
USE OF OPEN ACCESS JOURNALS BY FACULTY / RESEARCH SCHOLARS' OF ENGINEERING COLLEGES IN MYSORE CITY

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Abstract

The present work introduces a statistical evaluation method to prove the hypothesis being formulated in this paper. Although the previous work of ours has discussed and proved that open access journals are highly beneficial for academicians as well as researchers in multiple purposes. However, there are various facts which can surface and not addressed in our previous work. Some facts like i) fear of loss of revenue when the manuscript are publically accessed, ii) does open access document usage gives an alternative solution for IT infrastructure which is highly expensive in nature, and ii) does usage of open access journals mitigates the clerical issues. Hence, in the current paper, we choose to consider the same population and universe that has been a part of our prior study and we choose to perform some of the statistical analysis to check how far the hypothesis are proven correct or wrong.

KEYWORDS :

Open Access Journals, Electronic Resources, Open Access, Impact Factor

1.1 INTRODUCTION:

Open-access journals are scholarly journals that are available online to the reader "without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself." Some are subsidized, and some require payment on behalf of the author. Subsidized journals are financed by an academic institution, learned society or a government information center; those requiring payment are typically financed by money made available to researchers for the purpose from a public or private funding agency, as part of a research grant.

There have also been several modifications of open-access journals that have considerably different natures: hybrid open access journals and delayed open access journals. Open-access journals (sometimes called "the gold road to open access") are one of the two general methods for providing open access. The other one (sometimes called the "green road") is self-archiving in a repository. The publisher of an open-access journal is known as an "open-access publisher", and the process, open-access publishing". Moreover, open access models are beneficial in a number of ways (Antelman, 2004; Nicholas & Rowlands, 2005):

Research is available at no cost, and with no access restrictions, for readers around the globe; scholars in economically disadvantaged areas are no longer barred access to the newest research.

Because research published via avenues of open access is openly accessible online, it is more easily discoverable both by scholars and by search engines.

For scholars in science and technology, where subject matter may be especially time sensitive, publication in open access journals occurs much more rapidly, and not necessarily with any impact on quality control.

Since research is available globally without access restrictions, scholars benefit from having a significantly larger, more diverse audience.

Increased exposure to research will also lead to more numerous citations.

These benefits are judged to be more or less uncontroversial, unlike the issue of cost which will be discussed more fully in a later section on the economic impact of open access. Let it suffice to say that open access is an issue worth investigation by academic libraries given the general trend of shrinking library budgets and growing journal prices, especially within the scientific, technical, and medical (STM) disciplines (Rovner, 2005; Crawford, 2005). In a number of articles on the subject of open access, in fact, the phrase "serials crisis" is bandied about, leading one to believe that there is at least some kernel of truth to the notion.

1.2 REVIEW OF LITERATURE

Pinfield (2007) have demonstrated that a paper takes a critical look at that assumption. It draws on the available evidence of actual practice which indicates that coexistence is possible at least in the medium term. It discusses possible future models of publication and dissemination which include open access, repositories, peer review and journals.

Pence and Losoff (2011) have presented despite the best efforts of textbook authors to provide information about recent research results, textbooks are not a substitute for learning to use the primary literature.

Crewe (2005) has proposed a report on the progress of an extension to a journal publishing system (OJS) to add RDF aggregation. The system is a lightweight open source repository solution with full CMS features for devolved publishing, a new semantic module is in development for enhanced navigation, searching and for content re-purposing. African Journals Online is used as the example live installation of the extended OJS.

Astrom (2008) have illustrated the differences between research fields are simply too substantial to make any claims on a more general level. The subject categories used in the analyses are those of Thomson Reuters' Journal Citation Reports, a subject classification that is not entirely unproblematic.

Clarke and Kingsley (2009) have presented the OA credentials of journals against an operational definition of the requirements, and found that the terms of copyright licensees are currently relatively liberal. The expectations of openness stimulated by widespread availability of the Internet, reinforced by the ePrints, OA and repositories movements, have to a considerable extent succeeded in creating the appropriate legal context for open access and unlocked IP.

