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Commercial versus Open Access: Use of E-Resources among Engineering Academics in Sri Lanka

Abstract

Engineering Faculties in Sri Lankan universities are somewhat adequately equipped with IT facilities and e-culture where most students and academics use the network environment for their scholarly activities. Some faculties have introduced online courses, online tutorials and online submission and evaluation of assignments. In this context the purpose of this article is to explore the information seeking behavior of the academics of the engineering faculties in Sri Lanka towards the utilization of electronic resources for their teaching, learning and research needs. An investigation was made to identify the extent of using commercial e-resources and open-access e-resources to fulfill their information needs. The methodology occupied in this was the sample survey, where the samples were selected on a cluster basis from academics in the Engineering Faculties of the University of Ruhuna, University of Peradeniya and University of Moratuwa. A structured questionnaire was used to gather data from the sample and telephone conversations, e-mail discussions and interviews with the librarians were made in order to verify the data collected from the sample. Web pages of the selected libraries were also examined and reviewed in order to ascertain the availability of access points/links to e-resources through their homepages. The results indicate that the use of electronic resources among academics is high and engineering academics fulfill their information needs mostly through open-access e-resources than commercial e-resources because access to commercial e-resources is costly and their access facilities are complicated in the country. Academics obtain commercial e-resources mostly from personal purchasing or from other channels than from the library. Libraries have been unable to provide a satisfactory amount of e-resources due to the lack of funds. It seems that engineering academics poorly use the resources provided under programmes like INASP. The majority of engineering academics do self-searching to locate information from the internet. Yet, the use of searching mechanisms and tools has been centered upon a particular set of popular tools. The study emphasizes that libraries of universities should encourage their patrons to use OA resources and should conduct programmes to develop their awareness for them.

Keywords

Commercial e-resources, open-access e-resources, information seeking behavior, information literacy, engineering faculties of Sri Lanka

Introduction and background

The behavioral patterns of using e-sources among academics of universities in the modern day seem to be rather complex and diverse depending on the type of required information, nature of information seeking techniques, the availability of infrastructure facilities and the level of information literacy/skills of the user. Rapidly innovative and sophisticated information technologies have changed the nature of using information. Specially, the explosive growth of the internet, and the availability of web resources have been much more influential in the process of teaching, learning and research. The emergence of various types and modes of communication media has made education more challenging and interesting. Digital resources are comprehensively replacing the conventional print resources at the library while many libraries strive to maintain hybrid collections in both print and electronic formats. Many publishers trend to produce their publications in both formats print and electronic simultaneously.

Electronic resources are popular among scholarly communities because of their quick accessibility, ability to multiple ‘on-campus’-‘off-campus’ login, and the sophisticated facilities associated with them such as hypertext, multiple formats and multimedia. Electronic publications are seen in various types and formats such as CD ROM databases, DVD ROM databases, online databases, e-books, e-journals, weblogs, Wikis, and institutional e-repositories. Contents of e-databases also have shifted from bibliographic mode to full-text mode where the text, graphics, sound, and video are linked to the document online or offline.

Teaching, learning and research in the modern world become almost imperfect if they do not involve the use of e-resources influenced by the latest information of day. The internet has become the most dominant information provider today while an enormous amount of information is independently uploaded to the net every hour. The most challenging issue in this circumstance is to select and filter the relevant information in an accurate form. It is discerned that there are difficulties for students as well as staff of the faculty to select and retrieve the relevant information effectively from the net. They need the help of the library. A study conducted by Heterick Bruce (2002) in the United States reveals that 60% of academics were comfortable with electronic resources and 48% of them were very dependent on the library for their research.

Library’s role also has dramatically changed due to the emergence of sophisticated methods of using information. The change of educational styles with the networked environment has provoked scholarly communities to seek for quick and instant, preferably, on-the-spot access to information. “Modern libraries have evolved from paper-based storehouses of books and journals into distributed networks of digitized information and knowledge now known as digital libraries” (Karanjkar 2010). In addition to acquiring paper-based information sources, academic libraries have to conglomerate electronic resources and facilitate users with retrieving, downloading, and accessing information quickly and easily. It is required to

educate and train users to develop their information gathering skills where they are enabled to identify, select, filter, evaluate and synthesize information from the internet.

