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**Print Vs. Electronic:
User Preferences for Information Resources:
A Comparative Study**

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Print Vs. Electronic: User Preferences for Information Resources: A Comparative Study

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Abstract

Though University libraries have positioned themselves as the main vehicles for the organization, access, distribution and use of knowledge, current library services will eventually be inadequate to keep pace with the demands and expectations of modern library users. Therefore, this study is focused on the assessment of users preferences for electronic and print information resources available in Sri Lankan University Libraries.

University of Peradeniya (UP) and University of Moratuwa (UM) were selected for the study. Survey method was adopted and undergraduate students of both Universities were considered as target Population. Proportionate stratified random sampling method was performed to select the samples. Based on faculties of two Universities, five percent (5%) from the population of each year such as second, third, fourth and final year were selected randomly. Questionnaires were used as the main research tool for the survey.

According to the results, it was revealed that user preferences, expectations for print and electronic collection information resource collections vary significantly between universities. To add up majority of respondents had favourable attitudes towards print resources than electronic information resources than expected. Though, majority of users prefer to have digital libraries in future, they expect print collection to be continued, sufficient funds allocated to maintain the print. Users are very much satisfied with the print book collection in both university libraries but print journals and electronic journals are underutilized. Hence user education becomes vital in context of traditional or digital libraries.

Key Words Academic libraries, User Preference, Undergraduate students, Information resources, Electronic information resources, Print information resources

Introduction

University libraries have positioned themselves as the main vehicles for the organization, access, distribution and use of stored knowledge of quality. The role of these institutions and associated information services is to contribute to the teaching, learning and research needs of their members.

The present supply of information resources is made up of a range of products that may exist in different forms, such as paper, microform, CD-ROM, or online accessible databases (either traditional online, or Internet). Electronic Information Resources (EIRs) are now recognized as being of greatest importance to even small academic libraries and they consume ever-increasing budgets often to the detriment of monographic acquisitions. The arrival and proliferation of electronic information and digital libraries have influence and changed the way of using print sources by the users and it has also sparked new wave on the preferences and perceptions of print and electronic resources.

However the advent of EIRs and their increased proliferation in libraries have changed the collection development functions and the roles of the librarians. Justifying decisions of the library in purchasing has also become increasingly important. When library budgets are limited, librarians are keenly aware of the challenges of providing library materials for their users. When books are purchased, they often available in the stacks for use. Electronic resources, in contrast, lack the physical presence of books and journals (White and Crawford, 1997). Librarians today are facing the problem of deciding which resources to acquire and in what format. An additional wrinkle is how to balance new electronic acquisitions with traditional print formats or even slightly older electronic resources such as CD-ROMs (with which users are more familiar).

Therefore librarians need to know the format preferences of the users for information resources to make the decision about what format to purchase. Although, there have been number of studies conducted on usage of print and/or electronic resources, very few studies have focused to address what format of the information resources users prefer. Since today libraries are at a crossroads in regard to purchasing and subscribing to print, electronic or both types of resources, it is hope that this study will assist librarians specially that are working in the academic libraries, in collections development. The detailed results of this survey may assist librarians in making decisions about maintaining collections with limited resources to satisfy the information needs of their users.

Therefore, this study is focused on the assessment of users' preferences for electronic and print information resources available in University of Peradeniya and University of Moratuwa with the following specific objectives:

- To find out users preferences for print and electronic information resources collections;
- To identify factors affecting to the users preferences for types of information resources;
- To find out users' expectations and concerns with regards to electronic and print information resources in future

Methodology

Survey method was adopted and undergraduate students of both Universities were considered as target Population. Proportionate stratified random sampling method was performed to select the samples. Based on faculties of two Universities, five percent (5%) from the population of each year such as second, third, fourth and final year were selected randomly. Questionnaires were used as the main research tool for the survey

Entire target population of University of Peradeniya belongs to 07 different faculties such as Arts, Agriculture, Medical, Science, Engineering, Dental Sciences, and Veterinary Medicine & Animal Sciences. Under the Main library there are 05 branch libraries for each faculty except for Dental Faculty. The Main library caters to the Arts faculty as well as to the whole University. Branch libraries cater to the respective faculties. However, students and the staff of the Dental Science Faculty share the resources which were available in Medical library to fulfill their information needs.

Target population of the University of Moratuwa belongs to three different faculties namely Architecture, Engineering and Information Technology. As University of Peradeniya, there are no separate branch libraries for each faculty.

Literature Review

Over the past years, user's perceptions and preferences for print and electronic resources have been the focuses in numerous studies. Liu (2006) in his study explored the extent to

which graduate students in a Metropolitan University use print and electronic resources and results explained that the students desire to meet their information needs through a mix of print and electronic resources.

Dilevko and Gottlieb (2002) conducted a web-based survey of undergraduate library users at the University of Toronto and they found that while undergraduates typically begin researching assignments and essays using on-line resources, traditional print resources (books and print journals) remain crucial components in their research because of their reliability, completeness, accuracy, and permanent accessibility.

