Full Length Research Paper

Use of Open Access Resources by the Engineering Students of Punjab (India)

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This study presents the results of a survey that assessed engineering student's familiarity with use of open access resources in Punjab (India). The survey was made through questionnaires and completed by 460 respondents. Respondents were generally familiar with open access sources including open access journals, institutional repositories and self-archived materials on the web. Respondents' attitudes toward open access varied, but most agreed that open access resources are of high quality and that open access would benefit them. In helping researchers find open access information, more respondents had used open access journals than institutional repositories or self-archived materials. Some of the challenges faced by the student fraternity in accessing these resources have been enlisted and appropriate recommendations have also been given.

Key words: Open access, resources, online e-resources.

INTRODUCTION

Much attention has been focused on the rising costs of journals in academic libraries as academic serials subscription prices increase. University libraries often cannot afford to purchase subscriptions to renowned journals and these can even force libraries to cancel existing subscriptions. Bailey (2005), the increasing price of scholarly information, combined with new technologies that permit widespread access to electronic information, has led to an effort to allow researchers to access scholarly information online for free. Many researchers have examined authors' attitudes toward these new open access sources. Thomas (2006), studies have examined whether authors choose to publish in open access sources and what attitudes they have about those sources. These studies have led researchers to the conclusion that many authors are unaware of their open access publishing options. Many authors do not publish in open access journals and institutional repositories because they do not know about those options. Venkadesan (2009), many authors have misconceptions about the characteristics of open access sources, and

those misconceptions prevent them from venturing outside the traditional model. Other researchers move on from those findings to propose that author education will raise awareness of and eliminate many of the common misconceptions about open access sources. Swan (2005), to the extent that authors do not publish in open access journals or deposit work in institutional repositories because they do not know those options exist, education would increase the amount of work submitted to open access publishing sources.

What is open access?

Nicholas et al. (2005), open access focuses on three main characteristics: it is available on the internet, there are no financial or legal barriers to accessing it, and authors use copyright only to maintain the integrity of their work and retain the right of attribution. Park and Jian (2007), the Budapest Open Access Initiative describes two methods of achieving open access: self-archiving and open access journals. Self-archiving includes both institutional repositories (IRs) and personal web archives. Self-archived materials may also be stored in a departmental or discipline-specific online repository. Some self-archived materials (for example, working

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papers) may restrict viewers to a certain group (for example, colleagues in a department), while others are freely available on the web. Open access journals are scholarly journals that are freely available online. Many are peer reviewed, but some are not. Some are online-only publications, while others are duplicates of print journals. Willinsky (2003), the "delayed open access" model provides complete free access after an embargo period, often six months after the initial publication for subscribers. Another variation is "partial open access," which means that only a portion of the subscription-based journal is available for free online.

Objectives

This study seeks to address the following research question to particular strata of students belonging to technological background:

"What is the engineering student's attitude towards use of open access resources?"

The results of this survey shall also apply to other group of students having similar interests and background. Academic researchers can be profoundly impacted by the increasing amount of information available through open access journals because an increase in the amount of open access literature increases the scholarly material that is available to all academic researchers. Because open access journals are relatively new, many authors are not familiar with them.

Scope

The scope of this study is limited to a particular area in India having fairly good standards of education and the students having technological backgrounds that is students of engineering and technology.

Limitations

The limitation in this research concerns the extent of generalizability of the results in this research. The current sample size just about meets the requirements for the stepwise multiple regression. The results of this survey are limited by the sampling method that was used. Because survey participants were recruited using mailing lists, it is not possible to determine the response rate or to determine whether subjects in certain groups were more or less likely to complete the survey. Because the survey was identified as being about open access resources, it is likely that respondents who knew about or were interested in open access were more likely to decide to participate in the study. This may have led to a population of respondents that is more aware of and interested in open access than the general. The issue of

social desirability limits this study's validity. In general, people are reluctant to seem ignorant in their responses to survey questions. It is certainly plausible that other perspectives may be used to understand the use of Open Access Resources by a specific group of people.

