

## **Comparison of the subscription cost of print & online periodicals and their usage at the University of Moratuwa Library**

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### **Abstract**

The objective of the study was to explore the use of different periodical materials recommended by academic members of the University of Moratuwa against the subscription cost per use for each periodical title. The subscription costs & usage statistics related to the periodical titles subscribed in 2010 were analyzed with respect to the period, February to July 2010. The case study method was adopted in this study. The analysis confirmed that online databases have the lowest subscription cost per use and online + print journals have the highest subscription cost per use. The zero usage of periodicals, especially online materials, raises many questions regarding the periodical recommendations of academic members for their subject fields. The library should maintain a close and collaborative relationship with the departments and new introductory programmes should be designed to increase the awareness of the periodicals of the library users. Providing the facility for the remote access of online materials was another important factor to increase the usage level.

*Key Words:* Electronic journals, Print media, User studies, Collection Management, Subscriptions

### **Introduction**

Scholarly journals could be considered as one of main important source of information where the progress of science and technology is recorded. In the scholarly world, the scholars become producers, as well as the consumers of information. Journals and journal articles were published due to the rapid development in science and technology. In 1665, the first printed scientific scholarly journals were published simultaneously in London (Philosophical Transactions by Royal Society) and Paris (Journal Des Scavans) (Harter & Kim, 1996)

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For many decades, the ownership and storage of materials was considered to be the main role of libraries. But with the penetration of technology to libraries, the concept has changed through the improved accessibility and availability of materials. There have been revolutionary changes in the traditional library environment and in the expectations from libraries. Both print books and print periodicals have now moved towards electronic versions. The first electronic journal appeared in the 1970s (Harter & Kim, 1996). It was not available to large number of users because of the high cost. This was one reason why electronic journals were not widespread at that time.

In modern society computers and related technologies have a major impact on information dissemination. Today electronic databases, e-books, e-journals and their indexes are the most important information resources for organizing knowledge. Access to online journals, bibliographic databases, online catalogues and Internet have altered the traditional library use patterns over the last few decades. Many academic institutions are currently building collections of online materials to increase access to online resources.

Usage studies are very important to monitor the usage of costly resources in academic libraries such as online journals. Many academic libraries offer access to both print and electronic periodicals for their patrons. In this environment, the collective evaluation of journal usage of both periodical formats is essential for the development decisions of the library.

This study was conducted at the Library of the University of Moratuwa, which is a pioneer engineering library serving a broad range of courses in Engineering, Information Technology and Architecture. The University of Moratuwa consists of approximately 3950 undergraduate students, 815 postgraduate students and 290 academic staff members. The 950 students of the Institute of Technology University of Moratuwa (ITUM) belong to the student community of the University. The Library is always committed towards providing access to both print and electronic resources for its patrons in supporting

research and curricula. Computers and computer applications have been widely introduced within the library in addition to the integrated library management system (Libsys) introduced in 2000.

### ***Literature Review***

As periodicals are the most costly resource in libraries, many studies have been conducted to identify their actual usage. Morse & Clintworth (2000) conducted a study at Norris Medical Library, University of Southern California, to compare the usage of print and online periodicals available for patrons. The study results showed that journal volumes subjected to the study have been accessed electronically more than ten times when compared to the print versions during the six-month study period. The research method applied by Morse & Clintworth (2000) was followed by the study conducted at the Library of the University of Moratuwa with some modifications. Clintworth and Morse (2000) obtained data on electronic usage from Ovid transaction logs. The usage of the print volumes was tracked by the scanning of barcodes on journal volumes during the re-shelving process.

The impact of online journals on print journals was examined by Groote & Dorch (2001) conducting a research at the Library of Health Sciences–Peoria, a regional site of the University of Illinois at the Chicago (UIC) library. Their findings have indicated a decrease in the use of print journals suggesting online journals as the most preferred source in finding research literature. The same kind of study was conducted by Punchihewa (2008) to identify user attitudes towards online resources at the Library of the University of Moratuwa. He found that users prefer to use both online and print versions of the journals for research purposes. In his study, Punchihewa further analysed the reasons for using online resources and also the barriers for not using the online resources by different user groups. Rusch-Feja & Siebeky (1999) conducted a survey to investigate researchers' use and acceptance of electronic journals. The results of this survey showed a significantly high acceptance of electronic journals than print journals. The researchers also rated the advantages and disadvantages of electronic journals related to various aspects such as

currency, ease of access, timeliness, up-to-date information and additional searching facilities, etc.

