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Trends in the Use of E-journals: A Case Study of PEC University of Technology, Chandigarh

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Introduction

Journals constitute an important part of a library collection being the most important vehicle for global scholarly communication. Tremendous developments in ICT in the recent years have given amazing boost to electronic publishing. As a result the information which is being generated at intense pace from all the directions world wide for all the themes is now being published in form of electronic journals (e-journals). Anyone with access to a computer equipped with a modem and suitable software can produce and distribute an e-journal through a computer network, thus journal publishing is being democratized. Usually, e-journals are published as electronic equivalents of their print counterparts but recently there is an increase in number of scholarly journals which are being published only electronically. As a result, e-journals have emerged as vital components of information resources of a library and play an imperative role in the distribution of prime information. E-journals have been defined in different ways by different authors. An early definition by McMillan (1991) described electronic journals as "any serials produced, published, and distributed via electronic networks such as Bitnet and the Internet." Ashcroft and Langdon (1999) stated that a journal, including indexing and abstracting services, provided by any electronic means, e.g. Internet, CD-ROM is called as e-journal. These journals are generally accessible electronically via web. Subsequently Smith (2003) gave a clear definition of e-journals as "any journal that is available online, including both electronic-only journals and journals that are available both electronically and in print". E-journal, hence, is a term used to describe a periodical publication that is published in digital form to be displayed on a computer screen.

E-journals are global information highways, so these are being added to library collections at exponential rates. Libraries are doing extensive work to make e-journals available to their users and keeping them abreast with latest developments in their field of interest. E-journals are accessible either free against print subscription or for a nominal charge along with the print subscription. Access to e-journals is generally provided either by the publisher or through their aggregators. E-journals have provided excellent opportunities to access scholarly information, which were previously beyond the reach of libraries due to geographical constraints. E-journals possess many added features for the

facilitation of libraries and its user community. These offer concurrent access to the scholarly content for multiple users. So these are boon for a huge campus where there are hundreds of users with many departments. Other features of e-journals include full-text search, multimedia facilities and hypertext links. Text search is much easier and less cumbersome. E-journals also include multimedia and graphics to attract readers. Also the hypertext available in the e-journals will directly link to the areas of greatest interest and results in creative reading. Maxymuk (2004) highlighted that advantages of electronic journals include no physical space required and accessibility from almost any workstation that can be connected remotely to the institution's network. Thus e-journals can be accessed round the clock across geographical barriers, which make e-journals omnipresent. The most fortunate thing about e-journals is that both libraries and users can conquer the problems of missing issues and delay in receiving the issues. To summarize, it can be clearly said that e-journals are truly a dream come true both for the librarians and users. Consequently libraries are now persuaded to subscribe to e-journals from a vast variety of publishers and providers.

Developments in Central Library, PEC University of Technology

The PEC University of Technology Chandigarh India was originally established as Mugalpura Engineering College at Lahore (now in Pakistan) on November 9, 1921. The name of the college was late changed to Maclagan Engineering College and it started functioning under this name on March 19, 1924. After partition in 1947, the college was shifted to Roorkee (India) and was renamed as East Punjab College of Engineering. In the year 1950, the word East was dropped and it came to be known by its present name-Punjab Engineering College. Towards the end of December 1953, the college shifted to its present campus in Chandigarh to function under Government of Punjab. In 1966, with the formation of Union Territory of Chandigarh, the college came under the control of the Govt. of India through the Chandigarh Administration. In October 2003, the Govt. of India notified the Punjab Engineering College as a Deemed to be University. Deemed to be Universities (Commonly referred to as Deemed Universities) represent a category of University – level institutions, unique to India, that have traditionally been respected for quality, relevance and diversity of their programs (Power, 2004). In fact it is a status of autonomy granted to high performing institutes and departments of various universities in India by University Grants Commission (UGC). These institutions enjoy the same academic status and privileges as a university. On 4th June, 2009 Punjab Engineering College (Deemed University), Chandigarh was renamed as PEC University of Technology, Chandigarh. The new name, adopted by the Board of Governors, embodies the new stature of PEC after grant of Deemed University status a few years ago. It also reflects the aspirations as well as the expansion of horizons of PEC in tune with its new status.

With a collection of more than one lakh volumes in Science and Technology, catering to the needs of about 2000 members (both Faculty and Students), imparting/pursuing studies in nine different branches of engineering, Central Library Punjab Engineering College (CL PEC) is rendering library services to its users from the time of its establishment and continuously trying to adapt new technologies so as to promptly fulfill the demand of the users. To keep its user community abreast with latest information in the technology, the CL PEC is subscribing to 78 technical journals (Indian and foreign) in the print form. At the same moment, CL PEC is exploring digital environment for better and fruitful delivery of information in the form of e-journals. CL PEC is member of Indian National Digital Library in Engineering Sciences and Technology (INDEST) Consortium under the Ministry of Human Resource Development (MHRD) since 2004. The MHRD has set-up the INDEST Consortium to promote electronic resources in engineering science and technology and provides funds required for subscription to electronic resources. The electronic journal service was introduced in the library in 2004, with the help of INDEST consortium. At that time PECUT library was providing access to more than 200 electronic journals of three commercial publishers: ASCE (American Society of Civil Engineers), ASME (American Society of Mechanical Engineers) and IEL (IEEE/IET Electronic Library) under the category of complimentary access for AICTE-sponsored institutions. In the year 2009, CL PEC subscribed to three more databases as demand for electronic resources increased. At present, CL PEC is providing electronic access to over one thousand journals published by learned societies as well as commercial publishers. Details are given in Table 1.

Table – 1: Journals accessible electronically

Sr. No.	Database	No. of journals accessible

1.	ACM Digital Library	32
2.	ASCE Journals	30
3.	ASME Journals	21
4.	IEL Online	219
5.	Science Direct	225
6.	Springer Link	525
	Total	1052

At CL PEC users are provided with a secured and hassle-free log on procedure via IP (Internet Protocol) activation. Users can access all the electronic resources through the Institute's IP ranges. This arrangement helps the user to access all the electronic resources immediately. This also keeps them free from memorizing user ID, Password, publishers URL etc. All the resources are available through campus wide network, but this arrangement restricts access to electronically available journal titles from within the university campus only.