About the survey

The survey was conducted in Lovely Professional University (Jalandhar), DAV Institute of Engineering and Technology (Jalandhar), Thapar University (Patiala), Rayat and Bahra College of Engineering and Technology (Ropar), Adesh Institute of Engineering and Technology (Faridkot), Punjab Agriculture University (Ludhiana) and Guru Nanak Dev Engineering College (Ludhiana). There are more than 100 Engineering Colleges in Punjab and 5 Universities but couldn't cover all of them in this survey. 460 respondents completed the survey. 26% described their institution as University, 74% described their institution as a college. 63% students were male and 37% female. 15% of the students were enrolled in Civil Engineering, 21% in Electronics Engineering, 18% in Mechanical Engineering, 32% in CSE and IT, 2 % in Agricultural Engineering and 12% in Electrical Engineering.

METHODOLOGY

Questionnaires were used to evaluate Engineering and Technology student's familiarity with, attitudes toward, and use of open access resources. The Questionnaire specified that the survey is for engineering students and included a brief description of the survey and estimates that it will take approximately 15 minutes to complete. The information sheet followed a question and answer format to provide participants with information about research studies in general and this study in particular. The first section of the survey asked participants about their academic environment, and the second section addressed participants' attitudes toward open access publishing in general. The last section of the survey assessed participants' professional use of open access resources, including open access journals, institutional repositories, and self-archived materials on personal websites. One question in the survey identified whether the respondent considers herself to be knowledgeable about open access sources. Another set of questions used a Likert-type scale to ask the respondent to what degree he or she associates each of a set of 20 characteristics with open access.

Familiarity with open access resources

Respondents were asked about the extent to which they agreed with a number of statements about open access. Some statements related to characteristics of open access resources, while other statements related to what open access publishing will lead to in the future. 67% of respondents either agreed a little or strongly agreed with the statement that open access are cutting edge. 80% of respondents disagreed with the statement that open access is a fad; only 7% reported believing that open

Table 1. Do you think open access is.

Variable	Strongly disagree (1)	Disagree a little (2)	Neither agree nor disagree (3)	Agree a little (4)	Strongly agree (5)	Mean	Standard deviation
Radical	55	158	109	107	31	2.75	1.25
High quality	3	30	177	158	92	3.65	0.88
Cutting edge	3	45	108	202	102	3.78	0.91
A fad	240	141	62	27	4	1.76	0.94
Electronic only	35	80	97	150	98	3.47	1.23
Well indexed	62	142	190	68	11	2.63	0.96
Archived properly	32	141	222	67	9	2.75	0.85
Expensive for researchers	132	156	127	50	9	2.26	1.04
Expensive for authors	92	142	132	94	14	2.57	1.1
Beneficial to authors' careers	10	46	117	186	115	3.74	1

access is a fad. There was little agreement regarding whether open access would lead to the disappearance of print journals 14% strongly disagreed, 25% disagreed a little, 18% neither agreed nor disagreed, 34% agreed a little, and 9% strongly agreed that print journals would eventually disappear. The mean response was 2.99 (Neither agrees nor disagrees) and the standard deviation was 1.23. These responses indicate that, in general, academic reference librarians believe that open access resources will not lead to a decrease in the quality of scholarly publishing. These results are depicted in Table 1. 64% respondents indicated that they believe open access is beneficial to authors' careers. The responses were fairly evenly distributed regarding whether open access would lead to libraries' having more money to spend: 18% strongly disagreed, 26% disagreed a little, 21% neither agreed nor disagreed, 27% agreed a little, and 8% strongly agreed. The mean response was 2.8 (between slightly disagree and neither agree nor disagree), and the standard deviation was 1.23. 31% of respondents disagreed, 15% neither agreed nor disagreed, and 53% of authors agreed with the statement that open access publishing would lead to the end of print journals. While only 35% of respondents surveyed either agreed a little or strongly agreed with the statement that open access would lead to libraries' having more money to spend.

