male and female respondents (82.7%) preferred to read the full chapter(s) or page(s) of e-books on the computer screens than the print format.

Past use of e-books was found to be a significant factor in determining use of e-textbooks and preference for using e-book for reference purposes ( $\chi^2 = 5.169$ ,  $df1$ ,  $p < 0.05$ ) (Table 7). This study also found a very significant difference between past usage of e-books and preference for e-reference book ( $p = 0.01$ ) (Table 8).

In this instance similar to the UCL (2001) study, the library can help by providing both print and electronic versions in the early stages of the services until users become more familiar in using the service. Both print and electronic text should be catalogued as separate entities and included in the library's catalogue. The user can choose to refer to whichever version that is available. This is in accordance with the experiences of the University of Rochester libraries, where they reported that inclusion of the e-book titles within a library's catalogue had increased use of the collection (Gibbon, 2001).

Table 7: Preferred Format for 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
	% within Column	86.4%	73.8%	81.5%
Electronic format	Count	17	21	38
	% within Column	13.6%	26.3%	18.5%
Total	Count	125	80	205
	% within Column	100.0%	100.0%	100.0%

$\chi^2 = 5.169$ ,  $df1$ ,  $p < 0.05$

Table 8: Using E-reference Books 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
	% within Column	53.6%	25.0%	42.4%
Electronic format	Count	58	60	118
	% within Column	46.4%	75.0%	57.6%
Total	Count	125	80	205
	% within Column	100.0%	100.0%	100.0%

$\chi^2 = 16.334$ ,  $df1$ ,  $p < 0.01$

#### 4. Conclusion

This study provides a general picture on the use of e-books amongst CS and IT undergraduates. It was evident that the level of e-book uses among the students was still low. The reasons for this were closely related to preference of paper format and lack of knowledge on its use. The way in which a user uses e-books is influenced by many factors.



The results revealed a numbers of positive strategies that libraries could consider to increase use of e-books and this includes; developing relevant e-book collections based on the users' needs, selecting titles based on students required textbooks or reading lists and promoting activities to market e-book use among students. Further, due consideration is needed to boost the electronic reference collection since the majority of the users prefer online reference materials.

Librarians could work closely with academic staff by informing them of relevant e-book text that could be included in their course prescribed reading list. The study by Appleton (2005) at the Edge Hill higher education institute in Liverpool in the north west of England has indicated that embedding e-book references in course requirements mounted on their WebCT courses did increase usage. In this case the promotion and embedding of e-books were customized and targeted at a particular user group that is health studies and sports science. Hence, segmenting target groups in the marketing strategy is essential.

A number of university libraries currently have to cope with remote users as distance learning as e-learning is becoming common. The needs of those remote off-campus library users need to be catered for and this may include promotion and training via the right channels to ensure that everybody is made aware of the service. One of the best practice cited was at the Staffordshire University Library, where training were given by subject areas for each undergraduate and postgraduate year as well as training by subject for the academics (Bennett and Monica, 2005). In this context, librarians become instructors for users and tutor users on the options available when they are using e-books service. This inevitably requires them being familiar with the e-book service and keeping abreast of rapidly changing e-book technology.

The e-book use model highlights possible factors that may be related to e-books' usage patterns among academic library student users and address many of the library user-services related problems. The knowledge on users' information needs and their information seeking behaviour becomes important in times of financial constraints and when evidence is needed to justify spending on any resources. The user studies on the use of electronic services and resources therefore remain essential. To fully understand the situation the study may be replicated to investigate the usage pattern of e-books among students from different faculties such as Medical, Legal and Social Sciences. It would be interesting to compare the similarities and differences in usage pattern between the different groups of students. This study did not focus on investigating the features of e-books by specific e-book databases. Further study can be carried out to obtain more detailed information on the features of e-books that user value most by different databases. This will help to provide more insights on the overall preference patterns of use as a whole.

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