POPULATING INSTITUTIONAL REPOSITORY: FACULTY'S CONTRIBUTION AND ROLES OF LIBRARIANS[1]

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ABSTRACT

Institutional Repositories (IRs) are predicated on contributions by members of a university community, particularly faculty members. In fact, faculty contribution are crucial to the success of an IR even though several studies have found low rates of faculty submission. In order to address low submission rates and provide an (IR) that will preserve and disseminate research materials, a research-intensive university in Malaysia conducted a web-based survey to investigate faculty's use of open access repositories, advocacy undertaken, and attitudes toward the contents of IR. Responses were received from 131 academics from 14 faculties, institutes and centers at the university. Research questions posed were, among others "Are faculty members aware of Institutional Repositories? What is their opinion about IRs? Are they willing to contribute in IR, if they are given a chance? One half of the respondents mentioned allowing, or even encouraging, the deposit of theses and dissertations. Findings indicated that, as users the academics wanted to find many more types of material in the repository and as authors, they were willing to deposit, particularly to disseminate their work and receive feedback, and also to support the principle of open access. The greatest deterrents to contributing were the risk of being unable to publish elsewhere later, the ownership of copyright, and plagiarism. However, the faculties in this study are poorly informed on institutional repositories, with almost two-thirds not knowing if their institution has one. This low level of awareness may be due to the university library managing its repository, using librarians to collect and deposit materials on behalf of faculty members. The implication is that the librarians has an important role to play with regard to the relationship with self-archiving authors, which is the key characteristic of IRs. The paper has identified the following roles for librarians in an IR environment: (a) Understanding the IR software used; (b) Publicity and advocacy of IR; (c) Establishing an institutional mandate; (d) Educating faculty regarding self-archiving issues; (e) Submission review for content and metadata; and (f) Training of authors. Based on methodical IR development informed by best practices in the Open Access community, the findings from this study have been used for repository design customizations and functionality enhancements that complement the needs, interests and concerns of the faculty. An outcome of the research is an institutional repository (IR) to support for a new pattern for scholarly communication, apart from servicing the university's research output.

Keyword : *Institutional repositories, Open access publishing, Scholarly communication; Faculty contribution; Librarians' roles; Malaysia*

INTRODUCTION

Institutional Repositories (IRs) are now becoming a component of the technical infrastructure in research intensive institutions and a favoured option for providing open access to research output. Foster and Gibbons (2005) define an institutional repository as "an electronic system that captures, preserves and provides access to the digital work products of a community". Crow (2002) and Ware (2004) characterise the following features of a IR: (a) It is institutionally defined and it captures only the intellectual property of the host institution such as purely scholarly work, or administrative, teaching and research materials, both published an unpublished; (b) It is open an interoperable and the primary goal is to disseminate the institution's intellectual output; (c) It is cumulative and perpetual and this carries with it a long term obligation on the host institution to preserve IR content; and (d) It contributes to the process of scholarly communication in collecting, storing and disseminating the scholarly content. As such authors and researchers can deposit materials in IRs, subject to copyright, with the host institution providing the infrastructure for these materials to be properly organized, archived and disseminated.

This infrastructure has emerged since 2002 when major research universities in the U.S.A (such as MIT and Cornell University, using DSpace), and the U.K. (Southampton and Oxford University using E-print) launched their own IR systems. Over the past 4 years, an increasing number of research universities has implemented or plans to implement an IR (Markey et al. 2007). Lynch and Lippincott (2005) found that out that in the USA, of 97 universities categorized as "doctoral universities", 40% already operated IRs. Among non-implementers, 88% were found to be in the planning stage of IR implementation. A survey in 2005 was undertaken at universities in ten European countries – Belgium, France, the United Kingdom, Denmark, Norway, Sweden, Finland, Germany, Italy and the Netherlands (van Westrienen and Lynch, 2007). It was found that the number of IRs varies from as low as 1.5% of universities in Finland to as high as 100% in Germany, Norway and the Netherlands, with the focus on acquisition of content almost exclusively on collecting faculty

publications. By mid 2006, all Australian universities had established IRs, for the purpose of giving researchers a vehicle to enhance the availability of their publications by making them available via open access (Henty, 2007).