Montgomery (2000) suggested and developed a framework to measure the cost of periodicals for the library. He introduced new factors other than the subscription cost. He defined these as non-subscription costs. A main objective of his research was identifying how non-subscription costs change in libraries. Space costs, systems costs, supplies & services costs and staff costs were counted as non-subscription cost. Montgomery & King (2002) conducted a research at Hagerty library in Drexel University to compare library and user related costs of print and electronic journal collections by considering the new factors defined by Montgomery. After considering all the factors, the results suggested electronic journals as the most cost effective source. Also Montgomery and King have observed that print and electronic journal usage data cannot be compared directly for several reasons. They have stressed the occurrence of major differences even if the same title is compared. Re-shelving the count of print journals assumes that only one article was referenced before it was re-shelved. Even though a user refers more than one article in a print journal, the title will be counted only once. But each use of articles within the same electronic journal (even by the same user) is recorded as a separate use. Franklin (2005) has compared a few studies based on the Montgomery (2000) concept at different libraries.

A preliminary study was conducted by Sathe, Grady & Giuse (2002) to investigate the effect of journal format on research purposes. Their analysis indicated that fellows, students and residents preferred electronic journals and that faculty preferred print journals. Patrons used print journals for reading articles and scanning contents. They used electronic journals for printing articles and checking references. Patrons considered electronic journals easier to access and search than print journals. However, they reported that print journals had higher quality text and figures.

### ***The Periodicals Collection at the Library of the University of Moratuwa***

As a principle, the Library of the University of Moratuwa has made all purchasing of

subject materials according to the recommendations of the respective departments of the University. This applies to all recommended text books, as well as periodicals. Recommendations are made by the department heads or lecturers.

Presently, the library holds a collection of 1562 current and earlier periodical titles which include both print and online formats. Among these titles there are 638 print periodical titles, out of which only 69 titles could be considered as current print titles. All the back issues of remaining print titles are available on the shelves that are arranged according to the alphabetical order of the titles. Online periodicals included 906 journal titles, purchased from 05 online databases and some individual journals. Also, the library has subscribed 18 periodical titles which offer both print & electronic versions.

The Library has provided access to many online resources since 2003. In the beginning of 2003, the IEE initiated giving access to online versions of their journals, along with print subscriptions, on a complimentary basis. Under this scheme, the Library of the University of Moratuwa gained access to 17 journals in 2003. The library started to purchase online databases in 2004 with two databases other than IEE. Also from 2005 to 2008, the library gained free access for 5 online databases and 4 academic publishers' web sites under the PERI (Programme for the Enhancement of Research Information) project with SIDA/SAREC funds.

In the year 2010, the library subscribed to 5 full text databases and 29 individual online journals and magazines. Out of these, 18 titles have both online & print formats for use. ACM Digital Library, Emerald, IEEE Explore, Grove Art Online and Science Direct are databases that are available during the period of the study. Due to budgetary constraints, the Library of the University of Moratuwa is not in a position to purchase all the modules of the above databases. Sections or some modules of the databases have been purchased according to the requirements. Only the engineering and environmental modules of ScienceDirect database provide access to patrons. Also, the Emerald Management Xtra 175 package of the Emerald database and the ASPP package (All Society Periodical

Package) of the IEEE database are the other database packages available for the research community of the University of Moratuwa. The electronic resources of the library are easily accessible for all undergraduate students, postgraduate students and staff members within the University premises.

### ***Purpose of the Study***

As periodicals are the most costly resource in the libraries, it is essential to identify the usage level of both print and online periodicals. Libraries should give a clear assurance to the higher authorities of the University, in order to ensure that the funds utilized for periodicals are not wasted. Even though the Library of the University of Moratuwa has subscribed to both print and online periodicals for few decades, no study has been conducted to evaluate the usage of periodicals. Therefore, the objective of this study is to ascertain the usage of both print and online periodicals recommended by the academic members of the University of Moratuwa and to calculate the subscription cost per use.

