Librarians' role as change agents for institutional repositories: A case of Malaysian academic libraries

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ABSTRACT

The primary reason for establishing an institutional repository is to increase the visibility of the institution's research output by making it Open Access. Academic libraries are becoming very involved in managing electronic scholarly products and participating in the evolving scholarly communication process through institutional repositories. Although institutional repositories can make room for easier access to universities' research output, unfortunately it is not fully developed in some academic institutions. The origin of this problem is that there are known instances where librarians in-charge of institutional repository are unaware of their roles, and are unskilled in implementing the institutional repository. This paper describes a study conducted on the roles of librarians in the deployment and content recruitment of institutional repositories in eight (8) universities in Malaysia. Sample for this study are librarians who are involved with the development and implementation of institutional repository in their respective universities. The study reveals that the act of collecting materials for depositing is mainly done by librarians rather than the authors and researchers. Providing training sessions, holding meetings in departments and faculties, and also linking of the institutional repository website from the university and faculties' website have the highest rank in librarians' approach to promote the institutional repository. The paper also discusses the process of depositing, motivation factors, roles, marketing and benefits of institutional repository that will have reference value for the librarians who desire to embark on an institutional repository.

Keywords: Institutional repositories; Digital libraries; Roles of librarians; Academic libraries; Open access initiatives; Malaysia

INTRODUCTION

The main idea of an institutional repository is to organize the output and digital content as well as educational and archival materials in universities and academic institutions. Institutional repositories are becoming a new method of academic scholarly communication and dissemination and are considered as an ideal vehicle for making the work of an institution more visible. The term "institutional repository" may have dissimilar meaning to different people (Allard et al. 2005). As the concept is rather new, there are

diverse opinions on its meaning (Bailey 2005). Generally an institutional repository is an electronic system that captures, disseminates and preserves intellectual results of a group of universities or a single university. Lynch (2003) has defined a university institutional repository as a collection of services that a university proffers to its own members intended for the management, organization and diffusion of digital works produced by these members. Crow (2002) and Ware (2004) characterized an institutional repository as open, interoperable, cumulative, perpetual, contributes to the process of scholarly communication in collecting, storing and disseminating the scholarly content. The Scholarly Publishing and Academic Resources Coalition (SPARC) position paper declared that "Institutional repositories—are digital collections capturing and preserving the intellectual output of a single or multi-university community, providing a critical component in reforming the system of scholarly communication--a component that expands access to research, reasserts control over scholarship by the academy, increases competition and reduces the monopoly power of journals, and brings economic relief and heightened relevance to the institutions and libraries that support them" (Crow 2006).

The primary reason for establishing institutional repositories is to increase the visibility of the institution's research output by making it Open Access. In Malaysia, a number of universities have been involved with implementing institutional repository services to increase the visibility of university's research output. Abrizah (2010) reported that a small number of research universities in Malaysia have established, or are partway to implementing institutional repository services to increase the visibility and the influence of the research generated within the university. The development of the institutional repository services is related to the Open Access movement in Malaysia, which seeks to make valued research outputs openly available by encouraging academics to place their publications into repositories, enhancing their availability and visibility to the global academic community and increase the chances for use and exchange of ideas among scholars within similar disciplines (Abrizah et al., 2007). The Open Access movement in Malaysia had a direct impact on the development of the institutional repository services, which has the activity to encourage academics to place their intellectual works into repositories. Therefore the effect will appear in increasing the academics visibility and enhance the collaboration between scholars (Zainab 2010).

Academic libraries are a group that can make major contributions in the deployment and content recruitment of institutional repositories as they are becoming involved in managing electronic scholarly products and participating in the evolving scholarly communication process. Libraries acquire electronic resources. Actually, creation of digital content to archive and preserve is known as a role for librarians. They are being funded to digitize valuable parts of their special collections, especially theses and dissertations, both to preserve the original and make the content readily accessible. As institutional repositories are flourishing to preserve scholarly output and to make it openly accessible, more and more academic libraries are in favour to provide open access to the universities' research output, maintained either institutionally or on a subject basis. Open Access and institutional repositories may result in considerable savings for libraries besides the potential benefit for authors of greater exposure to their works. Although the future shape of scholarly communication in institutional repositories remains unclear due to its lack of contribution by the stakeholders (Abrizah 2010), what is clear is that library and information professionals have key roles to play (Revell and Dorner 2009). Managing of repositories and electronic archives has become a duty of librarians in the 21st century. Development of repositories has led to key issues of librarians' roles in scholarly communication.