A few research universities in Malaysia have established, or are partway to establishing IR services with the aim to enhance the visibility and the impact of the research generated within that university. The development of the IR 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). At the same time, university research increasingly involves the use, generation, manipulation, sharing and analysis of digital resources. However, not every institutional repository adopts the principle of open access and it is possible for the institution to restrict the access to its member (www.opendoar. org). The University of Technology

Malaysia (UTM) and the National University (UKM) for example allows access to some theses, dissertations and programme to members of the institution only. This characteristic fits Clifford Lynch's framework of institutional repositories - 'a set of service that a university offer to the members of its community for the management and dissemination of digital materials created by the institution and its community members' (Lynch, 2003).

This research is concerned with the activities and attitudes of an IR stakeholder – the academicians – with respect to open access publishing in IRs, and understanding the role of the academic library in providing this research infrastructure. There are some research studies which are close to this goal. In order to understand the requirements to provide an IR that will preserve and disseminate research materials created by or associated with a research intensive university, the present study began with an extensive search for information concerning faculty's contribution towards open access publishing and institutional repositories. It was apparent from this review that

there has been research which focused on the needs and potential contribution of faculty, as well as the librarians' roles in this area.

LITERATURE REVIEW

In research universities, IRs are predicated on contributions by their stakeholders which include both academic and non-academic staff; those involved in teaching and research; and both postgraduate and undergraduate students. Each of these groups contains potential authors and readers of the materials in IR, and the contributions of authors, are critical to the success of an IR. As such whether or not IRs become a part of the intellectual infrastructure depends on the extent of the university's community contribution. Shearer (2003) argues that the success of an IR should be determined by its use, and one of the measures of usefulness is contribution of content. Faculties are typically best at making a major contribution to an IR, by creating, not preserving, new knowledge, because they are becoming so involved in producing scholarly works and participating in the evolving scholarly communication process. As IRs are flourishing to preserve scholarly output and to make it openly accessible,

more and more faculty members are in favour to provide open access to the universities' research output, maintained either institutionally or on a subject basis. Faculty contribution is considered one of the success factors for an IR even though several studies have found low rates of faculty submission (Chan, 2004; Foster and Gibbons, 2005; Pelizzari, 2005; Davis and Connolly, 2007). These studies found that the challenges for an IR are not in the technical implementation but in affecting the culture changes necessary for it to become an integral part of activities of the research institution. Cultural rather than technological factors limit the use and development of IRs. Literature suggests that ingrained behaviours, inertia, indifference and resistance to change hamper the adoption of the working practices needed to support the IR (Ware, 2004).

While institutional repositories are becoming more prevalent in academic life, the disappointingly small number of materials in them reflects worldwide trends. Davis and Connolly (2007) reported that Cornell's IR is largely underpopulated and underused by its faculty as the Cornell faculty have little

knowledge of and little motivation to use the repository. Van Westrienen and Lynch's (2005) European survey also reported low faculty participation in IRs. Their article identified several reasons for non-participation from faculty, including: (a) Difficulties informing faculty and convincing them to participate; (b) Confusion and uncertainty about intellectual property issues; (c) Scholarly credit and how the material in IRs would be used; (d) The perception of Open Access content being of low quality, and (e) A lack of mandatory policies for depositing manuscripts. Correspondingly, Swan and Brown (2005) who investigated author self-archiving behavior found that there was a substantial proportion of authors unaware of the possibility of providing open access to their work. Only 30% of the 1296 respondents using specialized OAI search engines to navigate the open access repository and only 10 % of authors knew of the SHERPA/RoMEO list of publishers' permissions policy with respect to self-archiving. More people opted for putting their work on a website than have used institutional or subject-based repository. However a vast majority of authors would willingly comply

with a mandate from their employer or research funder to deposit copies of their articles in an institutional or subject-based repository. Swan and Brown (2005) found that authors' reluctance to self-archiving their work were due to the perceived time required and technical difficulties in carrying out the activity.