Literature Review

E-journals have emerged as an effective means for scholarly communication. According to Chan (1999) e-journals provided many opportunities including multimedia capabilities, rapidity involved in their production, distribution and accessibility. She however remarked that both the library staff and the users should be provided with adequate training and support for the better usage of e-journals.

A survey of electronic journal usage at Ohio State University carries out by Rogers (2001) noted the increased use of e-journals and decreased use of printed journals by the faculty and the graduate students during 1998 to 2000. This study revealed that forty one percent of the faculty and twenty five percent of graduate students found round the clock availability and easy access as the major advantages of e-journals. Both the faculty and the graduate students noted that switching to e-journals would save space in the library and it would also be easier to incorporate e-journals into electronic presentations.

Flecker (2001) is of opinion that e-journals have become the largest and the fastest growing segment of the digital collections for most of the libraries in the past 2 or 3 years and in many ways, archiving and preserving e-journals will be dramatically different from what has been done for paper based journals. He stressed that the process must be funded by the governments through the national libraries or similar bodies, particularly for materials subject to copyright deposit.

In the study on readiness of researchers on the electronic only journal collection, Dillon and Hahn (2002) investigated the frequency of using scholarly journals (both print and electronic), and other electronic format used for accessing information at the University of Maryland. The study revealed increased level of adoption of e-journals among faculty, giving support to multiple formats for core disciplinary journals, and the differing perceptions of various constituencies among the respondents. The study suggested that the faculty is more interested in retaining print access to core literature as compared to the graduate students. The results provide collection managers with a better understanding of which journals make good candidates for initial adaptation to electronic only if archiving concerns can be addressed.

Hiom (2004) during her research found out that now-a-days students are more dependent on online journals for their research work and for satisfying their information needs. While sharing her own experience of accessing e-journals at primary stage, she highlighted technical difficulties while accessing e-journals as these need a special browser or plug-in software and the problem in viewing foreign language characters, as it is to be supplemented by change in the browser in order to view

them properly. In order to help this situation, she suggested that web needs to be much more structured and rigorous, which can provide right direction to the researchers.

Ali (2005) carried out an analytical study on use of electronic resources at IIT Delhi Library and laid emphasis on the training of library staff, which plays a major role in encouraging the use of electronic resources. He found that Boolean logic and truncation are most used search facilities. However, the users feel difficulty because of the lack of printing facilities and inadequate number of terminals, which discourages them from accessing e-journals.

A survey on users of a package of electronic journals in the field of chemistry was carried out by Borrego and Urbano (2007). They submitted that almost hundred percent respondents preferred PDF format for downloading the e-journal articles than the HTML format. The results provided the opportunity to better understand users' behavior for e-journals and established that this behavior does not vary significantly from that observed in studies undertaken in other geographical contexts. The results showed that there is a strong correlation between the number of articles downloaded and abstracts viewed of a title, so that the rankings of titles by articles downloaded and abstracts viewed are practically identical.

Madhusudhan (2008) is of opinion that e-journals perform an increasingly important role in research. His study showed that there is an ever increasing demand for subscriptions of more e-journal titles. There appears to be some need for academics to be provided with training in using e-journals. Majority of the respondents strongly attest to the fact that they need proper training/orientation for searching e-journals.

In conclusion the literature review infers that libraries through out the world are witnessing a transition phase from print to e-journals.

Research Objectives

The provision of electronic journals collections has required libraries and librarians to adapt and develop services and working practices (Ashcroft, 2002). The facility of e-journals, through INDEST Consortium has been in operation since 2004. The CL PEC has before it, proposals to expand the facility by adding more e-journals. It is, therefore, relevant and necessary to examine the use of this facility that has been in operation. Thus an attempt has been made to review the e-journal service and allied facilities offered to the user community in CL PEC. The research aims to highlight e-journal utilization and satisfaction levels of users and present the future proposals for improvement and expansion of the e-journal service. The main endeavor is to find out the trends in use of e-journals keeping in view the following objectives:

5. To appraise the overall usage of e-journals by the users of CL PEC.
6. To know the acquaintance of the users with the facility of e-journals existing at CL PEC.
7. To locate the preferred place for accessing the e-journals.
8. To determine the purpose and utilization of e-journals.
9. To ascertain the regularity of using e-journals.
10. To study comparative usage of print verses electronic journals.
11. To grade the various key advantages of electronic journals.
12. To highlight the hindrances and problems coming in online searching of information.
13. To study the satisfaction level of users for infrastructural facilities provided by the library for accessing e-journals.
14. To determine the preference level of using the journals in future.
15. To suggest suitable recommendations to improve the usage of e-journals for the betterment of users.

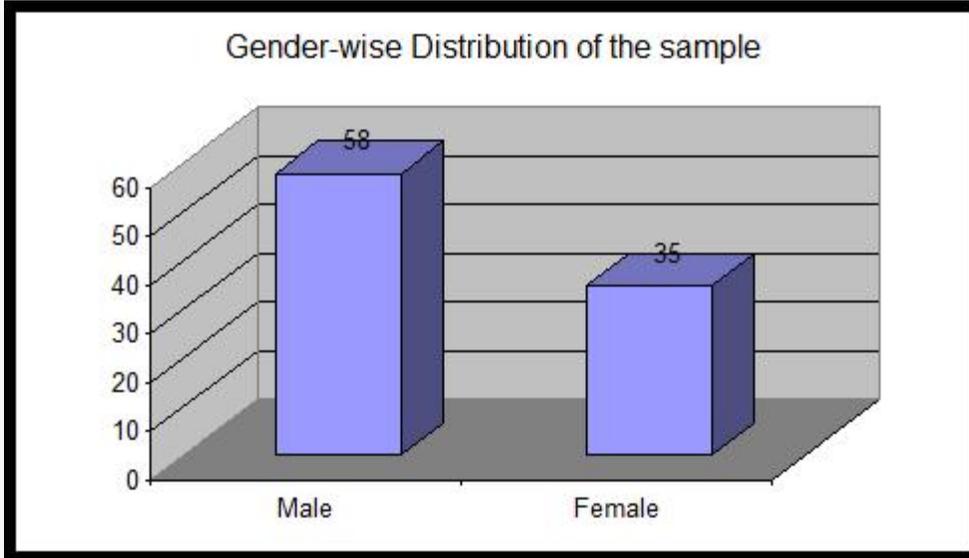
Data Analysis

The methodology was based on questionnaire method; a structured questionnaire was designed keeping in view the objectives of the study. Analysis on the basis of information provided by the respondent is done and inferences derived are as under:

User Demographics

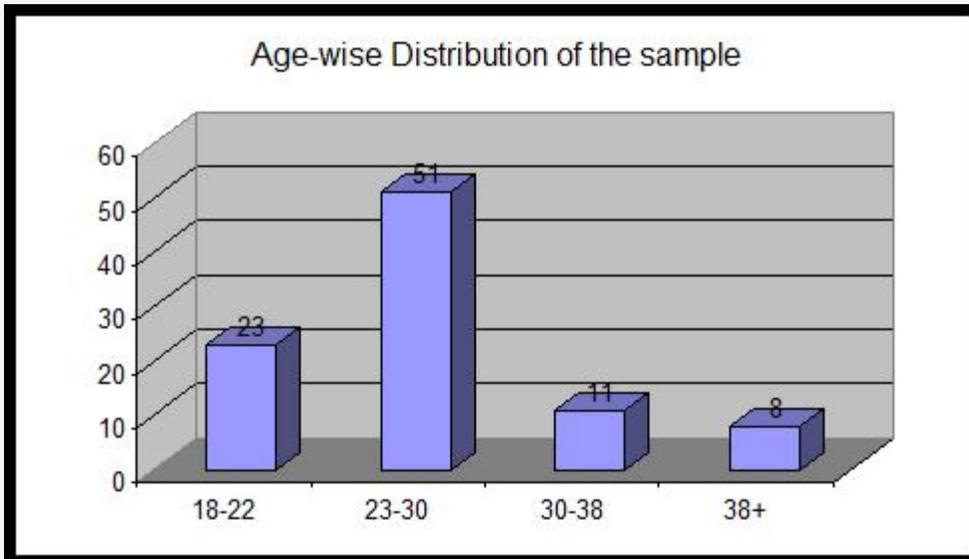
The study population comprised of both male and female users as indicated in fig. 1. Among the 93 respondents, male respondents were 58 (63%) and female were 35 (37%).

Fig. 1



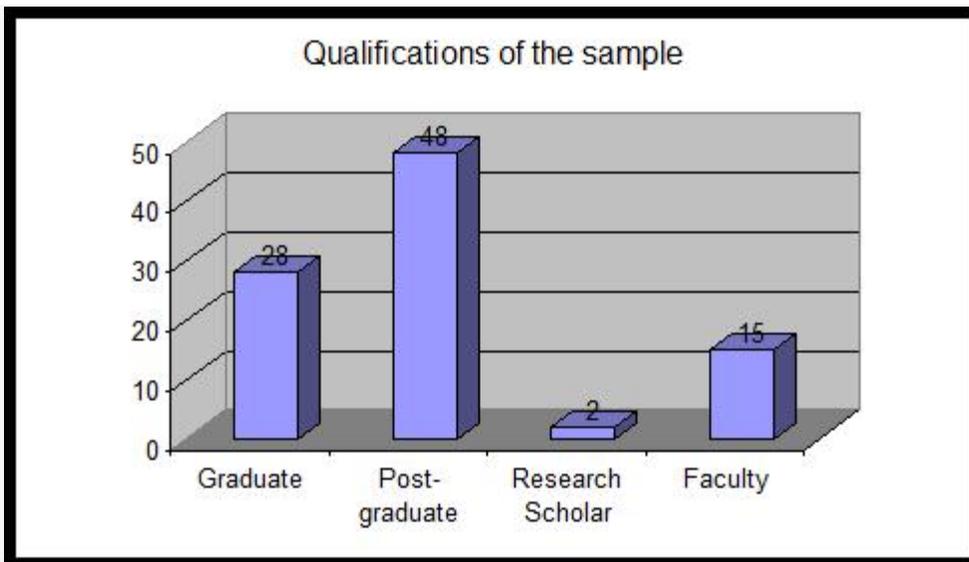
It is reflected in fig. 2 that majority of users were young, belonging to the age group of 23-30 years with their number as 51 (55%), followed by the age group of 18-22 years with number 23 (25%).

Fig. 2



By observing the fig. 3, it is apparent that more than half of the respondents 48(52%) were Post-graduate, 28(30%) were Graduate, 15(16%) were faculty and only 2 (2%) were Research Scholars.