A survey commissioned by OCLC (2002) of 1050 US college students (undergraduate and postgraduate) who used the Internet for their academic assignments also indicates a strong reliance on search engines, but also a strong reliance on books.

Urquhart and others (2003) conducted a study which was aimed at to examine the uptake and use of electronic information services in higher education in the UK with one of the objectives of examine which services were used by students and academic staff. The results explained that students were using EIRs primarily for coursework, which could be background research, preparing presentations, or making lecture notes. It was also confirmed by the survey, which was conducted by the Armstrong, *et al.* (2001). This study further showed that many students still turn to books as well as the Internet for routine academic queries, with books used first more frequently than the Internet.

The Liew *et al.* (2000) conducted another major user study to investigate the graduate students' perceptions of e-journals. The results of the study revealed that a vast majority of graduate students preferred e-journals over print journals and they were cited the reasons were links to additional resources, searching capability, currency, availability, and access ease.

The study, which was carried, by the Majid and Tan (2002) investigated that printed materials were the most preferred information format among the students and unexpectedly, the use of databases and electronic journals was quite low among the computer engineering students.

Melgoza *et al.* (2002) conducted a research on order to determined user priorities and preferences for information resources and their selection criteria. The survey results showed that for the use of printed materials is still popular among faculty and graduate students while undergraduates primarily prefer to use Internet services.

Christianson and Aucoin (2005) investigated the differences in format preferences of books either electronic or print books, of the students. It was found that differences in format preference of users were in subject and classification. Patrons appeared to prefer certain subjects, mostly notably philosophy, in print and some, such as library science in e- format.

Kebede (2002) argued that the current change from print and other forms to electronic forms in which information is made available is bringing about changes in the information needs of users.

Electronic resources are vital, but extremely expensive and are concerned about their effective use. Awareness of new electronic resources is a key issue regarding use and acceptance. It is widely held view that low awareness and poor skills are among the primary reasons for the under utilization (Robert 1995; Rehman and Ramzy, 2004; Miller-Francisco, 2003). Miller-Francisco (2003) suggested with the more training or promotion can sometimes remedy low usage. Condic (2004) also found his survey that library instruction is a valuable form of promotion and also confirmed that library instructions may also be a factor in students' preference for purchase of library resources.

The survey conducted by Dadzie (2005) found that higher percentage of users was indicated that library should maintain the quality and quantity of its print collection.

Librarians are paying more attention to identifying, selecting, and developing information resources that match the needs identified by the students. From many studies (Liew *et al.*, 2000; Franklin and Plum, 2002; Rudner *et al.*, 2002) explored the why students and other clientele like in a EIRs as listed below.

- Speed and ease of use
- Cross-references and the flexibility of having various ways to get at the same topic
- Ability to quickly build a bibliography
- Rapid access with no lines to wait in to use a resource
- Frequent updates
- Provision of a lot of information
- An online catalog that is easy to understand and use, that provides quick results
- Quick to use when you know what you are looking for
- Quick and convenient, you don't have to walk around and collect a lot of heavy books
- Keyword search capability
- Date limitation commands
- E-mail capability
- An online catalog and electronic resources that make navigating a large library easier

Therefore these studies indicate that library resources play an integral role in the scholarly communication continuum, and a role that promises to be increasingly important as the transition to electronic media continues. Also these surveys helpful to find out, user categories and their preferences towards library resources, in order to market and target services more effectively. On the other hand, overwhelming availability and supply of information forces press on users to sort and filter through the wealth of information and sometimes make users confused regarding their validity and reliability.

User Preferences for Information Resources

Of the 291 questionnaires sent, 250 were returned at a rate of 85.8% from the students of University of Peradeniya (UP). Out of 138 questionnaire sent, 121 were returned at a rate of 87.6% from University of Moratuwa (UM) students. Overall response rate was 86.3%.

Students of two Universities were asked which types of resources (printed, electronic or both types of resources) that they using. The overall respondents showed that 91% use both types of resources while 9% use printed resources only (Figure 1). However none of the respondents of both Universities use electronic resources only.

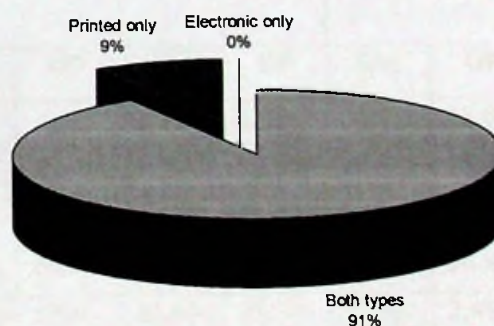


Figure 1. Use of Types of Resources

Results showed that there is evidence of association ($p=0.011, 0.006$) between Universities and type of information resources using. 97% students of UM and 89% students of UP were used both types of resources. Only 3% and 11% of students of UM and UP respectively used only printed resources. None of the students use electronic resources only (Figure 2).