Although a number of studies have investigated the attitudes of authors with respect of open access publishing and institutional repositories (IRs), none have however viewed other institutional stakeholders. Academic libraries, in particular, are a group that can make a major contribution to an IR. Academic libraries are becoming so involved in managing electronic scholarly products and participating in the evolving scholarly communication process. They do not only acquire electronic resources, but also create them. Libraries 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 IRs 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 IRs 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 IRs remains unclear due to its lack of contribution by the stakeholders, what is clear is that library and information professionals have key roles to play (Chang, 2003; Allard, Mack and Feltner-Reichert, 2005; Chan, Kwok and Yip, 2005). Chang (2003) proposes that it is necessary for librarians to be conversant with digital collection management and open archive information system management skills. Library staff need to be trained to prepare documents in an acceptable format and to submit content to the repository. Allard, Mack and Feltner-Reichert (2005) found that IRs provide librarians with new challenges because self-archiving makes the authors more active partners in collection development, and because the librarian may become the steward of unique collections that grow rapidly because of author contributions. In her analysis of 30 scholarly literature on IR,

the author found that nearly one-third of the articles did not mention how a library is involved in the IR effort. Even those who did note that libraries had a role in the process did not always explicate how the library would be involved. The areas that were mentioned as involving the library included IR creation and maintenance. Chan, Kwok and Yip, (2005) on the other hand, illustrate how the roles of reference librarians are changed in the process of building the institutional repository. There are extensions of existing roles in terms of system evaluation, advocacy and reference services. Brand new roles include content recruitment and interpreting publishers' policies.

Librarians are in an ideal position to act as change agents in the promotion of their own university's IR as well as other IRs as potentially valuable sources of information for their clients. Bauer (2005) points out that marketing the IR is critical and the librarians should be the first step in promoting it on campus because without their support, it will be difficult to achieve broader acceptance on campus. One responsibility of academic library reference team is to show the academic staff and students

in their university how to find and use information. Hence, librarians are ideally placed to act as change agents promoting the IR as an information source (Revell and Dorner, 2009).

OBJECTIVES

The objective of this study is to investigate (a) the issues in establishing a facility to provide open access to research materials such as level of knowledge, participation, partnership, ownership and management; and (b) the potential of an IR and the requirements of a good digital repository in allowing faculties to cooperatively develop and upload the resources to the institutional repository. Specific research questions posed are:

a) Are faculty aware about institutional repositories?;
b) What does faculty think about making their intellectual output available through an Institutional Repository?
c) How does faculty make their research/teaching materials publicly accessible on the Internet?
d) Why are faculty members reluctant to contribute to institutional repositories?

Answering these research questions would highlight the implication on the roles of the library in the implementation of the IR.

METHODOLOGY

An e-mail invitation to participate in the survey was sent out internally to all academics (around 800 of them) within the university, which has deployed a DSpace (www.dspace.org) IR in 2008. This is termed the randomly-selected population. The e-mail, which contained a hypertext link, enables the participants to link to the survey database hosted by SurveyPro (www.surveypro.com). The survey instrument consisted of 6 sections: (a) awareness and knowledge of IR as well as current IR contribution; (b) usefulness and importance of IR; (c) self-archiving experience; (d) future IR contribution; (e) concerns for contribution; and (f) demographic. If surveyed faculty members indicate that they have awareness of the IR, plan to contribute to the IR in the future, and do other self-archiving practices, they are administered every section of the questionnaire. Otherwise, they will skip one or more sections depending on their awareness and experience of self-archiving.

Table 1. Survey Response Rate

Total sample	about 800
Clicked on survey link	178
Did not complete	47
Non-completion rate	26%
Completed survey	131
Response rate (approx)	16%

After three rounds of distribution, responses were received from 178 academics. The total number of usable, fully completed questionnaires was 131, from 17 faculties, institutes and centres at the university (Table 1), and the response rate is fairly typical of online surveys (Gravetter and Forzano 2008). By faculties, the respondent pattern is presented in Table 2. The sample is dominated by academics from the science-based faculties, which is a predictable response, given the Faculty of Science alone accounts for about 26.7% of responses. By academic position, the respondent pattern is presented in Table 3. From the 131 respondents, total of 63.4% (83) respondents reported that their discipline typically "always" uses IR; 22.1% (29) indicated "very frequently", 11.5% (15) somewhat frequently, 2.3% (3) rarely and one respondent indicated "not at all". A total of 23.7% (31) respondents reported "very

comfortable" using technology, 69.4% (91) indicated comfortable, and 6.9% (9) reported neutral / uncertain. None of the respondents indicated either uncomfortable or very uncomfortable using technology.