### ***Methodology***

The case study method was adopted in this study. A list of periodicals available during 2010 and their subscription cost were obtained using the automated library management system. The data on print and electronic volumes of 121 titles (05 databases, 29 online only journals, 18 online & print journals and 69 print only journals) were gathered for a period of six months, from February to July 2010. Data on electronic use were obtained from publishers' usage statistics. Only full-text journal article downloads were considered for electronic periodical usage. Usages of the print volumes were tracked by marking used journal volumes in a pre-prepared table on a paper during the re-shelving process. All the print periodical titles available in the library were included in that pre-prepared table. In addition, all the dates of the particular month were displayed in the pre-prepared table. The person involved in re-shelving of used print periodicals was advised to mark the number of periodical titles left on the tables, before they were re-shelved. This process was continued three times a day during the period of the study. As the print journal volumes are available in the open stacks, it is possible that some usage data were missed when users did their own re-shelving. Users were advised not to re-shelve the periodicals

and notices were displayed on each table in the periodical division requesting library users to keep all the materials on the table after use.

### **Results**

Table 1 shows the availability of print and electronic periodical titles during the period 2006 – 2010. The number of print journal titles has gradually decreased from 2006 to 2010. One important feature in this migration of print to electronic materials is the non-availability of any print periodical in the year 2010 due to the lack of funds.

**Table 1: Subscribed periodical titles (2006-2010)**

<i>Type</i>	<i>2006</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>2010</i>
<b>Print</b>	105	104	100	69	–
<b>Online</b>	825	95	812	851	877
			01 (IndividualJ.)	07 (IndividualJ.)	29 (IndividualJ.)
<b>Print+Online</b>	–	20	18	33	18
<b>Total</b>	930	219	931	960	924

There has been a gradual increase in the number of subscribed online journal titles during 2006-2010. The majority of the online journals belong to few subscribed online databases. The list of subscribed online databases and the number of journals available in those databases are displayed in table 2.

**Table 2: Number of journals available in online databases (2006- 2010)**

<i>Database</i>	<i>2006</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>2010</i>
ACM Digital Library	290	-	290	290	290
Emerald	119	95	95	150	175
IEE	17	20	-	-	-
	(Print+Online)	(Print+Online)			
IEEE	118	-	135	120	120
ScienceDirect	281	-	292	291	292
				01	
				(Print+Online)	
<b>Total</b>	<b>825</b>	<b>115</b>	<b>812</b>	<b>852</b>	<b>877</b>

Other than the journals offered by the databases, there are some individual online journals purchased according to the requirements of the departments. In 2006 and 2007, individual journals were not purchased. Due to the poor budget allocation in 2007, the library was able to purchase only two electronic databases. In 2010, there were 29 individual online journals, other than the journals available in the databases. Journals which have both online and print formats are also available at the Library of the University of Moratuwa (18 titles in 2010). From 2006 to 2010, the library continued with the same databases as online resources other than the IEE database. It was discontinued in 2007 due to low usage, even though it offered both print & online journals.

As an accepted norm, the cost of periodicals have increased year by year (generally by 5% annually) and libraries have to spend an increasing percentage of their budgets for purchasing periodicals (PURCEL 2000, cited Kidd 2002). The Library of the University of Moratuwa spent Rs. 3.5 million in 2010 for the purchasing of books, out of which Rs.17 million was spent for purchasing periodicals. This is an increase of almost Rs. 9 million (116%) when compared to the year 2006. Table 3 highlights the library cost for each

periodical format from 2006 to 2010.

**Table 3: Subscription cost for periodicals (2006 – 2010)**

<i>Resource Type</i>	<i>2006</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>2010</i>
Print	1.937	7.646	2.144	1.868	-
Online	-	-	0.746	3.152	5.248
Print+Online	-	-	2.813	2.877	1.284
Online Databases	6.024	1.987	2.043	9.039	10.601
<b>Total</b>	7.961	9.633	7.746	16.936	17.133

\*Values are in Sri Lankan Rupees (millions)

In 2010, the Library of the University of Moratuwa subscribed to 5 online databases, 29 online journals and 18 online + print journals. The Library reduced the purchase of print only journals in 2009 and increased the number of online journals and print + online journals. This was further increased in 2010. Therefore, the cost of the electronic resources has shown remarkable growth in 2010.