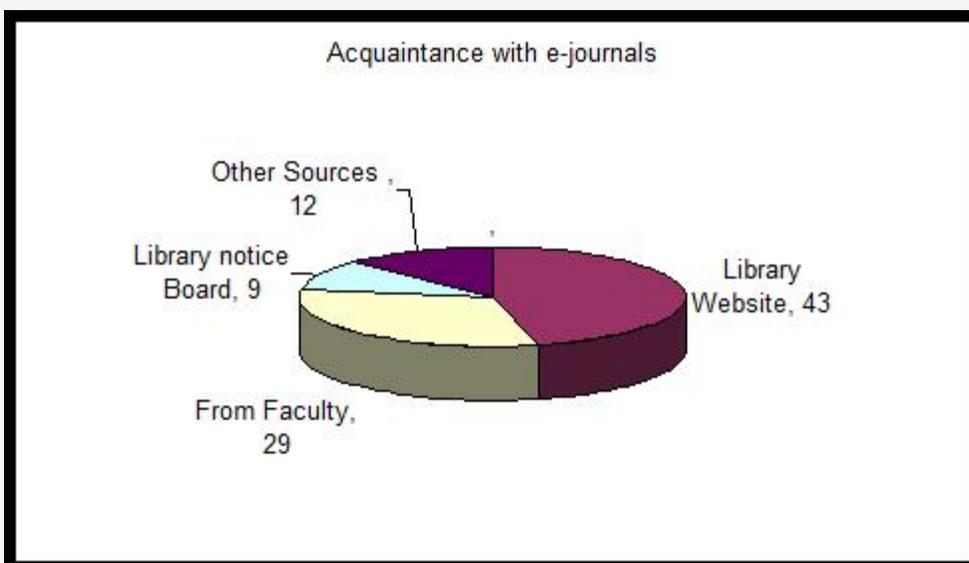
Fig. 3



Acquaintance with e-journals

Awareness about the e-journals is indispensable for updating the knowledge. The participants were asked whether they had been aware of the e-journal service available at CL PEC. 100% respondents were aware of facility of e-journals. But what was the main source of their knowledge? 43(46%) participants came to know about e-journals through library website and 29 (31%) from interaction with their faculty. 12(13%) participants responded 'other sources' like friends and searching the websites while 9(10%) find out about this facility from CL PEC Notice Board.

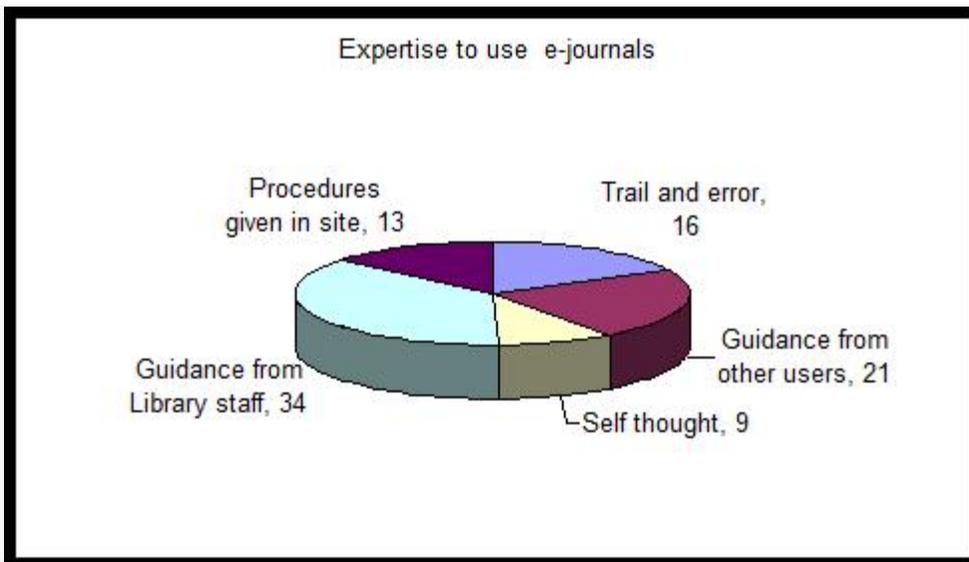
Fig. 4



Expertise to use e-journals

E-journals are published entirely electronically, for access via a web-browser, so, skills are necessary to access these. Fig. 5 indicates the most popular method of acquiring the necessary skills to use e-journals. It is summarized that 34(37%) respondents acquired necessary skills from guidance given by library staff and 21(22%) used the guidance given by other users. 16(17%) users were learned through Trial and error method whereas 13(14%) respondents were guided by the procedures given in the site itself and 9 (10%) users acquired this skill by Self thought.

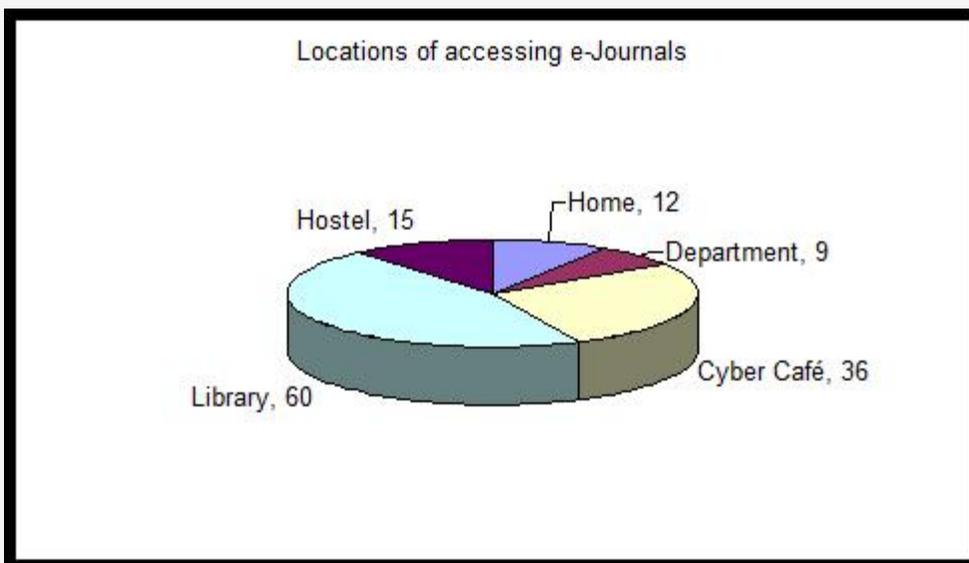
Fig. 5



Locations of accessing e-Journals

Certain areas in PEC have also been made WiFi-enabled to help students access the e-journals at locations other than the CL PEC. The motive is to have mobility and flexibility to accommodate all the users through WLAN. So, in PEC aspirants of e-journals can access them in the library or Cyber Café or Departments or Hostels as access to e-journals is provided through IP activation. The responses of users as to where they access e-journals are presented in fig. 6. It is evident that most of the users i.e. 60(65%) access e-journals in the library, 36(38%) access them from Cyber Café and 15(16%) users access e-journals from hostels. 12(13%) respondents access e-journals from home, whereas only 9(10%) users are there who use this facility from their respective departments. Because many users access e-journals from more than one location, the response rate is exceeded 100%.