This research is concerned with the activities of the academic library with respect to institutional repositories. It seemed important to gain an understanding of what motivates the libraries to offer Open Access services and it was hoped that by understanding this it might help with the design of future advocacy of the institutional repository. The main purpose of this research therefore is to investigate and highlight the roles of academic librarians in the implementation and promotion of their institutional repository and also understand the motivation factors for development of the repository in their respective universities.

LITERATURE REVIEW

There are reasons to indicate that the library can take up the responsibility for setting up and implementing the institutional repository. First, traditionally everyone knows the library as preserver of scholarly literatures (Cervone 2004). Secondly, librarians are professionals, trained to create metadata and content organization. They are conscious of the preservation of digital materials and self archiving techniques (Ware 2004). The characteristic of the library as a technology hub in universities is the third reason to confirm why the library should be in charge of institutional repositories. Students, faculty members and staff expect technological support from the library; they look to the library as a leader on information technology tendency (Phillips et al. 2005). Library leaders are also aware of relations with faculties and researchers in developing a successful institutional repository. Librarians know better than anyone else, how to reduce the budgets and increase the cost of resources in running an institutional repository (Chang 2003; Phillips et al. 2005).

In the search for relevant literature on the roles of librarians in the setting up of institutional repositories, the following themes emerged:

a) ***Collection management and stewardship of collection:*** Literature indicates that librarians have a critical position in the collection management and preservation through institutional repositories. Librarians have the capability to add authors or give permission to authors to self archive materials in the repository (Crow 2002; Harnad 2001; Lynch 2003). Librarians upgrade their knowledge synchronously with information environment and can adapt themselves with their new roles as a collection administrator of digital materials (Branin et al., 2000; Lee 2000; Pettijohn and Neville 2003). Literature also indicates that librarians are facing problems in collection management because the acquisition of collections is in the hands of faculties (Allard et al., 2005). To settle the contents of institutional repository, students and faculties as authors should be involved with self archiving to submit their works to institutional repository (Barton et al., 2003; Bell 2004; Campbell et al., 2004; Cervone 2004; Crow 2002; Gadd et al., 2003; Johnson 2002; Mackie 2004). But, it is crystal clear that after acquisition the collection needs supervision, which should be the responsibility of the librarians. Authors are in charge of selecting items to add to repository and librarians are the stewards of this collection (Genoni 2004) especially for preserving the repository (Wheatley 2004). There is no doubt to entrust this responsibility to librarians since history shows librarians have navigated the way in using and designing new technologies. Librarians are expert in adjustment with new changes and professional in development of the environment (Branin et al. 2000).

b) ***Understanding of software and giving training to authors:*** Deciding about the software is the first step in creating an institutional repository and literature shows

that librarians have enough knowledge of working with institutional repository software. Allard et al., 2005 contend that librarians should comprehend the software with the intention that they can design repositories in their libraries. They should also have the ability to create institutional repository that is useable by the software extender since authors and their contributions in institutional repository is one of the significant elements in the development of institutional repositories. With a consideration of natural extension of preparation and training of users, librarians should educate authors to deposit their intellectual works to institutional repositories. Education would consist of assisting university community to learn the use of institutional repository software to accomplish self archiving (Abrizah 2010).

c) ***Establishing a standard metadata and comprehensive catalogue system:*** In the past, metadata was defined as a role for librarians but now authors have authorization to submitting metadata. Librarians should establish the clear metadata standards so that authors can use it. The standards can be provided as a set of development guidelines for institutional repository creators. It can help authors to do self archiving with the predicted contents and standard metadata. Abrizah (2010) pointed to the creation of guidelines concerning metadata as a task for librarian. During an effort to provide a complete repository which can cover unique items, librarians should prepare a comprehensive system for cataloging and indexing the materials.