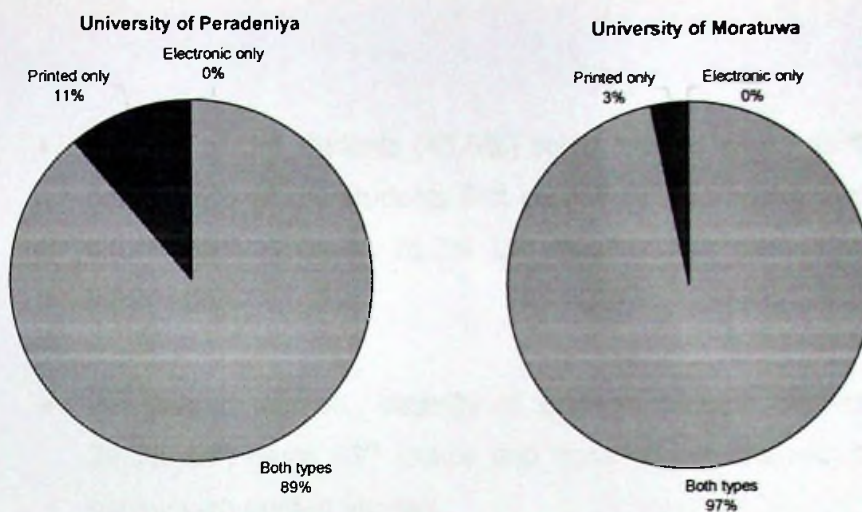


Figure 2. Use of Different Types of Resources by UP & UM Students

Students were asked to rank the type of information sources (printed books, printed journals, on-line resources, WWW, CD-ROMs or ask someone) they usually consult when they want to fulfill an information need. Their choices for information resources are presented in Table 1.

Table 1. Choices for information sources

Choice	Printed Books		Printed Journals		On-line resources		WWW		CD-ROMs		Ask someone	
	UM	UP	UM	UP	UM	UP	UM	UP	UM	UP	UM	UP
1	26.6%	71.7%	---	---	1.3%	1.4%	66.7%	26.8%	---	---	7%	6.6%
2	48.6%	18.4%	8.8%	25.3%	9.1%	10.3%	20.4%	36.2%	1.2%	10.5%	17%	12.7%
3	20.2%	6.9%	35%	29.5%	18.2%	21.4%	8.3%	18.3%	13.4%	17.8%	22%	31.5%
4	0.9%	2.5%	31.3%	26.1%	35.1%	18.6%	2.8%	16.4%	17.1%	25.7%	18%	16.2%
5	3.7%	0.4%	12.5%	13%	16.9%	25.5%	1.9%	2.4%	36.6%	22.4%	15%	16.8%
6	---	---	12.5%	6.1%	16.9%	21.4%	---	---	29.3%	20.4%	20%	14.2%
7	---	---	---	---	2.6%	1.4%	---	---	2.4%	3.3%	1%	2%

UM: University of Moratuwa

UP: University of Peradeniya

The results of the survey indicated that there were evidence of association between Universities and choice of information resources except for on-line resources available from the library web site and for ask someone. According to the Table 1, following conclusions can be made with respect to the types of resources.

- Majority of UM students (48.6%) select printed books as their 02nd choice and only 26.6% of UM students first consult printed books when they want to find information. However, 71.7% UP students first consult printed books to find information.
- For printed journals, majority of students of both Universities (35% UM and 29.5% UP) given 03rd choice and none of the students begin their literature survey with printed journals.
- It can be commented that majority of UM students (66.7%) turned first to the WWW as their preferred source of information. It seems that the convenient access and ease in searching are the chief factors contributing the selection of the WWW as first choice. However, library on-line resources, which are available from library website were not consulted at the same priority rate.
- Though majority of UM students consulted WWW first, majority of UP students (36.2%) consult WWW secondly when they want to find information. Use of library on-line resources was not given priority by UP students as well.
- Most of the UM students (36.6%) go to CD-ROMs to find information as 05th choice while 25.7% UP student select as 04th choice.

If same information available in both formats (electronic and printed) students were asked about their preference for use of books and journals. Except for electronic journals, there is evidence of association ($p=0.000, 0.000$) between Universities and choice of printed books, printed journals and electronic books for the same information.

According to the Figure 3, if the same information are available in both formats 67% UM students and 84% UP students prefer to use printed books while only 31% UM and 52% UP students prefer to use electronic books. 50% UM students and 19% UP students prefer printed journals while 37% UM and 33% UP students prefer to use electronic journals. Therefore it can be commented that if the same information are available in both formats undergraduate students of both universities still turn to use printed format to fulfill their information needs.