“Information is accessible from a wide variety of globally distributed commercial repositories such as electronic publishers and aggregators with access charge. However, it is also accessible from open access journals, open access archives, few websites and institutional repositories free of charge. Now libraries can enable world wide access to a never-ending supply of distributed information and knowledge in electronic form that is constantly available, easily updated and convenient to use” (Karanjkar 2010).

Academic libraries today are using various strategies to help their clients effectively access many electronic resources for their information needs. Some of these strategies include:

- a. Building digital libraries by converting print mode resources to electronic mode.
- b. Purchasing access licenses to commercial databases, e-books and e-journals to the library via direct purchasing or consortia purchasing.
- c. Constructing Institutional e-repositories to aggregate digitally born knowledge resources locally by encouraging scholars/authors to self archive or deposit their knowledge products under compulsory or legal deposit policies.
- d. Maintain web pages, weblogs, subject gateways, web portals or virtual libraries with creating links to Open-Access e-resources available online or offline.
- e. Educate and train users to develop their information literacy skills in order to easily and effectively locate, filter, retrieve and synthesize information from Open-access resources.

However, this should be performed in collaborative basis where librarians, IT personnel and administration work together with the consideration of information seeking behavior of users.

Purpose

The purpose of this study is to explore the information seeking behavior of academics of the engineering faculties of the Sri Lankan universities toward the use of electronic resources for their teaching, learning and research needs. Here it is aimed to investigate whether the engineering academics use electronic resources and the extent of using commercial e-resources and open access e-resources to fulfill their information needs. Attempts have been made to identify what commercial e-resources they use and how they search for open-access e-resources from the library and the internet.

To achieve the above purpose following research questions were addressed.

1. Whether the academics of engineering faculties of Sri Lanka fulfill their information needs using Commercial E-resources or Open Access e-resources?
2. And why?
3. How can librarians support them?

Methodology

This study occupied a sample survey using an exploratory survey method. The samples were selected on a cluster basis from academic staff members of the engineering faculties of

University of Ruhuna, University of Peradeniya and University of Moratuwa. Attention was focused on engineering faculties simply because they are equipped with better IT environments compared to the other faculties and the staff and the students in them tend to use digital resources more frequently than those in others. Most engineering academics have a good knowledge of computer applications and the use of Internet as a reference tool for their professional activities. The Samples were limited to three departments - Electrical Engineering, Mechanical Engineering, and Civil Engineering - to ensure the homogeneity of the sampling. These departments are commonly available in the selected universities. The Engineering Faculty of the Open University of Sri Lanka was not selected as the structure and the procedures of the instructions in that faculty are quite different from those in the other universities.

The main tool to gather data was a structured questionnaire focused on the types of e-resources, the purposes of their use, and the ways in which they are accessed. The questionnaire was posted/e-mailed directly to the respondents and telephone conversations and e-mail discussions were held with them in order to verify the data. Further, interviews were made with the librarians of these faculties to ascertain the availability of commercial and open access e-resources through their libraries and to refine and reinforce the data gathered in that manner. Even the web pages of the selected libraries were examined and reviewed in order to ascertain the availability of access points/links to e-resources through their homepages. Finally, the data were analyzed using simple methods like percentage analysis and mean analysis while graphical figures were used to visually present the findings.

Definitions of terms:

E-Resources - are the information sources available in electronic form. These resources may be published as CD ROMs, DVD ROMs, computer files, or any other digital resource accessible online or offline. E-journals, e-books, e-databases and Web-blogs are some examples of e-resources. "A library Web-site can function as an information gateway or an entry point to arrange online resources, with key components being the library catalogue and journal databases" (Johnson, Trabelsi and Tin 2005)

Commercial e-resources - are the information sources published or aggregated by a person or organization for the purposes of providing users access to the resources as an income-generating venture. Commercial publishers hold the copyright of the resources and provide access licenses through direct purchase or subscription for a period of time. This can be "virtually any electronic product or service for which libraries spend funds" (Jewell T.D. 2001).