According to Kidd (2002), when comparing the usage statistics, it is important to achieve some uniformity across the statistics available from different sources. He has highlighted that the viewing of a full-text article would probably be the most meaningful single statistic which should be recorded. In this study at the Library of the University of Moratuwa, electronic journal usage is defined as an article view, accessing or downloading HTML or PDF files. For determining the usage of print journals, the library maintained a record of titles which included a re-shelving count of bound and un-bound periodical titles. As Montgomery and King (2002) mentioned, there are problems in comparing only the subscription cost of the periodicals. But libraries could adopt this kind of analysis as a preliminary study to identify the usage levels of the periodicals.

**Table 4: Cost per use of online databases (Feb – Jul 2010)**

<i>Database</i>	<i>Subscription Cost (Rs)</i> <i>(million)</i>	<i>Usage</i>	<i>Cost per Use (Rs)</i>
ACM Digital Library	0.568	477	1192.00
IEEE	5.254	5,405	972.00
ScienceDirect	3.258	9,247	352.00
Grove Art Online	0.266	1,691	157.00
<b>Emerald</b>	1.252	11,234	112.00

The subscription cost per use of online databases for February – July 2010 is displayed in table 4. According to the results, the ACM Digital Library has the maximum subscription cost per use. All the other databases have a unit subscription cost less than Rs. 1000. Emerald has the lowest subscription cost per use that is Rs. 112. These figures could be further compared with the document delivery cost of the articles. The Library of the University of Moratuwa offers this service with the collaboration of the British Library Center and Service called the BLDS (British Library Document Supply). In 2010, the cost of an article delivered through BLDS service was \$ 10.50 (Rs. 1800). All the databases have cost per use values less than Rs. 1800. Generally the average subscription cost per use for the databases is Rs. 378, which is much lower than the purchasing cost of articles through British Library Document Supply (BLDS).

**Table 5: Cost per use of online journals (Feb – Jul 2010)**

<i>Online Journals</i>	<i>Cost per Use (Rs.)</i>	<i>Online Journals</i>	<i>Cost per Use (Rs.)</i>
Construction Innovation	139.00	Journal of Urban Design	2,909.00
International Journal of Project Management	246.00	Computers Environment and Urban Systems	2,917.00

Journal of Financial Management of Property and Construction	312.00	Journal of Hydrology	4,221.00
Building & Environment	525.00	Planning Theory and Practice	5,197.00
Energy & Buildings	531.00	Construction Management & Economics	1,283.00
Building Research & Information	984.00	Progress in Planning	8,434.00
Canadian Journal of Civil Engineering	1,153.00	Technological Forecasting and Social Change	8,776.00
Canadian Geotechnical Journal	1,223.00	Transportmetrica	10,046.00
Energy	1,406.00	Planning Practice and Research	10,104.00
Habitat International	1,565.00	Journal of Bone and Joint Surgery British	11,426.00
Transportation Research Record	1,565.00	Journal of Design Research	12,096.00
Cities	1,865.00	International Journal of Heritage Studies	17,307.00
Journal of Air Transport Management	2,051.00	International Journal of Technology Management	47,956.00
Journal of Engineering Design	2,156.00	Earthquake Engineering and Structural Dynamics	622,340.00

Table 5 displays the subscription costs per use for 28 individual online journals. The publisher of one online journal (Cost Engineering) was unable to provide the usage statistics for its journal. Also, these usage statistics highlight many critical issues to the librarians for finding immediate solutions. Only three online journals have a subscription cost per use less than Rs. 500. There are 16 online journals which have unit subscription costs higher than Rs. 2000 per use. Out of 28 online journals, there are 07 journals having a unit subscription cost of more than Rs. 10,000. The subscription cost for International Journal of Technology Management is Rs. 47,956. Also the subscription cost per use for Earthquake Engineering & Structural Dynamics is almost equal to the subscription price of the journal (Rs. 622,540).