d) ***Review submission for quality of content:*** Quality content verification is another essential need for the development of an institutional repository. Because self archiving by authors is an important component of institutional repository, the existence of a group that have the ability to review the quality content of final submissions and check the metadata is necessary. Lynch (2003) believes that the institutional repository environment would be orderly if librarians can be answerable to this role because some institutional repositories do not want to take author's assistance due to the need of quality checks (Lynch 2003).

e) ***Persuading authors to contribute with self archiving:*** Self-submission of material by faculty members need librarians' enthusiasm and in the learning process of self archiving, authors need to be exposed to awareness about copyright issues and become familiar with new technologies. Unfortunately past studies show that faculty members do not carry out self-submission. Swan and Brown (2005) found that the majority of authors were unconscious about the benefits of publishing their works in institutional repository. Their research showed less than one third of the respondents were using OAI search engines to find out their required information through the institutional repository and only 10% of the authors were aware about SHERPA/RoMEO list of publishers' permissions policy with respect to self archiving (Swan and Brown 2005). Lack of authors' desire in depositing their works in the institutional repository, could be the main reason for the slow growth in the development of institutional repositories. According to McDowell's research, all involved librarians in institutional repository development in Census of Institutional Repositories in the US, reported that they are facing problem in taking on contents from graduate students, faculties and researchers (McDowell 2007). So, cheering of authors to deposit their intellectual works through self archiving to institutional repository in order to enable development of collection is considered as librarians' task. In some cases self archiving is a tough task for some authors. A study in University of Glasgow shows that submitting outputs of researchers on behalf of those who cannot self archive their materials is another solution to make them contribute (Genoni 2004).

f) **Training users search technique in institutional repository:** Librarians as crucial bodies in developing institutional repositories should help users and authors to fill content into the institutional repositories and guide them to extract from institutional repositories. They should teach users that how they can recruit search techniques to use the available resources. Preparing the connections for making materials accessible for users is an opportunity to persuade them to become involved with institutional repositories. Since understanding of user's needs is the base of development of metadata and research tools, building a search interface that makes possible searching and accessing to the materials in institutional repositories, is a duty for reference librarians. Beside this, it facilitates search and increase access to resources and information, bringing the institutional repository contents together in library database or library catalogs. Inclusion of institutional repository content in databases and catalogs will increase the chance of researcher to find their relevant resources (Jenkins et al. 2005).

g) **Promotion and marketing:** Librarians can provide a team with essential information to promote institutional repository. With recognition of organizations and departments as potential institutional repository communities they can promote and develop their library's repositories. Institutional repository concept may need more explanation, marketing and a multiplicity of concerns by librarians (Jenkins et al. 2005) (Jenkins et al. 2005). It is essential that librarians be familiar with the library repository to efficiently promote institutional repositories. Beside, providing good search tools and cataloguing the repository materials will make institutional repository contents more accessible.

OBJECTIVES AND METHOD

The aim of this study is to contribute to the literature on academic librarianship by exploring academic librarians' role as change agents for institutional repositories. The following threes objectives were set in this study:

a) To explore the academic library's motivation and the processes involved in providing open access to the university's research output;

b) To establish librarians' views concerning their roles in the implementation of digital repositories and, particularly, their established institutional repositories;

c) To gain librarians' perception on the level of success of their institutional repository implementation.

The research has focused on answering the following research questions:

a) What motivates the academic library to implement an institutional repository?

b) What are the processes involved in depositing of research materials in the established institutional repository?

c) What are the perceptions of academic librarians about their roles in the implementation of institutional repository?

d) In what ways are subject librarians promoting (or planning to promote) institutional repository to their clients as an information resource?

e) How successful has the institutional repository been in dissemination of information and scholarly communication?