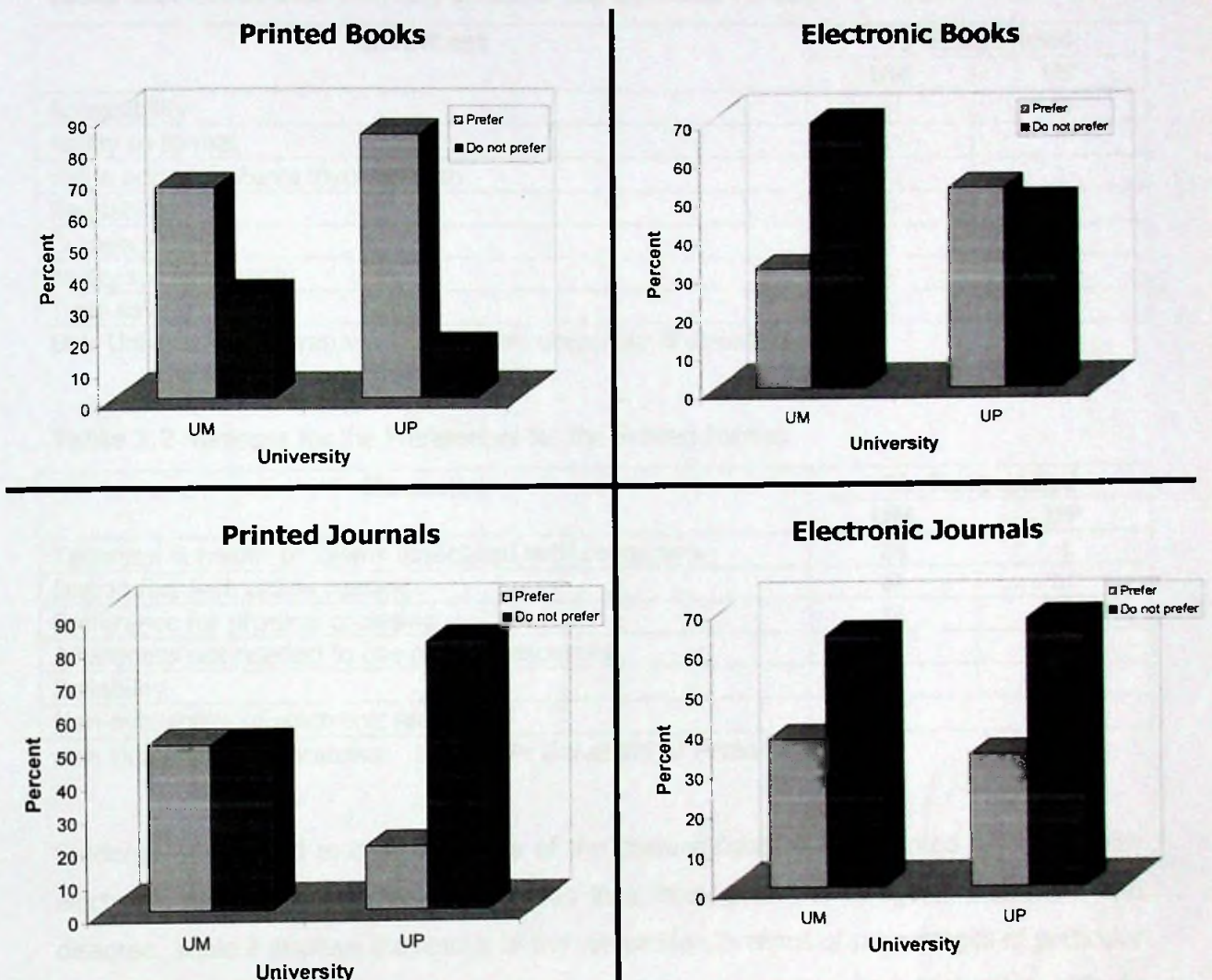


Figure 3. Choice of format for same information
 UM: University of Moratuwa UP: University of Peradeniya

There were many reasons given by the students for their selection of types of resources for same information. Out of total respondents, 215 respondents of University of Peradeniya and 105 students of University of Moratuwa were commented. All comments were grouped into statements and displayed in Table 2.1 & Table 2.2

Majority of UP & UM students who preferred electronic format stated accessibility was the main reason for their choice. On the other hand, majority of UP & UM students who preferred printed format stated discomfort with online reading and preference for physical browsing were the main reasons for their choice. Further, 28% of UM students stated that the technical & health problems associated with computers made them to choose printed format.

Table 2.1. Reasons for the Preferences for the Electronic Format

Comment	% Responded	
	UM	UP
Accessibility	21	14
Ability to format	11	0
Value added features involved with	12	1
Readability	6	4
Currency	1	1
Ability to store easily	2	2
Time saving	2	8

UM: University of Moratuwa**UP:** University of Peradeniya**Table 2.2** Reasons for the Preferences for the Printed Format

Comment	% Responded	
	UM	UP
Technical & health problems associated with computers	28	4
Discomfort with online reading	48	31
Preference for physical browsing	14	18
Awareness not needed to use printed resources	1	2
Reliability	2	1
Non-availability of electronic format	1	1

UM: University of Moratuwa**UP:** University of Peradeniya

Students were asked to compare some of the characteristics of use printed resources with electronic resources and give their opinion in a three point scale; agree, undecided and disagree. Table 3 displays the results of the comparison in terms of percentages of particular opinion. According to results, respondents of both universities had favourable attitude towards the characteristics of use of printed resources than the electronic resources. More than 50% of the respondents from both universities:

- do not trust information on Internet.
- satisfy information needs totally by printed resources.
- do not deal with new technology.
- had problems with the language – English being the medium of most electronic resources.