Fig. 6

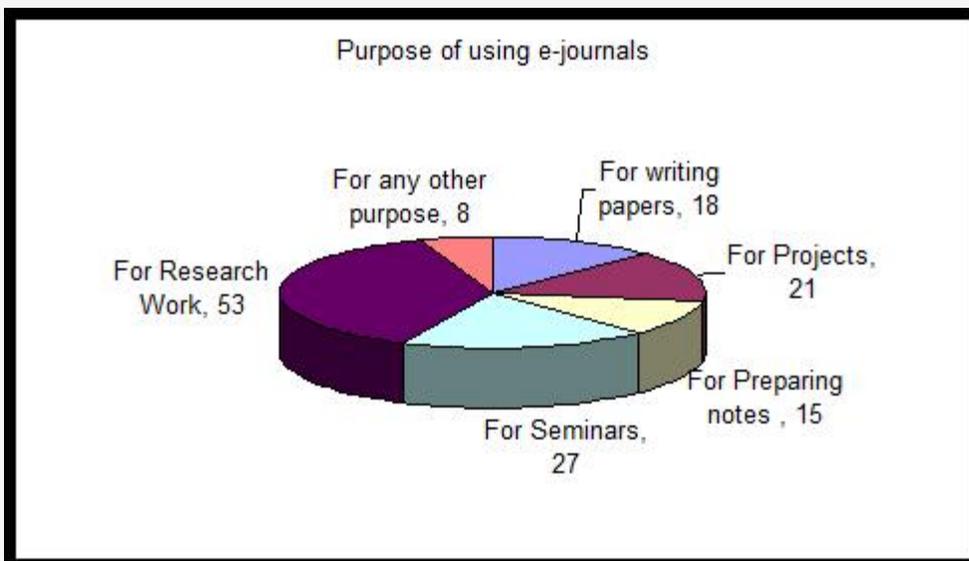


Purpose of using e-journals

E-journals now dominate the field of academic literature. This survey was also initiated to identify the purpose of using e-journals. Users' opinion given in fig. 7 reveals that for a good number of users i.e. 53(57%), the first and foremost purpose of using e-journals is research work, followed by use of e-journals for seminars by 27(29%) users and project work by 21(22%) users. 18(19%) users utilize e-journals for writing papers and 15(16%) make use of this facility for preparing notes. Only 8(9%) users

need facility of e-journals for other works like general awareness, etc. Here also because of multiple choices, the response is exceeded 100%.

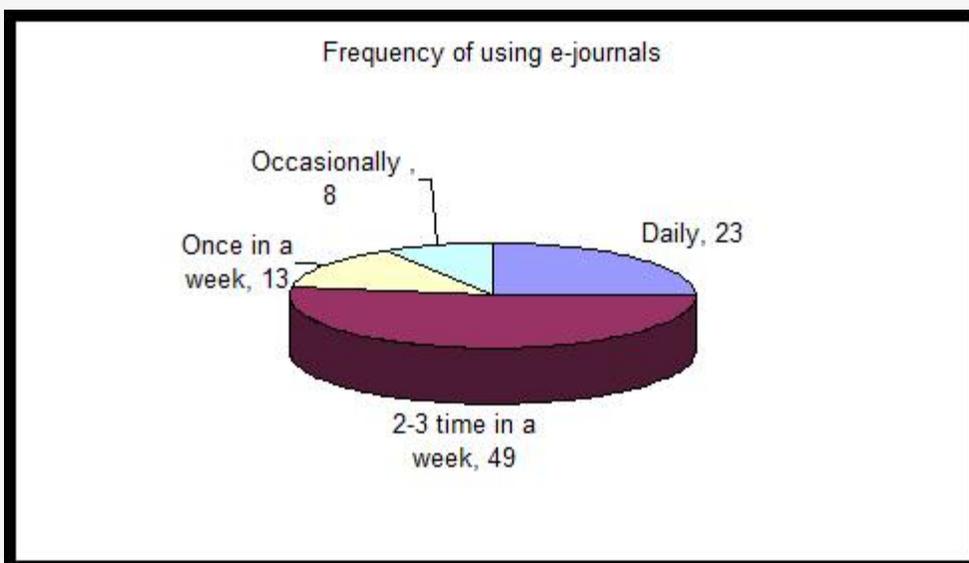
Fig. 7



Regularity of using e-journals

Regularity of using e-journals reveals their significance in the field of technology. In order to be in touch with the recent literature more than fifty percent 49(53%) users use e-journals 2-3 times a week. It is heartening to know that 23(25%) of respondents access e-journals daily. 13(14%) of respondents use e-journals once in a week and only 8(9%) use it occasionally.