The study has adopted a quantitative research design and a web based survey method was used for data-gathering. The subjects of the study were librarians who are involved with the planning and implementation of their institutional repository. As the population of the

study was not known, an e-mail invitation to participate in the survey was sent out to eight (8) institutional repository managers from the Malaysian academic libraries[1] listed in both Open Directory of Open Access Repository (OpenDOAR) (www.opendoar.org) (Table 1) and Registry of Open Access Repositories (ROAR), which are authoritative directories of academic open access repositories. This is termed the sample-based population. The institutional repository managers or librarians heading the institutional repository project were requested to forward the e-mail to other librarians in their respective library who are also working on the institutional repository. The e-mail, which contained a hypertext link, enables the survey participants to link to the survey database hosted by SurveysPro (www.surveyspro.com). After three rounds of distribution, responses were received from 21 librarians. The total number of usable, fully completed questionnaires was 16 comprising 5 librarians from UM, 3 UKM, 2 from UPM and USM respectively, and one each from the other 4 libraries (UTM, UUM, UniMAP and UNITEN). Descriptive statistics using frequency distributions, percentages and mean were performed to analyse the data.

Table 1: Academic Libraries with Institutional Repositories Listed in OpenDOAR
(http://www.opendoar.org/)

Academic Library	Institutional Repository	URL	Birth Date[2]
Universiti Kebangsaan Malaysia (UKM)	PTSL UKM Repository	http://ptsldigital.ukm.my/	29 Aug 2007
		http://eprints.ukm.my/	
Universiti Malaysia Perlis (UniMAP)	UniMAP Library Digital Repository	http://dspace.unimap.edu.my/	21 May 2007
Universiti Putra Malaysia (UPM)	Universiti Putra Malaysia Institutional Repository (PSAS IR)	http://psasir.upm.edu.my/	23 April 2008
Universiti Sains Malaysia (USM)	ePrints@USM	http://eprints.usm.my/	17 April 2008
Universiti Teknologi Malaysia (UTM)	UTM Institutional Repository	http://eprints.utm.my/	26 Jan. 2007
Universiti Utara Malaysia (UUM)	UUM IRepository	http://eprints.uum.edu.my/	20 June 2007
University of Malaya (UM)	UM Digital Repository	http://eprints.um.edu.my/	25 Feb 2008
	MyManuskrip: Digital Library of Malay Manuscripts (Pustaka Digital Manskrip Melayu)	http://mymanuskrip.fsktm.um.edu.my/Greenstone/cgi-bin/library.exe	
	DSpace@UM	http://dspace.fsktm.um.edu.my	
University Tenaga Nasional (UNITEN)	UNITEN Digital Repository)	http://dspace.uniten.edu.my/xmlui/	29 Jan 2010

To verify the birth date of the university institutional repositories, librarians were asked to indicate how long their library had been involved with the planning or implementation of an institutional repository. Then, a cross tabulation was done between universities and the number of years in which they have been involved with planning or implementing an institutional repository in their universities (Table 2).

The study revealed that universities in Malaysia started the implementation of institutional repositories at different years. It can be observed from Table 2 that there is a variance in

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[1] Malaysia has 11 institutional repositories listed in OpenDOAR, however only eight of them are deployed by academic libraries. Malaysia has 17 institutional repositories listed in ROAR, and the same eight are deployed by academic libraries.

[2] The Birth date of the Institutional Repository Listed in ROAR (http://roar.eprints.org/)

their responses on when planning and implementation actually started. For example, five librarians from the University of Malaya (UM) gave different responses on the implementation of the institutional repository; ranging from one to four years. This variance could be as a result of the number of years they have worked under the institutional repository project. Also, the difference in variation could be because some of the universities have more than one digital repository and these repositories were initialized in separate years. However, results clearly indicated that UKM, UM, UTM and UUM were among the early adopters of institutional repositories in Malaysia

Table 2: University/ Involvement Years (n=16)

University	Year					Total
	1 year	2 Years	3 Years	4 Years	5 years	
UM	1	2	1	1	0	5
UNITEN	1	0	0	0	0	1
UniMAP	0	0	1	0	0	1
USM	1	0	1	0	0	2
UTM	0	0	0	1	0	1
UUM	0	0	0	1	0	1
UPM	0	0	2	0	0	2
UKM	0	1	0	0	2	3

FINDINGS AND DISCUSSION

This section discussed the findings by analyzing key elements in the data relevant to answer each of the five research questions.