Further, 52% of UM respondents and 46% of UP respondents were in a view that electronic resources are difficult to use than printed resources. However, 76% of UM respondents and 52% of UP respondents stated that they use Internet most of the time since it provide the information they need. Respondents had diverse opinions about the availability, accessibility and service of the library.

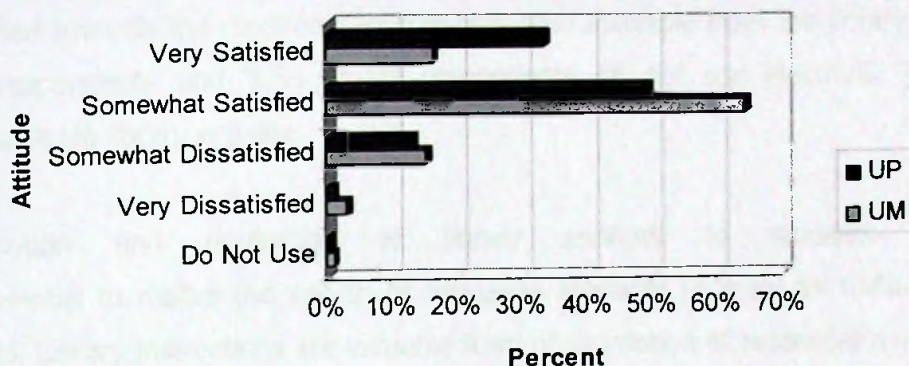
Table 3 Characteristics of Use Printed Resources in Comparison with Electronic Resources

Statement	UM			UP		
	Agree	Undecided	Disagree	Agree	Undecided	Disagree
I use printed resources since I don't trust the information on the net	71%	21%	5%	72%	18%	8%
I totally satisfy my information need by printed resources	78%	15%	7%	57%	26%	15%
I rely on printed resources since I don't want to deal with new technology	91%	7%	1%	82%	9%	6%
I am not using electronic resources since most of them are in English and I am not conversant in English	91%	8%	0%	78%	9%	11%
Electronic resources are more difficult to use than printed resources	52%	19%	27%	46%	20%	32%
Printed resources are reliable than electronic resources	26%	40%	30%	27%	39%	30%
I prefer electronic information since I do not have time to go to the library for using printed resources	25%	19%	55%	11%	25%	61%
I mostly use electronic resources since library does not offer what I need	31%	30%	37%	20%	31%	46%
I mostly use electronic resources since the services at the library is not satisfied	13%	26%	58%	9%	26%	62%
I have to use electronic resources because library is closed when want it to be	35%	26%	38%	21%	22%	54%
Because library is too far away, I mostly use electronic resources	16%	21%	58%	08%	16%	72%
Most of the time I use Internet because it provides the information I required	76%	10%	12%	52%	26%	18%

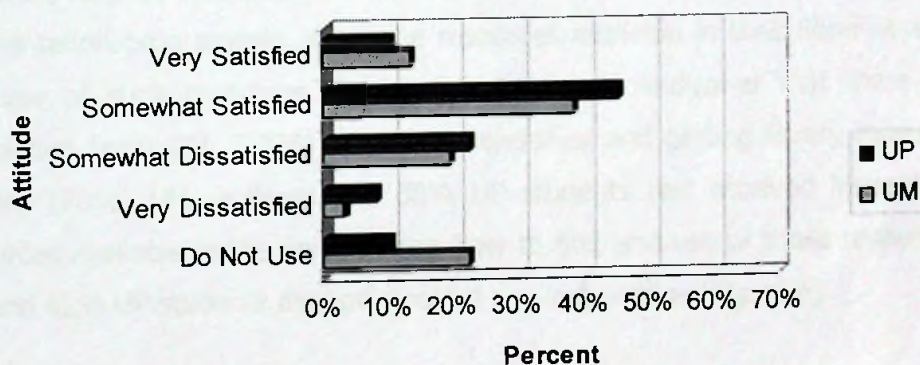
UM: University of Moratuwa**UP:** University of Peradeniya

However, respondents' opinions of current library holdings - both print (books & journals) and electronic - can be summarized as follows:

Printed Book collection



Printed Journals Collection



Electronic Journals Collection

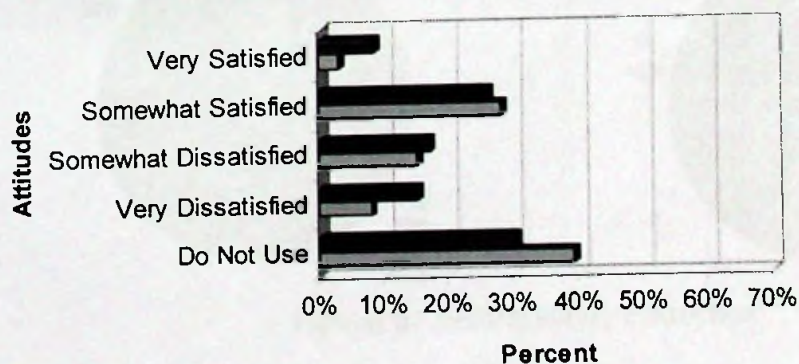


Figure 4. Attitude towards existing library collections
 UM: University of Moratuwa UP: University of Peradeniya