Zainab (2010) have describes the growth of Open Access (OA) repositories and journals as reported by monitoring initiatives such as ROAR (Registry of Open Access Repositories), Open DOAR (Open Directory of Open Access Repositories), DOAJ (Directory of Open Access Journals), Directory of Web Ranking of World Repositories by the Cyber metrics Laboratory in Spain and published literature..

Ouya and Smart. (2006) have presented their survey revealed an incomplete/inaccurate understanding of OA, and fears about sustainability; clarity on OA might be a prerequisite to the publishers' embracing the online publishing model.

Ivwithreghweta. (2012) have proposed an ongoing debate as to whether the proliferation of open access (OA) publishing would damage the peer review system and put the quality of scientific journal publishing at risk.

McCullough (2009) have illustrated an OA journals are often perceived, rightly or wrongly, as having a second-class status compared to traditional journals. Whether OA journals are serious about competing with traditional journals can be determined by the extent to which they adopt mandatory data code archives. Given the literature on first-movers, OA journals cannot wait. Traditional journals have a

head start, and if the OA journals delay the adoption of mandatory data code archives, they may never be able to eliminate the second-class perception.

1.3 RESEARCH METHODOLOGY

The assignment of data collection and processing ran from June 2013 to October 2013. Field research was carried out in Mysore, Southern part of India over a period of five months. The mixed research strategy is adopted where both qualitative and quantitative techniques were considered aimed at producing in-depth knowledge about the topics of significance and utility of open access journal being investigated. The research survey parameters are as shown in Table 1
Table 1 Research Survey Parameters

Research Methodology	Qualitative and Quantitative	
Total participants	-430	
Participant Sampling	-263 Male participants	-167 Female participants
Universe	Mysore (Karnataka, India)	
Tools Used	T-test, F-test, Statistical Analysis with SPSS.	
Questionnaire Design	-32 semi-structure questions (Refer Appendix-1)	
Questionnaire Sampling	-32 questions includes: -Research Viewpoint -Educational Viewpoint -Institutional Viewpoint	

The research methodology to be conducted will be both qualitative as well as quantitative. The procedures for performing the proposed study in qualitative and quantitative manner are described as follows:

Procedure to perform Qualitative study: For this purpose, the data will be obtained from participants in the location of Mysore, Karnataka, India. The study gives equal priority to both male and female participants, although known the impartial opinion of senior experienced professional participants are mostly sought. All the respondents are targeted to capture their impartial thoughts and outlook for the open access journal as well as their personal opinion. For this purpose, a set of questionnaire will be designed.

Procedure to perform Quantitative study: As the proposed study include large number of participants, hence quantitative study will be highly required. Moreover, as the proposed system considers 3 hypotheses, hence evaluation of the hypothesis can be robustly done using quantitative analysis. Data analysis using SPSS results will follow next when a description of the results arrives—also referred to as the “essential description”—had been finished and reviewed by the participants (pending minor changes). The steps in the data analysis were: (1) transcription; (2) horizontalization of meanings; (3) clustering of meanings; (4) textural description; (5) structural description; (6) essential description; and (7) validation of the essential description. Interview schedule to be administrated on male and female participants will be expected to furnish the perception of topic.

1.4 RESEARCH DESIGN

The prime aim of the study is to get an in-depth and real-time analysis of effectiveness of OAJ for

evaluating its respective contribution in usage and technical competence upgradation among the faculty members. For this purpose, Karnataka is selected for the purpose of conducting the investigation. Majority of the higher technical institutes are operated under the jurisdiction of the Universities in the state viz. Bangalore University, Kuvempu University, Mysore University, Mangalore University, Gulbarga University and Karnataka University. The preliminary target of the study was to identify the Engineering Colleges having research center in Karnataka and then to list out the research scholars in the Engineering Colleges and gather information about usage of OAJ. A standard questionnaire is designed where information is collected through Email, Blogging and Online Forums. Six engineering colleges will be selected randomly from the universe.