A little more than a third of respondents 37% disagreed with the statement that open access is properly archived, and almost half (43%) disagreed with the statement that open access is well indexed. Despite these concerns, 40% agreed a little and 37% strongly agreed that open access will lead to easier accessibility of research papers. The mean response was 4.01 (Agree a little), and the standard deviation was 1.02. These results are depicted in Table 2.

Use of open access resources

Almost two-third of the respondents noted that they know about opportunities and limitations of using open access resources as has been depicted in Figure 1. Many respondents noted that they considered open access resources alongside paid resources, while others highlighted research needs that are uniquely met by open access resources. Others mentioned that because some professors require that students cite only traditional paid resources, they do not use open access resources. Use of those resources seems to vary across institutions: One respondent noted that his or her "college keeps students' theses in our institutional repository. Lots of other students use these," while another reported that his or her "institution's dissertations are in a repository and rarely requested." In general, respondents reported using institutional repositories for specific research needs, such as finding a dissertation or work by a specific author or institution. Figure 2 depicts the familiarity of the students with Open Access Journals and the comparative analysis with Institutional Repositories and Scholarly work posted on the personal websites. 92% of students agreed that they are familiar with open access journals and read them regularly for exams, only 8% replied in negative. 85% of the students were familiar with Institutional repositories and only 15% replied in negative. Also 82% of the students had read the scholarly work posted on the personal website and only 18% replied in negative.

Open access materials on the Web also meet special research needs. Several respondents reported using the Web in addition to paid resources to find information about specialized topics. Others reported that open access materials on the Web are useful when researchers need immediate access to research. One respondent reported that "when a professor has needed an article immediately, I have searched for the author's website and found the article," saving the time it would take to process an interlibrary loan request. One respondent reported that he or she has "explained how working papers can be a valuable resource for current research to faculty." Another has demonstrated to researchers that "RSS is useful for following the work of a

Table 2. Do you think open access will lead to.