There is evidence of association between two universities in showing their attitudes towards existing library collections. Majority of students (80% of UM and 82% of UP) were satisfied towards the print book collection of the respective libraries. On the other hand, only 51% of

UM respondents and 55% of UP respondents were satisfied with print journals collection. It was reported that 22% of UM respondents and 10% of UP respondents do not use print journal collection. In addition, 31% UM respondents and 34.4 % UP respondents were satisfied towards the electronic journal collection available from the library website. 39% of UM respondents and 30% of UP respondents do not use electronic journal collection available via library website.

Promotion and marketing of library services to students of Universities is essential to realize the wealth of resources available to them for fulfill their information needs. Library instructions are valuable form of promotion of resources available and it may be a factor for the preference for purchase with limited library budgets.

Therefore further, students were asked whether they had completed the library instructions or orientation programmes about the resources available in their libraries and how to find and use of such resources. Results of the survey indicated that there is evidence of association ($p=0.027, 0.025$) between Universities and getting library instructions. Seventy percent (70%) UM students and 58% UP students had received instructions about the resources available in the libraries and how to find and use of those resources, while 30% UM and 42% UP students did not received any instructions (Figure 6).

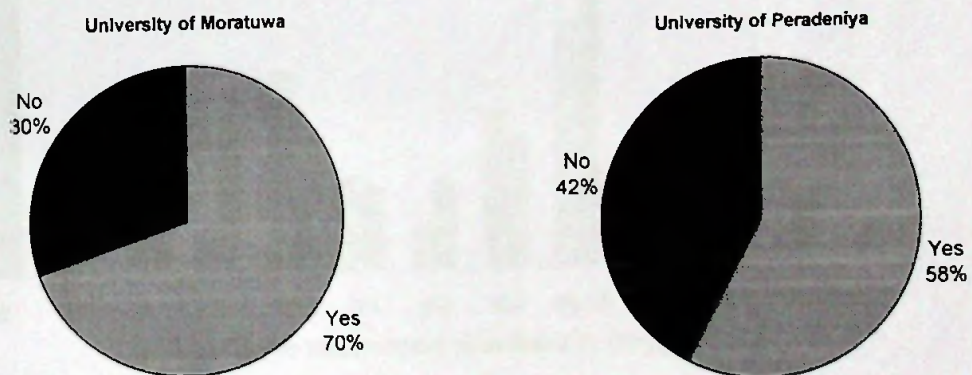


Figure 5. Getting library instruction

Further, Students were asked to indicate their priority in terms of information provision in the libraries which they used. Priorities were given by the researchers as follows.

- a Maintain print collection
- b Provide access to e-resources
- c Supply more PCs
- d Provide training to use e-resources

Results showed that there was no evidence of association ($p=0.193, 0.153$) between Universities and priority for information provision in libraries. According to the Figure 6, it can be commented that majority of UM students (33.3%) and 26.5% UP students were selected maintain print collection as only choice for information provision in libraries. 5.3% UM students and 6.4% UP students indicated providing access to EIRs. Approximately 7% UM students and 6.4% UP students indicated providing access to EIRs. Approximately 7% UM students of both Universities indicated adding more computers to the library. Only 2.6% UM and 8.1% UP students expected provide training to use EIRs. Many participants of both Universities were selected combinations of priorities for information provision in libraries. 14% UM and 15.4% UP students select all the options (a,b,c & d) as their priorities. Therefore it can be commented that while maintaining the print collections, students of both Universities expect providing access to electronic resources with supplying more PCs to access electronic resources. Also they are expecting the providing of training to use electronic resources.