Maharaja Institute of Technology
Academy for Technical And Management Excellence College of Engineering
NIE Institute of Technology,
Vidyavardhaka College of Engineering
GSSS Institute of Engineering & Technology for Women
Sri Jayachamarajendra College of Engineering

The colleges were selected based on the fact that there is higher extent of research foundation and superior innovative educational policies followed in these colleges. The participants considered for the study is selected from these colleges and proposed study considers a sample size of 430.

1.5 STATISTICAL ANALYSIS FOR HYPOTHESIS-1

Hypothesis-1 claims that “There is no fear of revenue loss from print subscriptions if journal become open access, even as it increases readership and circulation of knowledge.” Various users are much skeptical about the commercials involved in open access journals as with a hard effort of writing the manuscript, it possibly doesn't bring any direct revenue for the author. However, it increases the reader base and is exponentially circulated in research community. The researcher strongly feel that this psychology of fear of revenue loss may pose as an impediment towards the growth and development of further publications in open access journals. Hence, analysis of this hypothesis will evaluate if the considers participants as well as other prospective authors will gain benefit of any sort by surfacing their manuscript to be publically accessible. On the evaluation of 12 dimensions (Research problems, Future Technology Supportability, Theory Decision Making, Fund Raising, Existing Technology, Technological Participation, Curriculum Competency, Knowledge circulation, Updating Professional Skills, Personal Skill Building, Skill Gap, and Career Building) of 1st phase of analysis considering 2 factors i.e. i) availability & awareness, and ii) Adoption of OAJ.

Table 2 T-value evaluation for Availability and Awareness

		Variables	IT-Streams		Non-IT Streams	
			T-Value	F-Ratio	T-Value	F-Ratio
1	Research Viewpoint	Research problems	23.88	1.47	21.39	1.24
2		Future Technology Supportability				
3		Theory Decision Making				
4		Fund Raising				
5	Educational Viewpoint	Existing Technology				
6		Technological Participation				
7		Curriculum Competency				
8		Knowledge circulation				
9	Institutional Viewpoint	Updating Professional Skills				
10		Personal Skill Building				
11		Skill Gap				
12		Career Building				

Table 3 T-value Evaluation for Adoption

		Variables	IT-Streams		Non-IT Streams	
			T-Value	F-Ratio	T-Value	F-Ratio
1	Research Viewpoint	Research problems	22.48	1.02	21.23	1.81
2		Future Technology Supportability				
3		Theory Decision Making				
4		Fund Raising				
5	Educational Viewpoint	Existing Technology	22.48	1.02	21.23	1.81
6		Technological Participation				
7		Curriculum Competency				
8		Knowledge circulation				
9	Institutional Viewpoint	Updating Professional Skills	22.48	1.02	21.23	1.81
10		Personal Skill Building				
11		Skill Gap				
12		Career Building				

The data tabulated in Table 2-3 is the probability of mistakenly rejecting a null hypothesis that is actually true. Considering a critical value $p = 0.05$ is generally taken as marking an acceptable boundary of significance. A large F-ratio signifies a small probability that the null hypothesis is true. Here, it can be seen that in case of an IT-Streams participants, hypothesis considering future technology supportability, research problems, and Personal Skill Building. In case of Non-IT Stream participants, the f-ratio value differs comparatively (f-ratio: 1.810). It can be seen that Personal Skill Building, Skill Gap, and Career Building should be considered. It was also seen that this statistical information quite differs from previous values that was considered for availability and awareness factor of OAJ. The critical variables seems here to be future technology supportability, Research problems as well as Skill Gap which shows that research viewpoint and educational viewpoint has a considerable impact on the usage of manuscript. Hence, if the analysis is viewed from research level, it can be said that a core resource for any researcher is prime evidences and information which has no relation with direct monetary benefits. The researcher gains much feedback from the other researcher community when the circulation of their manuscript is very high and there is no legal or financial impediment to access it. The success for any researcher is when they create a theory and their theory is studied and evaluated by a huge researcher community. In fact, it is one of the cost efficient procedures, which every researcher is adopting and will adopt to gain much reliability in their proposed theory when various critics provide their constructive criticism which accelerates the research direction much more effectively and less prone to errors.