Research Question 1: What motivates the academic library to implement an institutional repository?
Librarians were first asked on the motivation of university to develop an institutional repository. Responses were provided in a "check all that apply" format. Table 3 presents the motivation in the provision of institutional repository as perceived by the respondents in ranked order. From the ranked responses, increasing the visibility of the institution's research output indicated as the main motivator reason to implement an institutional repository. It is followed by preserving the institution's research output and providing free access to it whereas monitoring productivity and reactive responses from requests from universities and faculties are known as the lowest rank.

Table 3: Motivation to Develop an Institutional Repository

Motivation	Frequency	Percentage (%)
To increase the visibility of the institution's research output	14	87.50
To preserve the institution's research output	13	81.25
To provide free access to the institution's research output	9	56.25
To help evaluate the research productivity of departments	6	37.50
In response to requests from University	4	25.00
In response to requests from faculty	2	12.50

Research Question 2: What are the processes involved in depositing of research materials in the established institutional repository?

Librarians were asked to choose the best statement that describes the process of depositing materials in their current university institutional repositories. The following results obtained from the analysis: (a) self-deposition without quality control is not an acceptable option, (b) Academics prefer librarians to handle deposition and monitor quality control, (c) They welcome to collection of resources by librarians, independent of authors. This result clearly indicates the expected role of academic librarians of populating and maintaining institutional repositories.
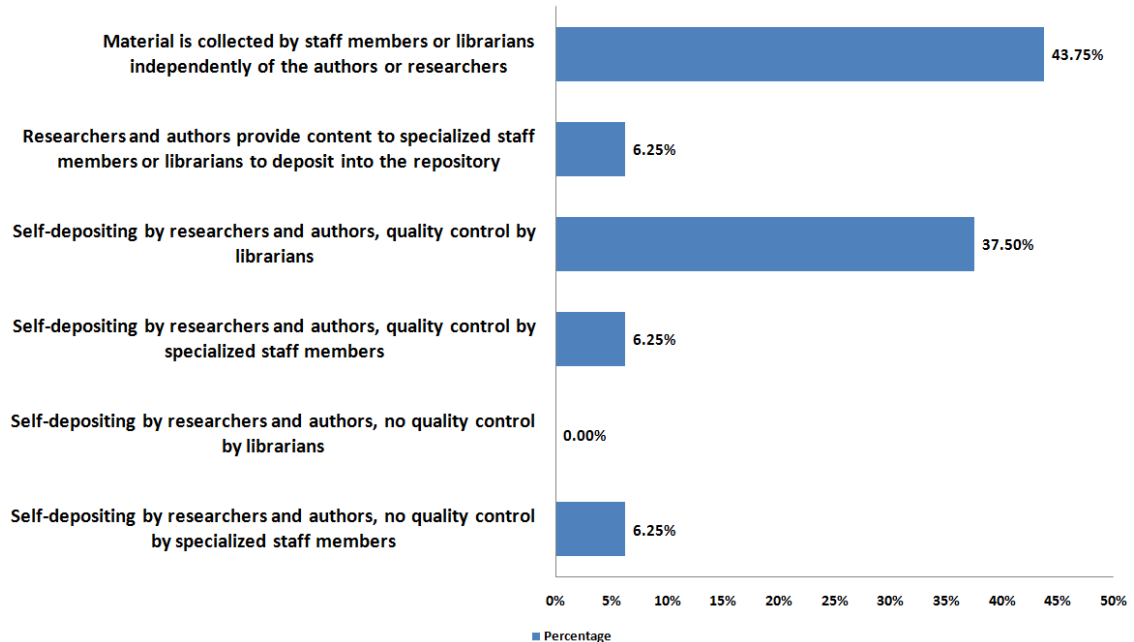

Figure 1: Processes Involved in Depositing Materials in the Institutional Respoitory

Research Question 3: What are the perceptions of academic librarians about their roles in the implementation of institutional repository?

Librarians in this study were asked to state their assumption about their roles in implementing of their universities institutional repositories. Responses were provided in a "check all that apply" format. Table 4 presents the opinion of librarians concerning their roles in the implementation of institutional repository as perceived by them in ranked order.