Fig. 8

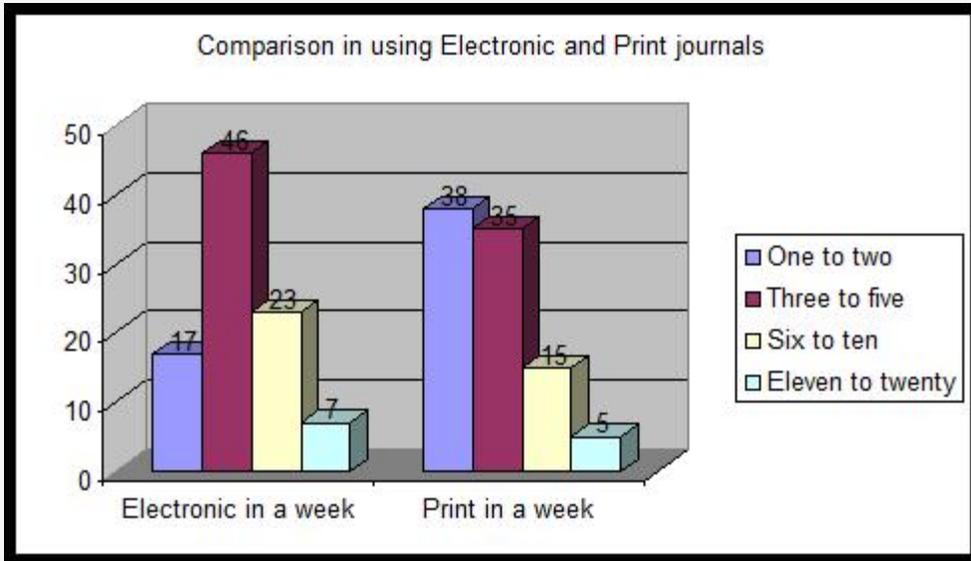


Comparison in using print and electronic journals in week

The journals will remain an important medium to recent information. CL PEC users prefer to scan e-journals more than their print counterparts. This trend is indicated in fig. 9. By observing the comparison given of using print and electronic journals in a week, it is seen in the figure that nearly half of the respondents 46(49%) read or use 3-5 e-journals whereas only 38(41%) consult 3-5 print journals in a week. 23(25%) users consult 6-10 e-journals in week, on the other hand only 15(16%) of users use 6-10 print journals in a week. Seventeen (18%) and thirty eight (41%) users read 1-2

electronic and print journals respectively in a week.

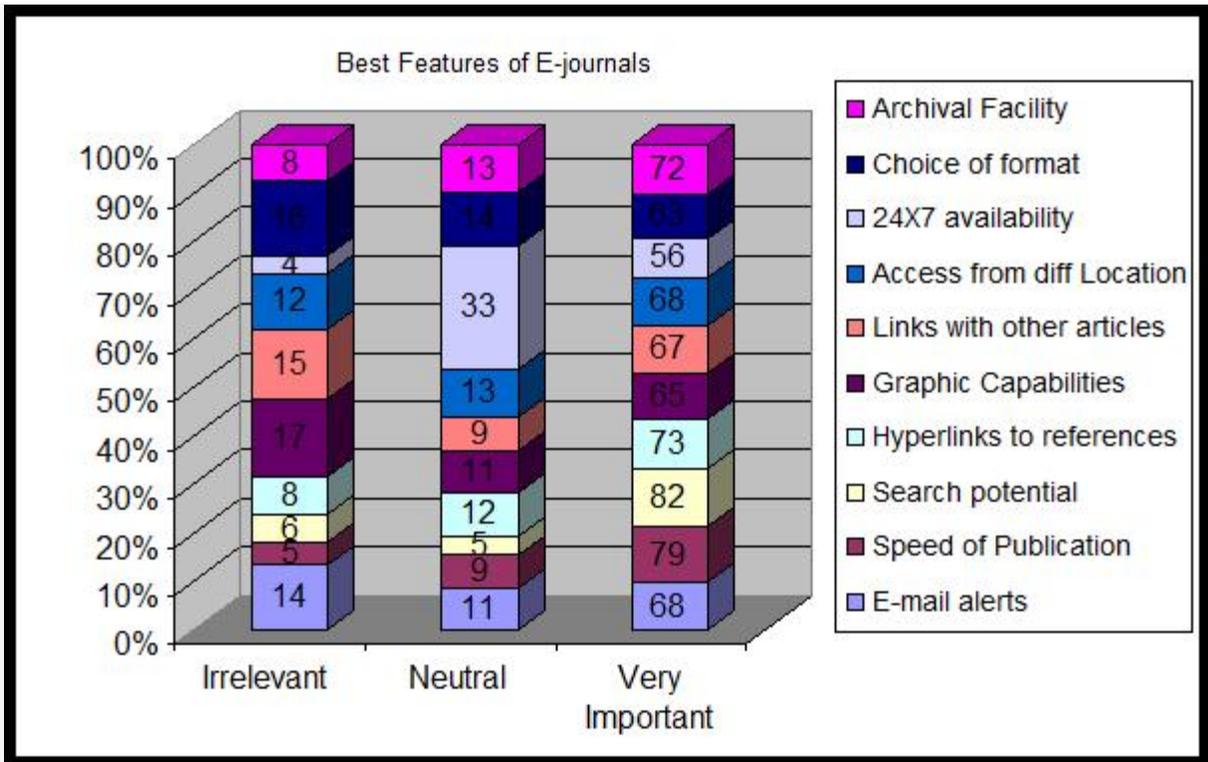
Fig. 9



Best Features of E-journals

E-journals have many potential advantage over their print counterparts like these provide timely access and at a 24x7x365 formula, supports different searching capabilities, accommodate unique features (e.g. Links to related items, reference linking), save physical storage space, can support multimedia information and have provision of e-mail alerts about latest issues (Sreekumar, 2005). Searching potential is the best feature for most participants liked by 82(88%) users followed by speed of publication opted by 79 (85%) users. Archival Facility and Hyperlinks to references are also chosen by many participants i.e. 73 (78%) and 72 (77%) respectively. E-mail Alerts, Graphic capabilities, Links with other articles and Archival facility are given almost same weight age. Choice of format i.e. HTML web page, or PDF format or Plain text format is also one of key advantage of e-journals. Surprisingly 33 (35%) user feel neutral towards the around the clock availability of e-journals. Some users also feel irrelevant to features like graphic capabilities and choice of format.