Open access e-resources - are the information sources which are available in electronic format, accessible online, free of charge and mostly free of copyright. Some e-resources require registration for licensing. "By 'open access' to this literature we mean its free availability of the public internet, permitting any user to read, download, copy, distribute, print, search or link to the full text of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal or technical barriers other than those inseparable from gaining access to the internet itself. The only constraint for reproduction and distribution, and the only role of copyright in this

domain, should be to give authors control over the integrity of their work and the right to be properly acknowledged and cited” (Budapest Open access Initiative, 2002).

Use of e-resources in Sri Lanka

The use of electronic resources has increased highly among university academics in Sri Lanka, researchers and scholars since the last decade. Most universities and academic institutions strive to develop an e-culture in their institutions by developing their infrastructure facilities as well as attitudes. Many teaching and learning modules are being converted to e-formats, and many administrative and managerial activities are being connected to an e-environment. Several Engineering Faculties have introduced e-learning modules for undergraduates and tutorials can be accessed via the intranet. Some faculties practice online submission and evaluation of assignments in a networked environment and some conduct tests and examinations using the intranet. Some of the universities in the country have quite sufficient internet access facilities with a high band-width, LANs (Large Area Networks), and in some cases Wi-Fi connections to facilitate the community with a networked environment.

Many university libraries have automated their circulation, acquisition and housekeeping processes and OPACs (Online Public Access Catalogue) have been built up to facilitate the users with a bounder-less access to their holdings. Some engineering faculties have purchased access licenses to commercial e-databases related to engineering disciplines. Journal articles and other e-resources are shared among the faculties under Inter Library Loan schemes. The resources are also shared among the libraries with the help of social media such as ‘Library Friend’ e-mail group, and Facebook. Some faculty libraries have also joined free access programmes like INASP- PERii, SLJOL and some, have the joined the programmes like consortia purchasing of commercial journals and databases.

Several university libraries have initiated Institutional Repositories (IR) so that authors and scholars of the universities can self-archive their publications on them. All the Engineering Faculties have a satisfactory number of computer centers to accommodate the students in accessing the internet and almost all the academic staff members have been provided with a PC or Laptop computer.

As all the government universities are depending on the funds annually allocated by the government, their libraries are receiving insufficient funds to purchase access to commercially published e-resources. Therefore the librarians have to face numerous difficulties with the gradually decreasing allocations and rapidly increasing prices for books and periodicals. To face this challenge libraries have to strengthen their resource sharing and consortia programmes.

Librarians can also encourage users to seek for open access resources and make them aware of the freely available resources in their respective disciplines. Also they can empower their users in finding and using open access resources.

The University of Moratuwa has purchased a limited access license for several databases such as ACM Library, Emerald, Grove Art Online, IEE Xplore, ScienceDirect and Scopus with outside funds. Articles from these databases can be shared with other libraries on request.

Covey (2003) reveals several steps that librarians should take in terms of closing the gap and removing the barriers between commercial vendors and academics, and facilitating convenient and easy access to quality resources. Some of them are: 1. redesigning the website of the library to improve navigation; 2. endeavoring to reduce turnaround times in services; 3. empowering users with direct browsing tools and tracking mechanisms; 4. marketing the resources to target group through portals; 5. providing proxy servers or virtual private networks to intercept transactions between users and real servers to address the IP range restrictions by vendors.

Findings

The aim of this study was to explore the nature of using electronic resources among engineering academics of universities of Sri Lanka and to find out whether they use commercial and open access e-resources to fulfill their information needs. Proportionately, the samples from the engineering faculties of the universities of Ruhuna, Peradeniya and Moratuwa were analyzed using the simple statistical methods such as percentage and mean value analysis in due circumstances. Interviews with librarians of respective faculties were made to identify the nature of subscription to e-resources, the extent of links available to open access e-resources through their web pages and the nature of awareness programmes available in their faculties. Web pages of these libraries were also examined to recognize the facilities available for users to access e-resources. The questionnaire designed for the academics was aimed to gather data related to the types of academic activities engaged by the respondents, the places where they find information to perform their tasks, the purposes of their information seeking, their preference mode of information sources, and the use of commercial e-resources as well as open access e-resources for their needs.