Hence, the hypothesis-1 which claims that “Fear that revenue loss from print subscriptions if journal become open access, even as it increases readership and circulation of knowledge” is accepted on this empirical basis

1.6 STATISTICAL ANALYSIS FOR HYPOTHESIS-2

Hypothesis-2 claims that “Lack of IT infrastructure of the funds to develop it for using far more efficient online means of managing and publishing journals.” According to this hypothesis, if there is no potential availability of IT-infrastructure or enough research funds, it may be a major impediment for the proper management of intellectual properties. However, the researcher strongly feels that if the availability, awareness, and adoption of open access journals are on rise that the research base will soon become independent of such constraints. As managing the manuscripts which are available online is much easier and cost effective in nature when cumulative cost of research or education viewpoint is considered. This section will evaluate various cases of IT and Non-IT streams and will find out how far usage of online open access journals gives freedom from conventional IT infrastructure issues.

Table 4 T-value evaluation for Availability & Awareness

		Variables	IT-Stream		Non-IT Stream	
			T-Value	F-Ratio	T-Value	F-Ratio
1	Research Viewpoint	IT Infrastructure	18.26	1.37	19.36	2.14
2		Research Liberty				
3	Educational Viewpoint	Technological Acceptance	18.26	1.37	19.36	2.14
4		Global Scope				
5	Institutional Viewpoint	Knowledge Environment				
6		Technological Socialization Support				
7		Efficient Knowledge Management				
8		Technological Contribution				

Table 5 T-value evaluation for Adoption

		Variables	IT-Stream		Non-IT Stream	
			T-value	F-Ratio	T-value	F-Ratio
1	Research Viewpoint	IT Infrastructure	22.57	2.57	22.03	1.82
2		Research Liberty				
3	Educational Viewpoint	Technological Acceptance				
4		Global Scope				
5	Institutional Viewpoint	Knowledge Environment				
6		Technological Socialization Support				
7		Efficient Knowledge Management				
8		Technological Contribution				

This phase of analysis has attempted to understand that if the respondents are gaining benefits of managing their manuscript in online open access journal than they are least bothered about the availability of IT infrastructure. Research funding is one core part of base for making the research operational, however, the researcher also believes that there is always an alternate of socialization of technology which has got higher technological adoption with the information being reviewed and cited by upcoming critics. Hence, reliability of the research as well as the educational task is more when using open access journal. The data tabulated is the probability of mistakenly rejecting a null hypothesis that is actually true. Considering a critical value $P=0.05$ is generally taken as marking an acceptable boundary of significance. A large F-ratio signifies a small probability that the null hypothesis is true. Here, it can be seen that in case of IT-Stream members, hypothesis considering IT-Infrastructure, Research Liberty, Technological Acceptance, Knowledge Environment are very critical to consider. In case of on-IT Stream participants, the f-ratio value differs comparatively. It was also seen that this statistical information quite differs from previous tabulations (Table 4-5) that was considered for availability and awareness factor.

The statistical analysis performed in this section with respect to awareness, availability, and adoption of open access journal by both the streams of participant exhibits that IT-infrastructure, although a prime factor, is not a dominant factor as other factors Efficient Knowledge Management, Technological Socialization Support, and Knowledge Environment super-imposes it. Hence, logically it can be said that open access journal gives better platform of building the intellectual properties that has higher technical adoption, greater scope of study, and is always in continuous process of innovation. Moreover, it gives opportunity to the researcher or an academician to concentrate more on the development of theory cost effectively without many dependencies on IT-Infrastructure. Hence the second hypothesis "Lack of IT infrastructure of the funds to develop it for using far more efficient online means of managing and publishing journals" is accepted based on the statistical results.

1.7 STATISTICAL ANALYSIS FOR HYPOTHESIS-3

The final hypothesis claims that “Other obstacle includes uncertainty around copyright issues and lack of management support and clerical support.” Although the previous two hypothesis are accepted, but still it can be said that there are many crucial impediments towards the growth of open access journals. Various issues pertaining to copyright and management loopholes has been evidently there as there are no primary monetary benefits and hence slowly it is seen that new business models are evolving in even in the area of open access journal so that it can attract many authors and publishers with various intangible benefits to continue the growth in the area of education and research. This final phase of evaluation will assess the extent of awareness, availability, and adoption of open access journal to mitigate the existing issues shrouded in open access journals in order to evaluate the hypothesis.