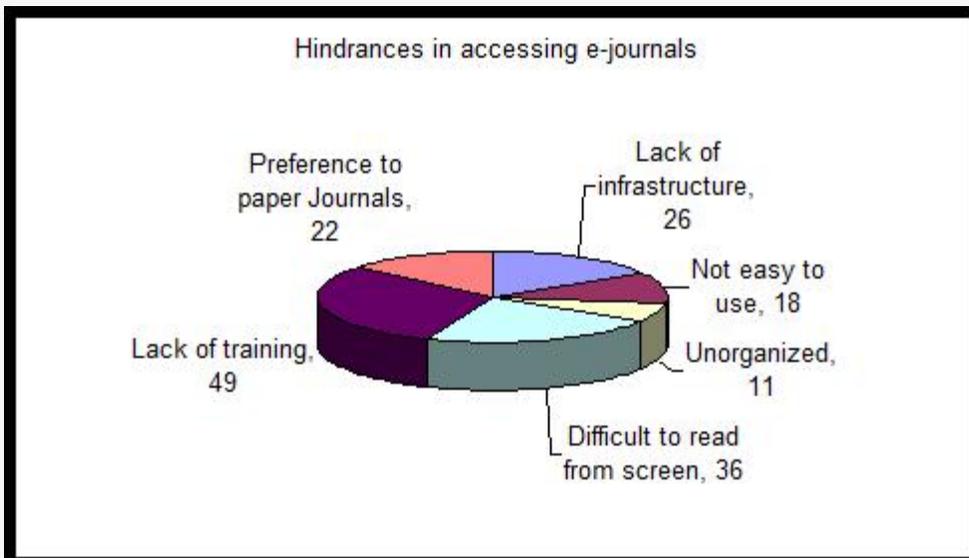
Fig. 10



Hindrances in accessing e-journals

E-journal usage is an important part of the scholarly communication and to share information with the broader scientific community. If libraries and information centres are to improve their scholarly and technological offerings, they must better understand the impediment of accessing e-journals. One imperative objective of this study was to enumerate the hindrances while accessing the e-journals. There are some troubles faced by users which deprive them to accomplish these important sources of information like lack of infrastructure, lack of training, difficult to read from screen, etc. Fig. 11 Below given chart identifies that 49(53%) users found lack of training as the major problem for not using or less usage of e-journals. 36(39%) users feel that it is difficult to read from the screen and 26(28%) users find lack of infrastructure is the main hindrance in using e-journals. 18(19%) users thought e-journals are not easy to use and 11(12%) are of opinion that e-journals as unorganized. As there is more than one barrier faced by a single user, the response rate is exceeding 100%.

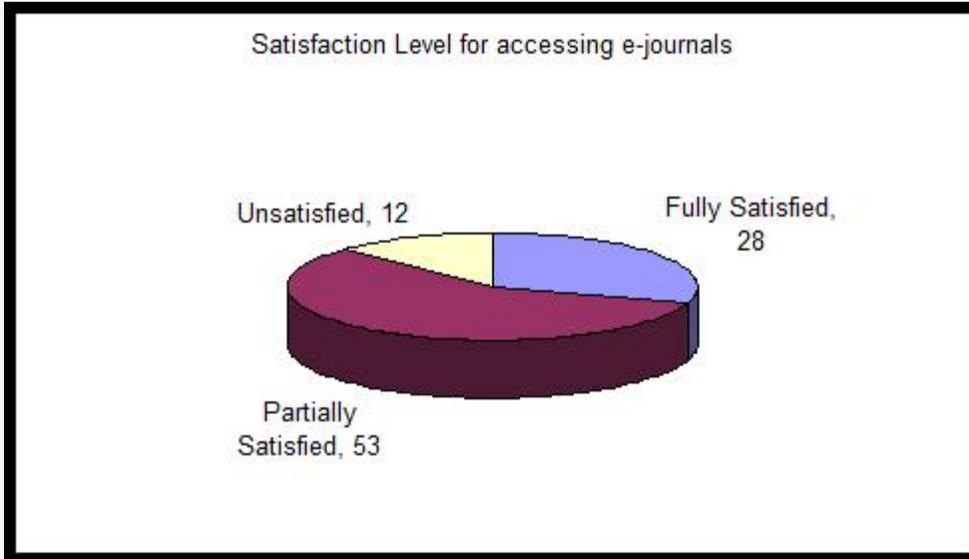
Fig. 11



Satisfaction Level for accessing e-journals

The purpose is to quantify the rate of satisfaction regarding the infrastructure being provided by the library for accessing e-journals, which in turn will facilitate to perk up the services. It is depicted that a large majority of users who are using this facility are partially satisfied 53(57%) or fully satisfied 28(30%) while only 12(13%) users are unsatisfied with the infrastructural facility provided by the library related to e-journals.

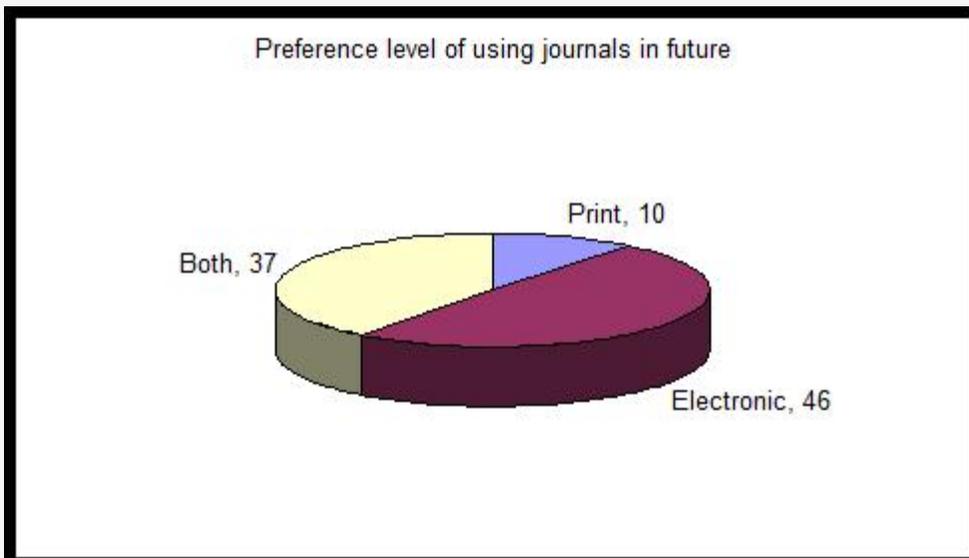
Fig. 12



Inclination towards using e-journals in future

It is believed that journals are and will continue to be primary tool in scholarly communications and prime source of contemporary information. Here an attempt to know the type of journals, users want to use in near future like only print or only electronic or they want to access both types of journals. The results are favoring e-journals as about fifty percent i.e. 46(49%) users want to access only electronic journals, only 10(11%) users want to read from print journals and 37(40%) users want to access from both print as well as electronic form of journals.