| Variable	Strongly disagree (1)	Disagree a little (2)	Neither agree nor disagree (3)	Agree a little (4)	Strongly agree (5)	Mean	Standard deviation
Authors will publish more	6	56	142	191	69	3.56	0.93
Authors will have less choice over where they publish	122	194	95	49	4	2.18	0.97
The quality of papers will improve	16	103	279	55	12	2.88	0.75
Fewer papers will be rejected	22	94	156	165	23	3.16	0.97
Publishers will improve their services to authors	19	92	134	191	34	3.29	0.98
Publishers will improve their services to subscribers	23	76	119	184	58	3.39	1.06
Papers will become less concise	54	171	178	54	7	2.55	0.9
Libraries will have more money to spend	83	123	97	125	35	2.8	1.23
Print journals will gradually disappear	64	118	82	157	4	2.99	1.23
It will be easier to access papers	9	44	52	187	170	4.01	1.02
Archiving will suffer	47	119	172	102	20	2.84	1.02
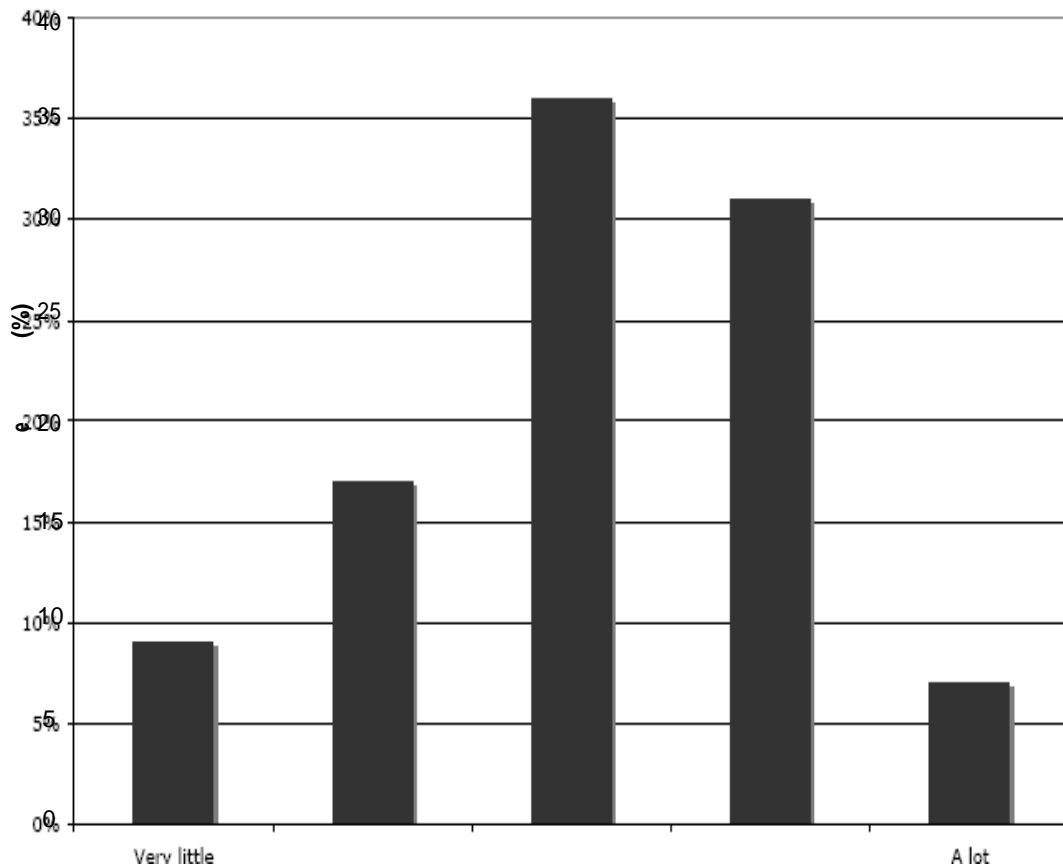
Figure 1. How much do you know about open access publishing (including open access journals, institutional and self-archiving on personal websites)?
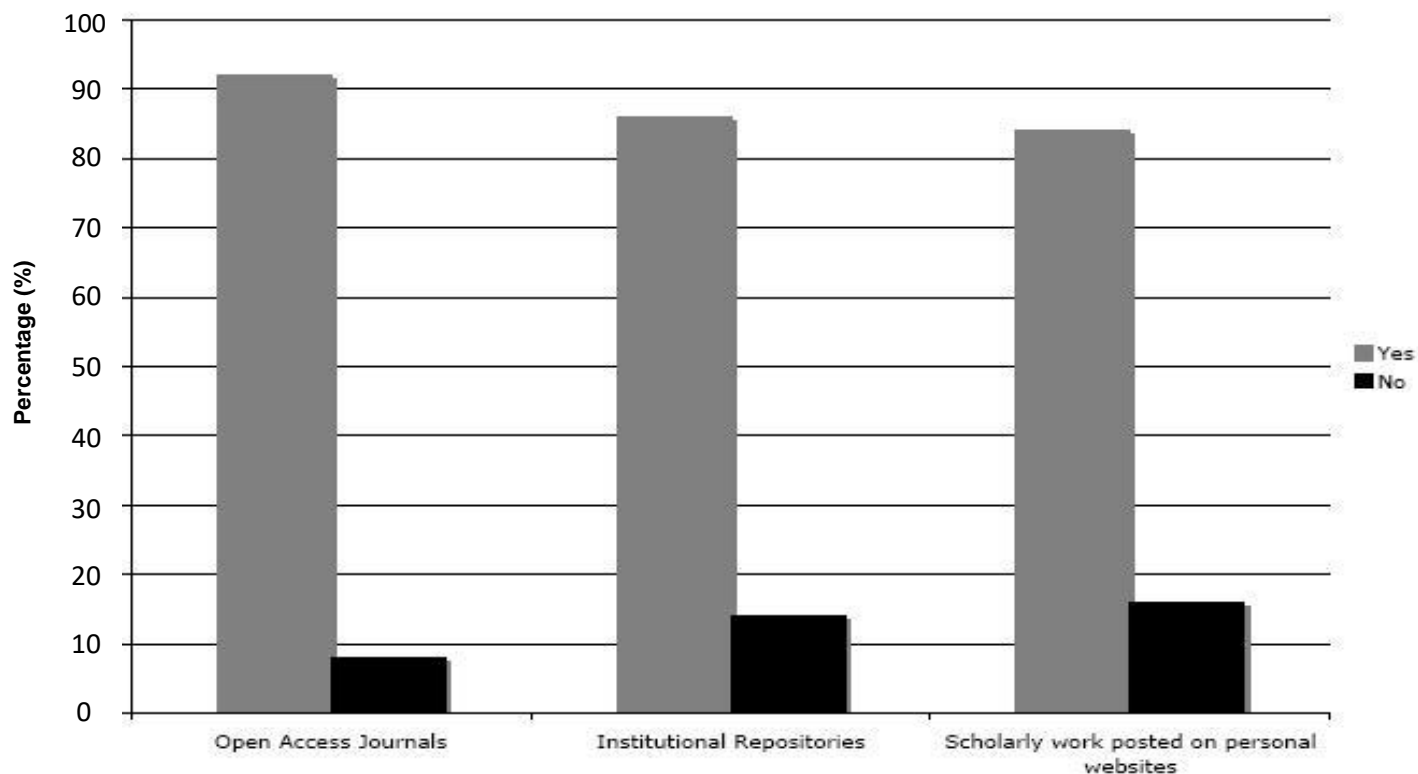
4