The result shows that librarians accepted their role as the promoter of institutional repository initiatives by encouraging authors to submit their work directly. It seems to be reluctance to accept the role of selector of resources, train about self archiving and its issues by librarians. Understanding the software, acting as steward of the collection and reviewing the final submission are known as the three unpopular roles among librarians in the implementation of institutional repository. The study found that half of the respondents reported they personally support anyone in developing and supporting institutional repository. They mentioned the details of their personal supportive roles to others in developing institutional repository in the form of: a help to other universities in

developing their repositories; sharing of experiences with other librarians, advising and training librarians on the way that they can improve the institutional repository.

Table 4: Librarians' Roles in the Implementation of an Institutional Repository

Roles	Frequency	Percentage (%)
Librarians play a leading role in the institutional effort like encouraging authors to submit their work directly	13	81.30
Librarians can only act as selectors of materials	5	31.30
Librarians can only educate faculty members and authors regarding self archiving issues	5	31.30
Librarians can only play as a trainer of authors on self archiving	5	31.30
Librarians only need understanding of the software which is required for the institutional repository	4	25.00
Librarians act as steward of the collection	4	25.00
Librarians can only act as submission review	3	18.80

Research Question 4: In what ways are subject librarians promoting (or planning to promote) institutional repository to their clients as an information resource?

Marketing of institutional repository is one of the efforts needed to be done to promote the use of institutional repositories, which can be done best by reference or subject librarians. They can recognize departments, faculties and organizations which have possible institutional repository communities. By increasing faculty members' and researchers' knowledge about positive aspect of institutional repository, librarians can encourage them to a partnership in institutional repository development (Jenkins et al. 2005). Respondents were asked to state the ways that librarians are marketing institutional repository to faculty and scholars. Responses, also offered in a "check all that apply" format listed the following ways in ranked order: providing training sessions for future (12, 75.0%), speaking at departmental and other faculty meetings (12, 75.0%), and linking of the institutional repository website to the university and faculties' website (11, 68.8%). A small number indicated creating and distributing brochures as well as publishing information as ways to promoting institutional repository to their clients as an information resource. Table 5 presents these findings.

The following conclusion can be made from these findings. Librarians provide opinion and innovation to others in the system formally through training sessions and meetings with faculty. This makes sense as it connects with earlier findings that librarians play a leading role in the institutional repository by encouraging authors to self-archive. It shows that the librarians have been promoting institutional repositories to opinion leaders, in this case the authors, who are in a position to influence others to use new technologies (Rogers 2003). Rogers in his Diffusion of Information (DOI) theory suggests that if change agents' communication campaigns are not carried out in an effective manner, the adoption of an innovation will be slow or unsuccessful. Revell and Dorner (2009) contend that subject librarians are in a strong position to act as change agents by promoting institutional repositories as an innovative resource while assisting or training students and academics in identifying potential sources to meet their information needs (Revell and Dorner 2009). Both authors argue that the library can do promotional campaigns using handout pamphlets and web sites; however nothing works much better that working with the "opinion leaders" in the promotion of institutional repositories. Perhaps librarians who

have not worked with the faculty consider their institutional repositories to be insufficiently developed to warrant allocating resources for a promotional campaign.

Table 5: Ways of Promoting the Institutional Repository

Promoting ways	Frequency	Percentage (%)
Providing training sessions for future	12	75.00
Speaking at departmental and other faculty meetings	12	75.00
Link the Institutional repository website to the university and faculties website	11	68.80
Creating and distributing brochures or other informational material	6	37.50
Publishing information in newsletters or other local publications	4	25.00

Research Question 5 How successful has the institutional repository been in dissemination of information and scholarly communication?

Respondents were asked to estimate the success level of their institutional repositories in disseminating the university's research output. The level of success as perceived by the respondents is measured on a scale from 1 to 5 as follows: 1 = not successful at all; 2 = not very successful; 3 = quite successful; 4 = successful; and 5 = very successful. Figure 2 shows the mean scores of perceived level of success. On the average, the respondents considered their institutional repositories as successful in terms of providing free, open and timely access, and preserving and providing long term access to the institution's scholarship (m=4.0 and m=4.06 respectively). Enhancing the visibility of the institution and preserving and providing stewardship were also perceived as successful. Respondents indicated that educating the faculty on the aspects of open access, copyright issues and scholarly communication had been quite successful.