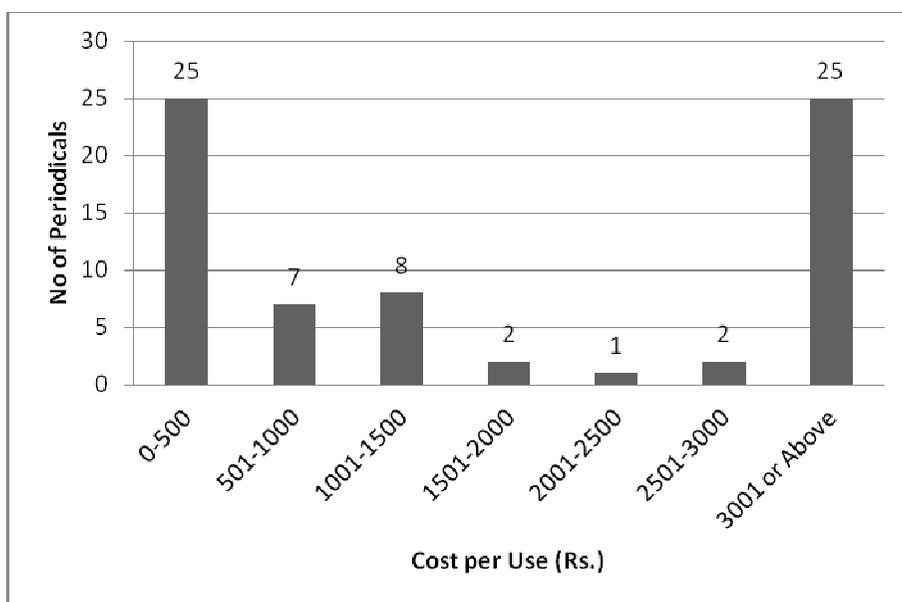
**Table 6: Cost per use of online + print journals (Feb – Jul 2010)**

<i>Online + Print Journals</i>	<i>Cost per Use</i>	<i>Online + Print Journals</i>	<i>Cost per Use</i>
Environment & Planning B: Planning & Design	126	Proc. Of ICE: Geotechnical Engineering	6,204
The Structural engineer	134	Geotechnique	7,057
Architect's Journal	535	Proc. Of ICE: Ground Improvement	7,582
Proc. Of ICE: Civil Engineering	1,574	Magazine of Concrete Research	23,932
Architectural Research Quarterly: ARQ	1,603	Proc. Of ICE: Structures & Buildings	24,447
The Economist	1,840	Open House International	29,915
Traffic Engineering & Control	1,930	Proc. Of ICE: Maritime Engineering	36,670
Proc. Of ICE: Bridge Engineering	2,369	Fairplay Magazine	42,533
Engineering News Record	3,231	Textile Outlook International	69,600

The situation becomes more serious with print + online journals. Patrons had two formats for accessing these journals. But neither format has been utilized effectively by them. The subscription cost per use for online + print journals is displayed in table 6. Only two journals have been used extensively indicating a subscription cost per use that is less than Rs.500. There are 09 journals which have subscription costs per use between Rs. 1,000 – Rs. 8,000. The most critical problem occurs in the journals which indicated subscription cost per use of more than Rs. 20,000. There are 6 such journals in this category. The cost per use of all these journals is almost their subscription price.

Print periodical usage also has the same problem at the Library University of the Moratuwa. Figure 1 displays the cost per use of current print only periodicals. In this study, print periodicals that were subscribed in 2009 were considered as current periodicals because no print periodicals were subscribed in 2010 due to inadequate funds. But the library planned to renew all 2009 print periodical titles in 2010. Therefore, all the print periodicals subscribed in 2009 were considered as 2010 periodical titles. There are 25 periodicals with subscription cost of less than Rs. 500. The lowest unit cost is

Rs. 7 for Wijeya Pariganaka magazine. The first five periodicals which had lower subscription costs per use are general magazines such as, Wijeya Pariganaka, Loris, Explore Sri Lanka, Reader's Digest and Muthuhara. The most significant feature is that the users preferred to read general magazines than the subject specific periodicals recommended by their departments. There are 25 periodicals which indicate a subscription cost per use of more than Rs.3000. Nineteen (19) journals having the subscription cost per use of more than Rs. 10,000 is a critical issue and librarians should re-think about the choice of periodical selections.



**Figure 1 : Cost per use for print periodicals (Feb – Jul 2010)**

### ***Discussion***

Usage statistics are important for any library resource. They can be used for deciding the budget allocations of the library and for the collective development process as statistics indicate the level of marketing efforts that should be applied by the library staff to promote the usage of different library resources among users. The results of the study demonstrate a clear picture to the library on how patrons use print and electronic journals differently.

Journals available in online databases have experienced a higher usage than journals in print only format, online + print format and only online format. It is observed that periodicals recommended by academic members for different courses do not have much effect on the usage. Many postgraduate courses conducted by the departments of the University have a research component as well. In addition, all the undergraduates in the University have to conduct research and submit a research report at the end of their fourth year as their final year research project. Journal articles are essential and important elements in any kind of research reporting. Students should refer to journal articles extensively for research purposes. If the periodicals available in the library are recommended materials, there should be a distinct usage for each periodical title. But this has not occurred for the majority of the journals available at the Library of the University of Moratuwa.