Fig. 13



Major Findings

Present study serves as a useful snapshot in recognizing user acceptance of e-journals while simultaneously highlighting the advantages and the problems encountered while accessing them. The major findings of the study are summarized below:

1. Going through the responses of the users obtained through the questionnaire, the fact is established that e-journals are proving to be highly useful service in the world of technical information and frequency of usage of e-journals is increasing day by day.
2. Majority of users of e-journals are young, belonging to the age group of 23-30 years (55%).
3. 52% users belonged to Post-graduate level amongst the total sample of 93.
4. 100% users were aware of the facility of e-journals and majority of users (46%) gain knowledge about e-journals from the library web page.
5. As far as learning how to access the e-journals, users were not depending on any particular means. Majority of them (37%) acquired skills from formal training given by library staff and 22% used the guidance given by other users.
6. For a significant proportion of the users (65%), library is a favorite place to access e-journals.
7. The users were aware that e-journals could be utilized for various purposes like for research work, seminars, project work and writing papers etc, but primarily it is being used for research purpose (57%).
8. The users who access the e-journals daily are considerably less (25%) and users using e-journals 2-3 times a week is 53%.
9. Easy search (88%) and Speed of publication (85%) are the key advantages, as revealed in study.
10. The problem areas in which the respondents face considerable troubles include lack of training (53%) and difficult to read from screen (39%).
11. From the analysis it is apparent that a significant segment of users (57%) are fully satisfied with the facilities provided by the CL PEC in accessing e-journals.
12. Results of study also reveal that a good number of users (49%) want to access journals in electronic form in future.

Discussion and Recommendations

E-journals are now accepted means of information source and academic libraries are making great efforts to procure them and enhance the value of their collections. Present study reveals the trends in usage of e-journals in terms of awareness, necessary skills and availability of infrastructure for their effective utilization, with a few constraints reported by the user. Present scenario is watching a shift towards e-journals though the pace is quite slow. The slow pace of usage of e-journals is because of some hindrances faced by users while accessing them. The users are gradually getting used to journals which are available in electronic format. Major advantages reported are searching potential, speed of publication, Hyperlinks to references, e-mail alerts, graphic capabilities, and access to back volumes. Major challenges reported are lack of both awareness and proper training among the library users and lack of proper infrastructure for accessing e-journals. Although libraries are trying hard to meet the challenges posed by the e-journals but it will be difficult to overcome every barrier in a short time yet the researcher put forth some suggestions on the basis of above findings that should be given serious consideration to enhance the use of information available in electronic form.

1. The first and foremost necessity is to create awareness among users about the advantages and potentials of e-journals. This will encourage more and more users to explore the prospective of e-journals. For this purpose library has to market properly their e-journal services. The help of faculty could be taken so as to engage them for spreading the awareness about the e-journals. Posting updates on the Library's web pages is an additional way to enhance awareness as it is crystal clear from the survey that majority of users become aware of such facilities through library's web pages only.

2. As lack of training is major hindrance reported in using e-journals, PEC library must educate its user community for fully exploiting the e-journals. In order to improve the efficiency of the users for accessing e-journals, the institute should provide hands on experience, short term courses or workshops and conduct user orientation programmes. There is an urgent requirement to provide systematic orientation to use e-journals in order to overcome the difficulties faced by the user community. This will help users to know various developments and searching techniques for accessing the desired information from the web.
3. As majority of users acquired necessary skills to access e-journals from formal training given by library staff, libraries must employ more trained and skilled staff, that are well versed with the functioning of both software and hardware and can facilitate the users in areas like accessing, downloading, and printing of e-journals. Also there must be stipulation for on-job training for the present library staff to acquaint them with latest technologies so that they can help the users in searching the potentials of the e-journals to the full.
4. When users begin to depend on e-journals, they often don't bother to try print journal stacks. So it is especially important for libraries to provide a wide variety of online journals, since most users will select the electronic versions, even if a particular title or article is not best for their needs.
5. Use statistics are a vital part of evaluating the usefulness of any product. There should be a continuous feedback mechanism in the form of user surveys to know the responses of the users, so that further action can be planned accordingly.
6. Month-wise usage reports for e-journals can serve as useful tool to measure utility of a particular e-journal and can enable the library to plan their promotional activities or subscription schedule.

Conclusion

Since its establishment, CL PEC is rendering library services to its users resourcefully. The findings derived from the study are based on a sample of 93 users. So although the finding cannot be generalized but these provide significant insight into the latest trends being followed in sphere of e-journals. The use of e-journals is an evolving phenomenon at this stage as e-journals are slowly replacing the print versions of scholarly publications. The survey clearly indicates that use of e-journals in the CL PEC is still in the state of infancy or early maturation. It is also indicated in the survey that this state of infancy is because of lack of marketing strategies to make all the users aware of full range of e-journals available. It is clear from the study that younger generation has conveniently adopted the electronic reading culture, but use of e-journals requires some sort of technical expertise. Lack of training among users is major de-motivating factors in the use of e-journals and some important suggestions for improving the utilization of e-journals has been put forth. Also use of e-journal is very limited because of infrastructural problems.

Trends seem that users are gradually getting used to e-journals and libraries stand at a brink of digital information horizon. The only way to keep pace with the bursting of information in all directions is being proactive in form of e-journals, an extensive source of bundled knowledge. So if CL PEC is to go beyond the services of a traditional library and to provide a sound electronic information platform, it is left with little option but to accommodate more and more e-journals.

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