It was also examined if the respondents were satisfied with the facilities available in the library to access e-resources. Focus was also given to identifying the searching tools of respondents and whether the academics have understood the structure or organization of the categories of e-resources available on the internet. The use of e-resources provided under cooperative programmes /consortia programmes was also examined. The study attempted to identify the search engines and searching mechanisms used by engineering academics and the extent of using selected commercial e-resources and open access resources in the fields of engineering.

Information is essential for academics to perform tasks related to teaching, learning, research, writing of textbooks, and curriculum planning in their subject areas. According to this study, 100% of engineering academics engage themselves in teaching, 91% in research, and 26% in writing textbooks and curriculum designing. This means that they need a great deal of information resources related their subject fields.

The university community is always involved in interpreting and creating new knowledge. Therefore, it is important that knowledge sources are made available for them. This study attempted to investigate where the engineering academics locate the information they require. The results indicate that 95% of the respondents use the internet for it while 5% of them use only the library and 31% of them use personal collections. This implies that the majority of the academics use all these three channels - the library (73%), personal collection (66%), and the internet (95%) to find the information they require for their activities.

The use of information extends on various purposes: 91% of the respondents seek information for preparing teaching materials; 94% of them for their research and studies; while 17% of them for administrative purposes. The rate for recreational purposes is 20% and that for other purposes is 2%.

In relation to the preference of information sources 58% of academics prefer printed resources while 35% of respondents do e-resources. 7% of respondents had no preference and they concentrated on the context rather than the form of resources. On the other hand 50% of the academics use both printed and electronic resources depending on the availability of access. This indicates that a large number of academics still prefer print sources as they find them more comfortable with hard copies (figure 1).

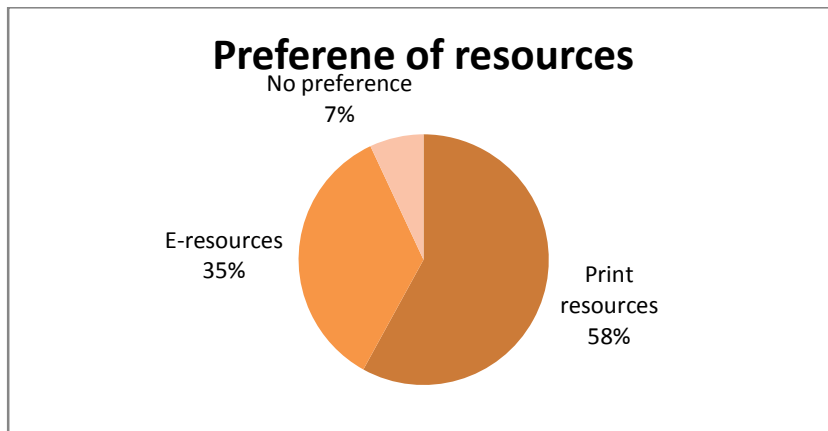


Figure 1 – Preference of resource formats

However, adapting to the e-culture 97% of engineering academics use e-resources. 29% of them are mostly relying on commercial e-resources while a satisfactory amount of academics (70%) seek for information from OA e- resources. This may be due to non availability of access to sufficient amount of commercial e-resources through the library. The practical trend is that the academics use both according to the level of availability of them (see figure 2).