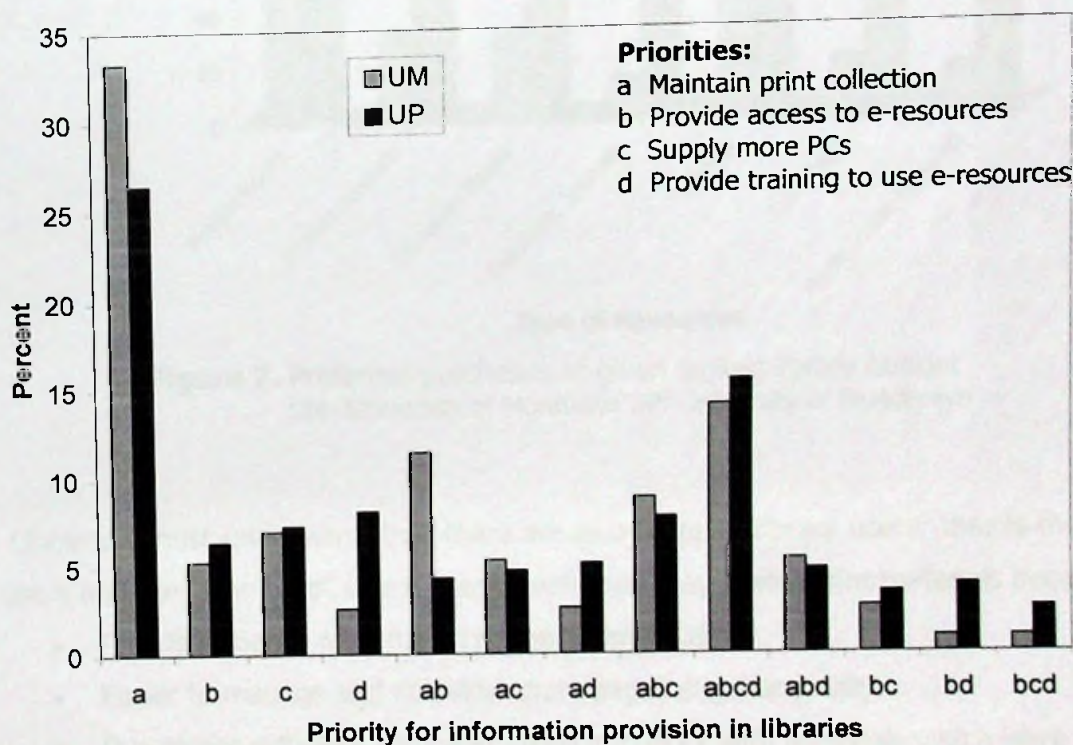


Figure 6. Priority for information provision in libraries
UM: University of Moratuwa UP: University of Peradeniya

If the libraries have only limited amount of money to spend on resources, students were asked their preference of purchasing for different types of resources. Given limited library budgets, majority of students of both Universities (35.9% UM and 31.1% UP students) would mostly prefer to have the money spent on printed books while 10.4% UM and 6.6% UP students preferred spend on electronic books (figure 7). 26.6% UM and 22% UP students preferred spend money to access internet. 4.3% UM students and 6.5% UP

students selecting as their primary preference as to spend money on electronic journals while 10.8% UM and 12.3% UP students preferred to spend money to purchase printed journals.

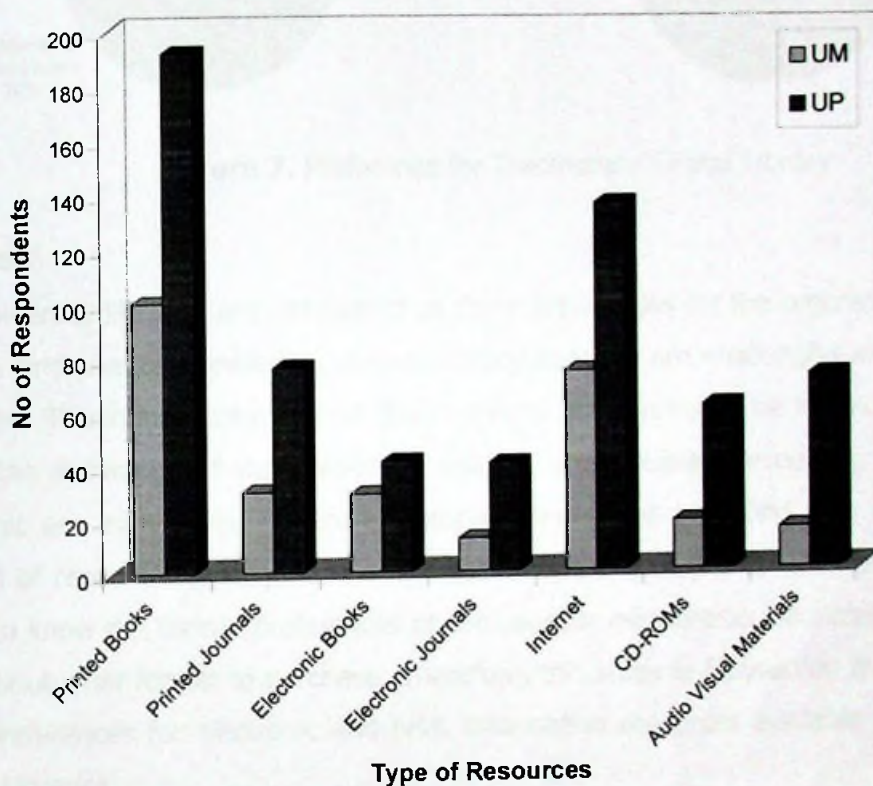


Figure 7. Preferred purchases of given limited library budget
 UM: University of Moratuwa UP: University of Peradeniya

Librarians must understand that there are two types of library users: that is the traditional users and the “new bred” users. Traditional users may prefer print materials because;

- Print is easier to read for extended period of time
- Easier to manage and can view more pages simultaneously
- Due to not sufficient computer literacy to work with materials which were electronic

When analyzed their preference for the type of library (digital or traditional library), results showed that there is evidence of association ($p=0.002, 0.002$) between Universities and choice for traditional and digital library. 70% UM students and 53% UP students prefer digital library while others (30% UM students, 47% UP students) prefer traditional library (Figure 7).