Figure 2. Are you familiar with open access journals, institutional repositories and scholarly work posted on personal websites?

researcher who is doing similar work." Open access resources on the Web can also increase researchers' to borrowing material from other libraries. Several respondents mentioned that they routinely check institutional repositories (IR) before completing interlibrary loan requests. Many respondents reported that whether a resource is open access is a secondary concern. Several respondents emphasized that while they are comfortable using peer reviewed or other high quality open access resources, they do not actively seek out those resources. This approach highlights the importance of integrating high quality open access resources with traditional paid resources. Foster and Gibbons (2005), it is more important to use the highest-quality, most relevant research for the topics, and in most cases; unfortunately, this excludes repositories of open access content.

Conclusion

The open access movement has created a new body of scholarly literature that is available to users for free. Johnson (2005), open access journals are available on the open web, and institutional repositories allow authors to self archive their work in a stable online environment. While the future of this model and the exact ways it will

awareness of what is going on at their own institution. Institutional repositories are also useful as an alternative affect the existing publishing model are uncertain, it is clear that new resources are now available to authors who want to publish their work. The results of this study indicate the need for increased awareness that open access are valuable and qualitative source of information. 34% of respondents reported knowing nothing about open access resources, and half of the respondents who knew about open access described themselves as knowing only a little. However, most survey respondents' familiarity with open access journals, institutional repositories, and self-archived materials on the web indicate that engineering students may be well suited to take on the instructional role. Respondents' generally positive attitudes toward open access indicate that many students support open access materials and might therefore be more likely to encourage others to publish in them. 78% of respondents surveyed also indicated that open access would lead to easier accessibility of papers. Many survey respondents cited the support or lack of support from their institution as a contributing factor in their professional use of open access resources, especially regarding teachers encouraging authenticating such resources. Research about institutional support of open access publishing might shed more light on the question of what factors influence engineering student's

5

professional use of open access resources. Further research in this area could explore the ways in which institutions can encourage the teachers to take on the role of teaching students about open access publishing opportunities.

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