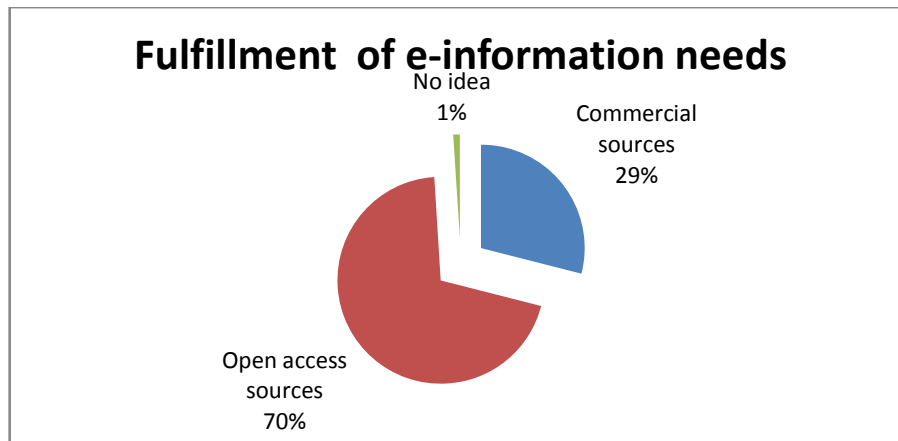


Figure 2 – Where to find e-resources

Commercial e-resources are obtained by 29% of respondents through their personal purchasing while 23% of respondents get them through the library of the faculty and 47% of respondents find alternatives ways such as personal contacts, friends groups, social media etc. This indicates that libraries have to find and develop consortia programmes, inter library loan schemes, and other resource sharing activities to cater for the users with required information. The university libraries in Sri Lanka can also launch central purchasing with the help of the UGC and provide e-access to all relevant universities.

Users should have searching abilities and skills to locate OA e-resources from the internet. Most of librarians help users with educating them on how to find information from the net and how to identify public domain resources from the internet. According to this study 94% of academics obtain OA resources through self-searching and only 17% entertain support from the library.

The formats of e-resources might be different based on the purposes of using them and it is very important for a user to be familiar with them in order to locate the relevant OA materials. It was discovered that 94% of engineering academics search for journal articles, 64% for theses/dissertations, 64% for e-books, 55% for course materials, 20% for learning objects, 20% for data files, 8% for audio files, 8% for video files, and 29% for institutional records. These figures might be different depending on the types of the faculties, their disciplines, their course types and the facilities available in them (table 1).

Item type	% of users
Journal articles	94
Theses/Dissertations	64
E-books	64
Course materials	55
Learning tools	20
Data files	20
Audio files	8
video	8
Institutional records	29

Table 1 – Types of OA resources seeking for by engineering academics

The librarian of the faculty should have a thorough knowledge of the processes involved in locating the relevant resources so as to support the faculty communities. They can set up resource links, subject gateways, and digital libraries and conduct awareness programmes. An investigation was made by asking respondents whether they are satisfied with the involvement of the library in their search for e-resources. The responses revealed that 80% of academics are not satisfied with the facilities available at the library, while 11% of them are satisfied. Yet 35% of the respondents had no idea about it. Their levels of satisfaction may be different depending on the capacity of the university, and the subject coverage of the library's resource collections. For example 80% of respondents of Moratuwa University expressed that the facilities available at the library are sufficient (figure 3). These statistics imply that the librarians should take measures to increase the accessibility to e-resources and maintain a balanced collection of e-resources at the library while involving in the education of user to find free resources.

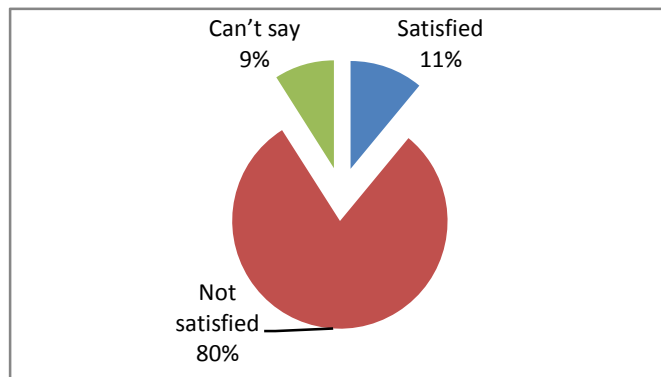


Figure 3 – Satisfaction of the support by the library

Information available in the Internet is organized under various categories with different structures and procedures. The understanding of these categories might be much helpful for users in locating and retrieving the relevant information effectively. According to this study, 41% of engineering academics access Digital Libraries constructed by various institutions, 47% access to e-databases to find their information, while 38% use institutional e-repositories to locate the information needed. The rate of using personal websites is 41% and the majority of the academics (64%) search for e-books while 20% access weblogs and 2% use 'RSS feeds' to find information but no one was found familiar with Listserv.