Table 6 T-value evaluation for Availability, Awareness, and Adoption

SN	Variables	IT-Stream		Non-IT Stream	
		T Value	F-Ratio	T Value	F-Ratio
1	Research Viewpoint	5.549	5.549	7.636	7.636
2	Educational Viewpoint				
3	Institutional Viewpoint				

From Table 6, it can be seen that f-ratio for IT-Stream members is 5.549 and that for Non-IT Stream is 7.636. Hence, it can be said that the tabulated information can be determine whether the variances in two independent samples are equal. If the F-ratio is not statistically significant, it can be assumed that there is homogeneity of variance and employ the standard t-test for the difference of means. With an overall mean value of 3.333 for IT-Stream participants, it can be seen that research viewpoint is considered for performance criteria whereas with an overall mean value of 3.333 for Non-IT stream participants, the performance factor is institutional viewpoint. This indirectly states why a adoption is perceived higher than that of availability and awareness of open access journal. It also exhibits that technical adoption is highly dominant over awareness and availability factor in this phase of study. The tabulated information in Table 6 shows the F-ratio for both availability/awareness and adoption factor. The tabulation clearly shows that t-value of institutional Viewpoint is 11.93 which is the highest and f-ratio of the same is 0.31 which is the lowest of other two variables i.e. Research Viewpoint and Educational Viewpoints.

This section of statistical evaluation exhibits that with the availability of advanced technologies and the maximized acceptance of open access journals offers a prospect to reconsider their form and function as a medium to enhance scholarly communication. The open access e-journal is envisioned as a platform and a portal within the context of an open source community including a format and functions that enable it to achieve that objective. However, the prime issues explored against usage of open access journals are the clerical or administrative issues as well as possible damage to the peer review system. This issue potentially minimizes the cumulative quality of various journal publishing. Many participants of the open access journal continue to believe that the pay-for-access model is necessary to ensure that the publishers are adequately compensated for their work. Also, it was seen that manuscripts in some of the major open access journals are included in the standard bibliographic databases for their subject. Those established long enough to have an impact factor, and otherwise qualified. Hence, it can be said that issues do exists in this case and the hypothesis claiming “Other obstacle includes uncertainty around copyright issues and lack of management support and clerical support” is accepted signifying the future need of eradicating such issues for quality open access journal community

1.8 CUMULATIVE OUTCOME

The cumulative outcomes of the proposed study are as follows:

Usage Identification: Usage of open access journals is high among the teaching community (19.77%) specifically for drafting technical reports or research reports. Interestingly, it has also been seen for usage in designing lectures notes (18.37%) as well as personal communication with the faculty members of considered engineering colleges in Mysore. Also, due to competitive academic environment, the faculty members are also found to use open access journals in current awareness services (15.35%). It was also explored that 12-15% of the respondents uses open access journals for workshop proceedings, referring online journals, and even updating their technical skills. Hence, it can be seen that availability, awareness, and adoption of open access journals are quite higher in the case study considered.

Information Extraction: It has been seen that approximately majority (20%) of the participants uses open access journal only for their teaching and research work, which shows greater degree of technical adoption of open access journal. However, this information extraction pattern is not that easy as it looks as it was found that majority of the participants (26.98%) took nearly 1-2 years of usage time to get familiar with the actual pattern of using open access journal. 25-27% of the respondents has also reported that they took nearly 5-10 weeks to 1-3 weeks to get familiar with the usage pattern.

Usage History: The qualitative study performed has exhibited an optimistic result when it is found that 24.42% of the respondents has the usage history of open access journal for 5-6 years followed by 23.02% of the respondent group who has used it for 7-8 years. 20.70% of the respondents have also usage history of 3-4 years. Interestingly, some senior professionals (6-10%) have also shared that they have been an active part of open access journal for near about 9-10 years. Also, the frequency of monthly usage was claimed higher by 27.21% of the respondents, while 22-24% of the respondents claimed that they use it almost daily and weekly. Hence, it can be only said awareness, availability, as well as adoption of open access journals were always higher.