Punchihewa and Kodikara (2010) conducted a study to examine the usage of recommended books at the Library of the University of Moratuwa. The study highlighted a problem with the recommended text books. It was found that 13.8% of recommended book titles had zero usage. In this study the researcher observed 21 print journal titles which indicated only one instance of usage during the period of the study. The same situation was observed with online journals. There are 6 online only journals having a total usage of less than 10. The problem becomes much serious with the print + online journals. There are journals using neither printed nor electronic format. If the library purchases the articles downloaded from these online journals through the BLDS (British Library Document Supply), it would cost a much lower amount compared to the prices of the journals. This is a critical issue for the library.

The majority of the students being unaware of periodical resources is another critical factor. Punchihewa (2008) noted that the majority of patrons have used a limited number of electronic resources due to the lack of knowledge of available resources. Punchihewa (2008) has also highlighted that the majority of the patrons have very limited knowledge regarding the scope of electronic databases and journals. The Library has to pay serious

attention to this matter and seek immediate solutions to promote periodical resources among the students. The Library the University of Moratuwa conducts a comprehensive orientation programme for new students. But it's apparent that extra training programmes related to the scope, coverage, search and retrieval facilities of the e-resources are required for more effective promotion of this aspect. Also, the departments should emphasise that students should use a large number of scholarly journal articles in their research. Information on current trends and developments in any field is available in scholarly journal articles. Therefore, inclusion of research articles should be an essential requirement in student research reports.

Many online resources are given IP based access, allowing the use of these electronic materials within the premises of the University. According to the study conducted by Punchihewa (2008), postgraduate students have more difficulties in accessing library materials. The lack of time to come to the library was the most prominent reason for the minimum usage of materials by the postgraduate students. Most postgraduate students are employed and most postgraduate courses are conducted on a part time basis or as weekend courses. Therefore, the majority of the postgraduate students have very limited time to spend in the library or university. Therefore, it is a critical issue for them to find the time for accessing electronic materials within the University. The Library should give serious consideration to promoting a mechanism for providing remote library access to their users with the aid of IT specialists.

As mentioned by Punchihewa and Kodikara (2010), the lack of collaboration between the faculty and the library has directly affected the low usage of recommended materials. Presently no library member is participating in the preparation of the curriculum of any department. This has minimized the opportunity for the academic members to share their experiences with the library academics. Table 7 shows the average amounts of subscription cost per use for each periodical type. According to the Table 7, online databases have the lowest subscription cost per use and online + print journals have the highest subscription cost per use. The average subscription cost per use for all the

periodical material is Rs. 549.00.

**Table 7: Average subscription cost per use (Feb – Jul 2010)**

<i>Periodical Type</i>	<i>Subscription Cost (Rs)</i>	<i>Total Usage</i>	<i>Subscription Cost per Use (Rs.)</i>
Online Databases	10,601,146.00	28,054	378.00
Online Journals	5,477,522.00	4,111	1,332.00
Online + Print Journals	1,274,155.00	1103	1,155.00
Print Journals	1,896,079.00	1,815	1,045.00
<b>Total</b>	<b>19,248,902.00</b>	<b>35,083</b>	<b>549.00</b>

### ***Conclusion and Recommendations***

This study is based on the usage of subscribed periodical materials in the Library of the University of Moratuwa. The result of the study suggests that many factors should be considered before recommending and purchasing any periodical material. The Library should conduct orientation programmes, workshops, presentations etc. for promoting the periodical materials at appropriate times for students. The library should also provide a clear idea to patrons about the availability of print only titles and online titles. Designing a proper mechanism to provide remote access for online materials should be another main objective of the library.

Academic staff members of the University should seriously consider the relevancy of periodical recommendations. They have the responsibility of guiding the students to use more scholarly journals articles in students' research.

The Library academics should also be members of the curriculum designing committees of the University. As mentioned by Punchihewa and Kodikara (2010), the Library must act as a liaison for the faculties and departments of the University. The Library and the departments should always review the usage of periodical materials annually. Such

collaboration between the library and the departments should be further strengthened. Librarians should have frequent communications with academic members of the University regarding the usage of periodical materials.

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