Wikis are the types of information sources which provide background information of a concept in a wide range. In this case, the percentage of respondents using Wikis is 47% and 29% of academics obtain their information through 'Discussion Groups' through the net.

'Subject- gateways' are a mechanism to aggregate e-resources virtually under one discipline and provide links to them on the internet. These are very important for scholars and researchers as they are often based on particular subjects. However, only 8% of engineering

academics search subject gateways to locate their information. Scholars can communicate information via P2P file sharing networks and the rate for using that facility is 2% (table 2).

Awareness/use of e-knowledge sources	
Digital libraries	41%
E-Databases	47%
Institutional Repositories	38%
Personal Websites	41%
Discussion Groups	29%
Wikis	47%
Subject Gateways	8%
P2P file sharing	2%
Weblogs	20%

Table 2- awareness of e-information tools among academics

The above statistics imply that academics of engineering faculties are mostly depending on familiar searching tools and majority of them are not aware of various tools that can be used to vary the search and broaden the result.

INASP (International Network for the Availability of Scientific Publications) is a programme to provide access to international scholarly literature, and has been contributed by many of librarians in Sri Lanka to provide scholarly information free of charge. This project provides access facilities to selected commercial e-resources and OA databases in order to improve the availability of information in developing countries. The majority of the university libraries have set up links with this facility. This study involves the exploration of using e-resources provided under INASP programme. According to the study 14% of respondents use this facility. Among them the database of the National Library of Sweden is used by 11% academics. Elsevier is by 47%, and Springer is used by 38% of respondents. According to these figures, resources provided through INASP are not well utilized. This may be because of lack of awareness or irrelevancy of these resources to the engineering fields.

The process of searching and retrieving of information can vary according to the type of the search engine used for navigating the internet. This study attempted to identify the search engines used by engineering academics. Accordingly, it was found that all the respondents use Google (100%). ‘AltaVista’ is used by 11% of them while Excite (2%) and Lycos (11%) are used by a few people (Figure 2). The results indicate that most of academics rely on popular search engines such as Google and not interested in other search engines due to lack of knowledge or unawareness of their different capacities and facilities. None of them use search engines such as [HotBot](#), [Dogpile](#), [Metacrawler](#), [Ixquick](#), [Profusion](#), [SavvySearch](#), [Vivisimo](#), [Mamma](#) or any other (see figure 4).

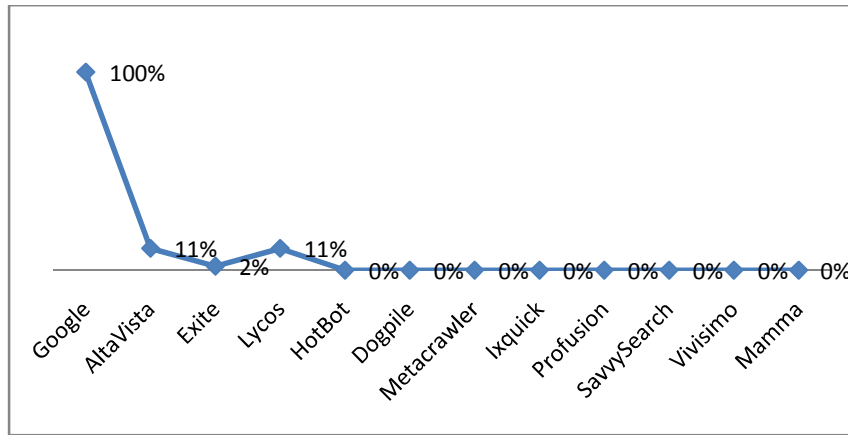


Figure 4 – Search engines used to locate OA resources by engineering academics

Journals are very important for teachers and researchers as they communicate the newest knowledge in the field. This study examined the use of selected commercial journals in the Civil, Mechanical and Electrical engineering fields and the result shows that the use of electronic journals was very low.