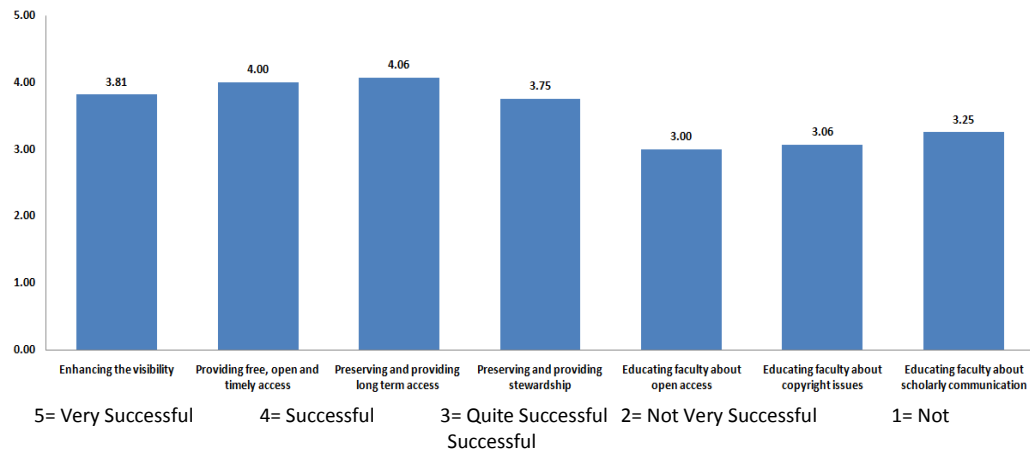| 5= Very Successful | 4= Successful | 3= Quite Successful Successful | 2= Not Very Successful | 1= Not |

Figure 2: Success Level of the Institutional Repositories in Achieving the Intended Benefits

This finding points to at least three important conclusion with regards to the success of the institutional repositories in dissemination of information and scholarly communication. First, none of the librarians felt that their institutional repositories have been very

successful in disseminating the university's research output. Second, in general librarians felt the institutional repositories have been successful only in their objective to capture, disseminate and preserve intellectual results of the university. Third, the librarians still need to communicate to the faculty about the values and issues in the deployment of institutional repositories, indicating that they still need to work on the promotion of the institutional repositories as an information source to the stakeholders.

CONCLUSION

The paper reports academic librarians' motivations and the processes involved in providing open access to the university's research output, establish views of librarians concerning their roles in establishment of institutional repositories, and determine the librarians' perception on the level of success of their institutional repository implementation. The study has adopted a quantitative research design and conducted through a web based survey.

The findings of this study indicate that increasing the visibility and preserving of the institution's research output are the two highest motivation reasons whereas response to requests from faculties is in the lowest rank between the motivation reasons in developing of an institutional repository. This is especially true when Crow (2006) revealed that one of the primary profits of publishing in institutional repositories pertain to enhanced professional visibility of the researchers work. The analysis also concludes that most of the materials are collected by staff members or librarians independent of the authors or researchers. This study supports those by Swan and Brown (2005) who mentioned that a strategy is needed to encourage authors and researchers to participate in self archiving and depositing their work into institutional repository. A majority of the respondents indicated that playing a leading role in encouraging authors to submit their work directly to the institutional repository is the main role for librarians in implementing of an institutional repository. Both providing training sessions, and speaking at departments and faculties meetings, were the most significant ways for promoting institutional repositories, while publishing information in newsletters or other local publications was the infrequent way of marketing of an institutional repository to faculties and scholars. Providing free, open and timely access to the institution's scholarship is known as the most useful benefit for institutional repositories users.

The findings will assist librarians to improve their university institutional repositories and enable them to find a better way to promote their university institutional repositories to researchers. Encouraging authors to do self depositing will enhance the visibility of the scholars. The profile of authors will be increased due to the huge access as it is free. Moreover, all researchers' intellectual works will be collected in one place. Development of the institutional repositories and populating them with contents requires hard effort. Librarians should encourage authors to submit their works to their university institutional repository. Literatures illustrate that submission of intellectual works by authors depends on the culture of scholarly communication within the institutions or universities. Reference and subject librarians are familiar with different library culture and environments, so they are the best option to encourage authors to submit their work into institutional repository.

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