Dependency Factor: When the usage history and frequency is highly optimistic, it is quite evident that the respondents have explored some critical dependency factor for the usage of open access journals. 61-80% of the respondents reported that they are dependent on open access journals for their laboratory experiment purpose. Below 20% of the respondents are dependent on open access journal for teaching purpose while 21-40 % of the respondents use it for research purpose. 81-100% of the respondents claimed the dependency factor is preparation of seminars and workshop materials.

Preferred Database: 15.12% of the respondents reported that they use ASCE journals followed by 11.16% of the respondents to be using CRIS INFAC Ind. Information database. 10.47% of the respondents prefer to use Engineering Science Data Unit. 9.07% of the respondents claimed their choice as the famous Elsevier Science Direct Journals and IEEE Electronic Library, while Springer has found its less preferred choice as only 5.12% of respondents. However, 10.47% of the respondents group reported their preferred database as ACM digital library.

Professional Need: Majority of the participants (109 numbers) claimed that open access journals acts as supplementary to hard copy journals available in the library followed by 95 members who reported that open access journals assist their profession in subscribing to online journals as it is one of the cost effective method. Also 68-69 members claimed that open access journals assist their profession in projection of latest advancement in technologies as well as it is one of the quicker means of getting access to primary sources.

Level of Satisfaction: to determine the performance of any product, it is necessary that customer's satisfaction level should always be measured. In the proposed study, it was found that majority of the respondents (62.33%) are highly satisfied with the resources available in open access journals. Although, it was also seen that 37.67% of the respondents are not that much contented with the resources

available in open access journals.

The scope of the proposed study is as following

Accelerated discovery. With open access, researchers can read and build on the findings of others without restriction.

Public enrichment. Much scientific and medical research is paid for with public funds. Open access allows taxpayers to see the results of their investment.

Improved education. Open access means that teachers and their students have access to the latest research findings throughout the world.

1.9 CONCLUSION & SUGGESTION

The study has witnessed various utilization trends towards the Open Access Journals (OAJ) over past few years along with the academic benefits and issues associated with it. The current study has been conducted in 6 reputed engineering colleges of Mysore, Karnataka, where the participants were mainly faculty members of the respective colleges. There are many ways that libraries can work to spread OA awareness and encourage changes in disseminating new knowledge. A compelling argument to present faculty on the issue of open access can be in the direction of studying the citation patterns for open access and closed access articles in philosophy, political science, electrical and electronic engineering, and mathematics. This research can be expected to show that open access articles are more frequently cited than closed access articles. A graphical representation of open access' impact in specific disciplines' citations can be found under the Researchers tab at the OASIS web site demonstrating higher citation rates for open access articles in maximum number of disciplines. In fact, it's beginning to be obvious that the larger audience supported by OA-enabled viewing does result in greater and faster impact in one's field. Institutional repositories are springing up at most universities, and they provide an avenue for faculty and students to archive and make publicly and freely viewable not only articles but images, field notes, raw data, in fact anything digital or digitized.

Libraries should continue raising awareness of open access at their libraries and larger institutional organizations. Consider developing a library-wide common understanding of OA and how your library would want to present or frame OA for your larger institution. Starting points for resources include SPARC (Scholarly Publishing & Academic Resources Coalition), and the ACRL Scholarly Communications Committee. Another consideration might be to create an institutional OA subsidy fund to provide financial support for OA publishing fees. Approaches to OA should be shaped to match institutional priorities and values; one size will not fit all libraries or their larger institutions. Although this article focuses on open access as it relates to academic libraries, public libraries can also educate and make the public aware of open access information. It would be interesting to hear how other library sectors are approaching OA and as always, examining what others have done will help shape a libraries unique approach. And then, in the spirit of scholarship and research, be sure to share your practices, findings, and learning with the greater community to continue developing the open access issue—just remember to do it openly.

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