FINDINGS

A. IR Awareness, its Importance and Faculty Contribution

Respondents were first asked if they have ever made any of their own work publicly available (for example in a journal, on a website or in departmental publication), either at the university or elsewhere. A total of 55.7% (73) indicated Yes, and 44.3% (58) reported No. Examples of work made publicly available are such as conference papers, journal articles, lecture notes and presentation slides and these are published at the conference and journal hosting websites, as well as the faculties' websites. Two respondents indicated that they even make their

Table 2. Respondents by Faculties (n=131)

Faculty / Institute / Academy / Center	% of respondents	Number of respondents
Arts and Social Sciences	2.3	3
Business and Accountancy	5.3	7
Computer Science & Information Technology	17.5	23
Dentistry	3.1	4
Economics & Administration	3.8	5
Education	4.6	6
Engineering	8.4	11
Languages and Linguistics	3.8	5
Law	0.0	0
Medicine	11.5	15
Science	26.7	35
Built Environment	3.8	5
Islamic Studies	3.1	4
Malay Studies	1.5	2
Foundation Studies in Science	2.3	3
Cultural Centre	0.8	1
Sports Centre	1.5	2
Number of Respondents		131

Table 3. Respondents by Academic Position (n=131)

Academic Position	% of respondents	No of respondents
Professor	16.8	22
Associate Professor	18.3	24
Senior Lecturer	21.4	28
Lecturer	39.7	52
Other Academic Staff	3.8	5
Number of Respondents		131

work available at social networking sites. Out of 131 respondents, 69.5% (91) academics know what open access meant and were aware of any digital repositories and IR. Those who knew about the IR learned about it in various ways, namely from (a) working in a field with established subject based archives (93.4%, 85); (b) following the debate on open access (79.1%, 72); (c) results of a web search engine (59.3%, 54); (d) publicity on the university library web site (30.8%, 28); from fellow postgraduate students (23.1%, 21); (e) information provided at faculty or department meeting (19.8%, 18); and (f) from other academic staff (17.6%, 16). Those publishing in molecular biology, physics, mathematics, library science and computer science and were the most likely to have published their work via an open access repository, as reflected from the open-ended responses, which listed Genbank, EMBL, MiRbase, arxiv.org, and E-LIS as the avenues for archiving.

Although nearly 70% of the respondents said they knew what was meant by open access repositories, their understanding varied considerably. Responses ranged from "anyone can access electronically without having to pay subscription" to "a facility that can be accessed and utilised by anybody without restrictions", and from "free, immediate online full text access of journal articles" to "creative works and research output that can be freely accessible online which scholars and researchers give to public without expectation of payment". Most had grasped the idea that OA work was available to everyone, and most understood that it was free of cost to the user.

However, only 35.9% (47) of the total respondents were aware that the university is initiating a project to investigate the feasibility of an IR. This result indicates that although more than half of the respondents have published their materials online, only a small number knew about this initiative. In spite of the low awareness of the IR, 39 (29.8%) out of 131 respondents strongly like the idea of making their intellectual output available through the university's IR. These science-based faculty members (such as Medicine [6 out of 15 people], Engineering [9 out of 11 people], Science [17 out of 35 people] and Computer Sciences [7 out of 23 people]) were overwhelmingly in

favour of permitting the deposit of their research work through the university's IR. Interestingly, 7 out of the 39 who were motivated to contribute to the IR had no awareness of the IR, but wanted to make IR contributions in the future. Another 85 (64.9%) like the idea, and out of this figure, 53.4% had no awareness of the IR. Thus, among those respondents who liked the idea and intended to contribute to the IR, 15 were already aware of the IR and 70 were not. Of the remaining respondents, only one person (0.8%) dislike the idea and had no plans to contribute in the future and 6 (4.6%) were undecided.