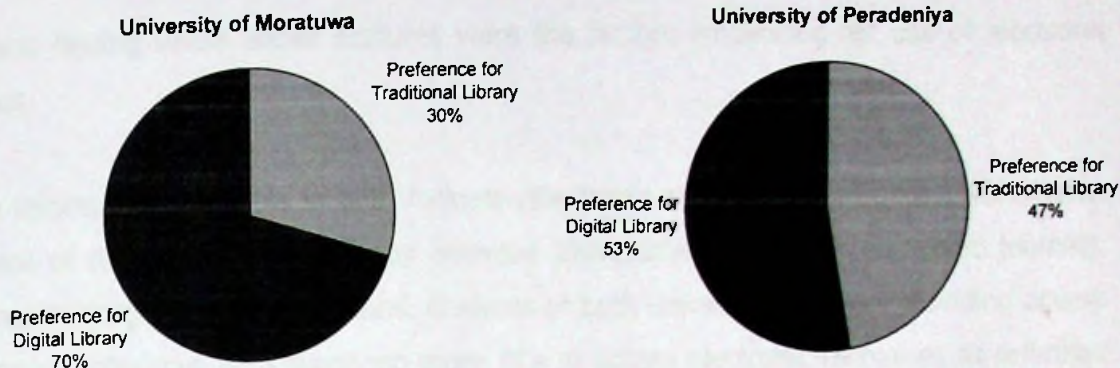


Figure 7. Preference for Traditional / Digital Library

Conclusion

Though University libraries are considered as the main vehicles for the organization, access, distribution and use of knowledge, current library services are challenged in the Internet environment. Traditional Libraries and their services will eventually be inadequate to keep pace with the demands and expectations of modern users. Library resources, whether print or electronic are expensive. Therefore, librarians today are grappling with the issues of which type of resources to acquire and in what format and thus it is essential need of the librarians to know the format preferences of the user for information resources to make the decision about what format to purchase. Therefore, this study is focused on the assessment of users preferences for electronic and print information resources available in Sri Lankan University Libraries

University of Peradeniya is considered as the oldest, largest and traditional university in Sri Lankan University System. On the contrary, University of Moratuwa is comparatively new and technical university in the country. Therefore it is somewhat interesting to note user preferences for information resources. It was found that reading preferences and use of print and electronic vary significantly between University of Peradeniya and University of Moratuwa. The study revealed that majority had used both types of resources. However some students of both Universities use only printed resources and none of the respondents of both Universities use electronic resources only.

When the students want to find information students of UM were consult first WWW while students of UP were turned first to printed books. But none of the students begin with printed journals. If the same information is available in both formats undergraduate students of both universities still turn to use printed format to fulfill their information needs. Easy of use, readability, lack of computer awareness among users and reliability were major factors of influence to use printed resources, while easy 24 hours accessibility, ease of use,

speed and having value added features were the factors influencing for use of electronic resources.

If same information available in both formats (electronic and printed) students' preferences for choice of format vary significantly between Universities except for electronic journals. While maintaining the print collections, students of both Universities expect providing access to electronic resources with supplying more PCs to access electronic resources as priorities in terms of information provision in the libraries. Also they are expecting the providing of training to use electronic resources. If the libraries have only limited amount of money to spend on resources, majority of students of both Universities would mostly prefer to have the money spent on printed books.

Library instructions are valuable form of promotion of resources available and it may be a factor for the preference for purchase with limited library budgets. Students getting library instructions also vary significantly between two Universities. The study explored that preference for the traditional and digital library significantly varies between two Universities.

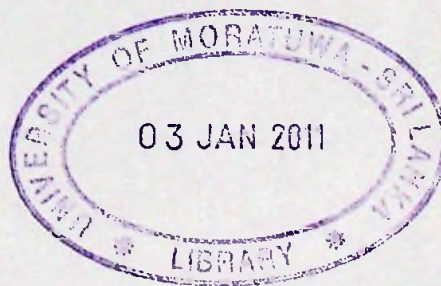
While libraries may want to remain exclusively with print or move entirely to electronic, users might want something completely different. Majority of participants in this survey desire to meet their information needs through mix of print and electronic resources. As budget become tight, users still choose print from electronic and print. This study was confined only to two Universities, as time factor is the major limitation. Only undergraduates were considered and all first year students were excluded from the sampling frame, because they are new comers to the University and awareness about the library facilities and services were low among them. Hence, in order to make the decision about what format to purchase, librarians need to do further user surveys, user studies and educated guesses in given universities, levels, disciplines etc. On the other hand, librarians must continuously and actively market of resources available to their users.

Since today libraries are at a crossroads in regard to purchasing and subscribing to print, electronic or both types of resources, it is hope that this study will assist librarians specially that are working in the Sri Lankan academic libraries, in collections development. It is possible to identify trends and issues influencing the user preference for information resources and the detailed results of this survey may assist librarians in making decisions about maintaining collections with limited resources to satisfy the needs of their users.

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