An investigation was also made to measure the use of selected commercial databases and OA databases. The highest rate of respondents used ‘ScienceDirect’ (64%) and ‘Scopus’ was used by 32% of respondents. In relation to the OA databases, most academics used DOAJ and SLJO. However, the majority of them do not seem to be aware of them (see table 2).

<i>Commercial</i>		<i>Open Access</i>	
<i>Elsevier</i>	47%	<i>Directory of open Access</i>	28%
<i>Springer</i>	38%	<i>MetaPress</i>	3%
ScienceDirect	64%	Official Journal of EPO	2%
Scopus	32%	Sri Lanka Journal Online	30%
National Library of Sweden	11%	Hinary	5%

Table 2– use of commercial databases and OA databases by engineering academics.

The tendency among engineering academics to use OA e-resources seems to be high because of the inadequacy of the commercial e-resources purchased by the university. The study involved an effort to test the users’ attitudes towards the use of OA resources. Here attention was focused on issues such as the ability to find out OA resources, relevance of OA resources to their subject areas, accessibility and reliability of OA resources, and the facilities available at the library to locate OA e-resources. The highest opinion received in this regard was that the library is not facilitating to find open access e-resources (mean score 20.4). Some academics (20%) also believe that they have no good knowledge on finding OA resources and it is very difficult to retrieve the relevant information from OA resources. Of the respondents 19.% believe that OA resources are not reliable and most of them are not relevant to their subjects. Figure 5 presents these details.

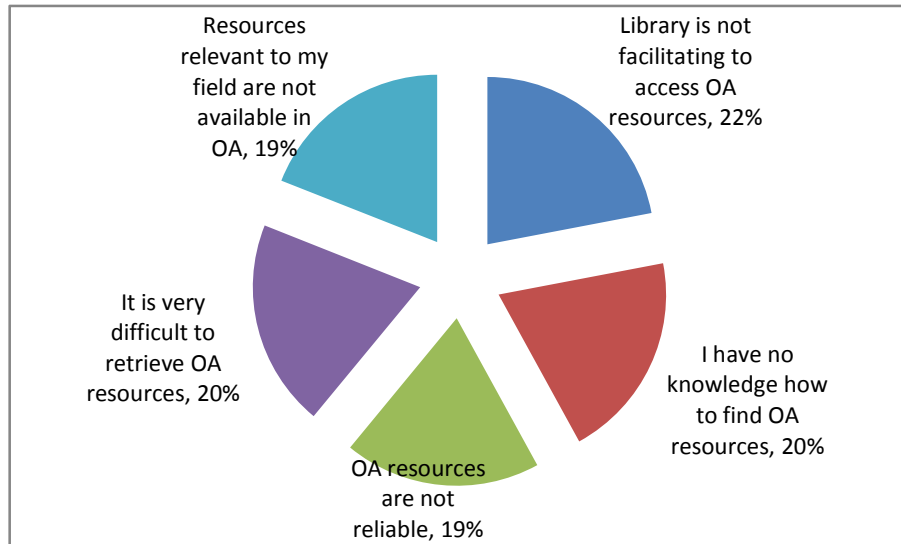


Figure 5– Attitude of engineering academics towards the OA resources

Homepages of the respective three libraries (Ruhuna, Peradeniya, and Moratuwa) were examined in order to identify the links available to access e-resources. The homepage of the University of Ruhuna Library has setup links to electronic resources under the sub-themes of *E-journals, Databases, Current periodical contents, e-books, Newspapers, Subject gateways, CD ROMs, Online Journals, Fulltext Journals on CDs, and Free Online Journals*. Yet some of them were under construction and most of the free journals were not supportive to the engineering curriculum of the faculty.

The University of Peradeniya library homepage has links to ‘electronic resources’ under the categories of *Databases, INASP/PERii resources, Free resources, Other websites, and E-resources in branch libraries*. Most of these links fail to logon and the subject coverage of the linked resources were not related to the engineering curriculum.

The University of Moratuwa library homepage had links under the heading of *e-resources*. There are connections to *ACM Digital Library, Emerald, Grove Art Online, IEEE Xplore, ScienceDirect* and *Scopus*. Yet, the searches were limited to abstract and bibliographic information. Passwords are required to logon to full-text resources and therefore, access was denied. They have either obtained password protected login facility or they have not purchased the access license. According to the interviews with the librarians the Universities of Ruhuna has purchased 09 e-journals of ASCE and ACI related to engineering fields. University of Peradeniya have not purchased access license to any commercial e-resources relevant to engineering and the University of Moratuwa has purchased access license to the above mentioned e-databases. However, it provided access only to some selected e-resources.

Conclusion

Although a considerable number of academics prefer to use printed mode information sources, there is a high tendency to use e-resources among academics of the engineering faculties of Sri Lanka. The engineering academics fulfill their information needs mostly through open access e-resources than commercial e-resources because access to commercial e-

resources is much expensive in the country. The academics obtain commercial e-resources mostly from personal purchasing or from other channels than from the library as libraries have not been able to provide a satisfactory amount of e-resources due to restrictions of funds and the librarians tend to go for consortia and resource sharing programmes to face this problem. It seems that engineering academics poorly use the resources provided under programmes like INASP due to unawareness as well as irrelevancy to their needs. The librarians also attempt to encourage users to find information through open access channels by setting links on web-pages and conducting information literacy programmes to develop awareness of them. The majority of the engineering academics do self-searching to locate information from the internet, yet the use of search mechanisms and tools has been limited to a particular set of popular tools rather than seeking a variety of search facilities with different searching tools. Librarians might arrange programmes to develop their awareness on various mechanisms and their benefits. Although the both commercial e-resources and OA resources are essential for academics depending on their contents as well as the relevancy to the purpose, open access e-resources are used by academics as an alternative to commercial e-resources. The autonomy of commercial e-resources can be controlled by encouraging professionals, scholars and knowledge creators to deposit their knowledge products in OA repositories. Specially, locally-born information resources can be gathered through Institutional Repositories and combine them with each other under a common protocol of fair use. Librarians have to play a dominant role in this regard.

Reference list

- Budapest Open access Initiative (BOAI). 2002. Budapest Open Access Initiative (Frequently Asked Questions) [online] (updated September 13, 2011) Available at: <http://www.earlham.edu/~peters/foa/boaifaq.htm#background> [Accessed 8 December, 2011).
- Covey, T. D. 2003. The need to improve remote access to online library resources: filling the gap between commercial vendor and academic user practice. Carnegie Melton University. 2003. Available at <http://works.bepress.com/egi/viewcontent.cgi?article=1037&context=den>: [Accessed December 09, 2011].
- Heterick, B. 2002. Faculty attitudes toward electronic resources. Educause review (July/August. 2002. Available at <http://net.educause.edu/lir/library/pdf/ERMO248.pdf> [Accessed 12 December, 2011]
- Homepage of University of Moratuwa. <http://www.lib.mrt.ac.lk> [Accessed 17 December, 2011]
- Homepage of University of Peradeniya. <http://www.lib.pdn.ac.lk> [Accessed 17 December, 2011]
- Homepage of University of Ruhuna. <http://www.lib.ruh.ac.lk> [Accessed 17 December, 2011]
- Jewel, T.D. 2001. Selection and presentation of commercially available electronic resources: issues and practices. Council on Library and Information Resources. Available at <http://www.clir.org/pubs/reports/pub99/contents.html> Accessed 29 November, 2011.

Johnson, K., Trabelsi, H., & Tin, T. 2005. Library support for online learners: e-resources, e-services and human factors In: : Athabasca University. n.d.. *Theory and practice of online learning [e-book]* Available through: Athabasca University <http://cdc.athabascau.ca/online_book/ch_14.htm> [Accessed 7 December, 2011].

Karajkar, N.S. 2010. Use of open access e-resources for management users. In: IMDR Institute of Management Development and Research. Available at <http://www.imdr.edu/Use%20of%20Open%20Access%20E%20Resources.html> [accessed 30 November, 2011]