The survey also solicits opinion on the usefulness and importance of an IR to the university. The five Likert-scale questions, therefore, were answered by those 91 respondents who were aware of any digital repositories and IR. The majority of those who were aware felt that an IR would be very useful for the university, and that it is critically important that the university implements an IR. In general, faculty unanimously felt that it is important for (a) the members of the university to retain those intellectual property rights needed to make their intellectual output available through an IR; and (b) the members of the university (UM) consistently make their intellectual output available through an IR. However, not everyone felt that it is important that the university considers works placed in an IR when evaluating faculty for tenure. Table 4 presents these findings.

B. Self-archiving Experience

The study is also concerned with respondents' self-archiving experience. As indicated earlier, 73 (55.7%) respondents had deposited their research/teaching materials on publicly accessible web sites as well as other open access digital repositories. All these self-archiving respondents know what open access meant, 47 (64.4%) were aware of the university's IR and the majority (65, 89.0%) planned to contribute to it. Therefore, most respondents had some IR awareness, and a majority of those who planned to contribute, already had experience with self-archiving. Findings suggest that senior lecturers were more likely to say yes to self-archiving: 75.0% (21) of them said yes compared to 45.5% (10) of Professors, 45.8% (11) of Associate Professors and 59.6% (31) of lecturers.

Table 4. Usefulness and Importance of Making the Intellectual Output available through an Institutional Repository (n=91)

	Not at all useful	Slightly useful	Somewhat useful	Very useful	Indispensably useful
How useful would an Institutional Repository be for UM?	0 (0%)	0 (0%)	4 (4.4%)	63 (69.2%)	24 (26.4%)
	Not at all important	Slightly important	Somewhat important	Very important	Critically important
How important is it that UM implements an Institutional Repository?	0 (0%)	0 (0%)	1 (1.1%)	28 (30.8%)	62 (68.1%)
How important is it that members of the university (UM) retain those intellectual property rights needed to make their intellectual output (papers, data, etc.) available through an Institutional Repository?	0 (0%)	0 (0%)	5 (5.5%)	72 (79.1%)	14 (15.4%)
How important is it that members of the university (UM) consistently make their intellectual output available through an Institutional Repository?	0 (0%)	0 (0%)	4 (4.4%)	76 (83.5%)	11 (12.1%)
How important is it that the university considers works placed in an Institutional Repository when evaluating faculty for tenure?	2 (2.2%)	7 (7.7%)	26 (28.6%)	56 (61.5%)	0 (0%)

Out of the 73 respondents who had self-archiving experience, 3 (4.1%) had self-archived their work for more than 5 years, 9 (12.3%) had done so for 3-5 years and an additional 14 (18.2%) had 1-3 years experience. The majority (47, 64.4) had deposited their work in publicly accessible web sites for the past one year. When asked about the frequency of contribution to IRs in an open-ended question, one respondent reported the frequency of contribution to the web site of his faculty saying, "I have been contributing through my faculty's web site for years." Nine respondents who were aware of the

university's IR, planned to contribute in the future, and already had self-archiving experience in other open access venues such as arxiv.org, E-LIS and MyAIS (myais.fsktm.um.edu.my), the open access system for Malaysian scholarly publications. One professor indicated depositing various versions of his scholarly articles to a particular open access repository "whenever the papers have been submitted for review and have been revised".

In the survey, data regarding what types of work that faculty would like to use for self-archiving and which file formats would they generally use and therefore would like to deposit were ascertained. As producers of information, faculty would like to deposit refereed and published articles in the form of research reports and conference papers, as well as co-authored works (Table 5). Conference presentations were also found to be the most frequently self-archived materials. Complete or parts of theses were acceptable to be deposited in the IR. Respondents would also like to make departmental papers and book chapters publicly accessible. However, respondents were less likely to self-archive pre-refereed articles

than they were to self-archive refereed published articles. Other types of research/teaching materials some would like to deposit are unrefereed articles (technical reports or working papers) and data sets. This result indicates that there are various types of resources that respondents would employ for self-archiving; they may not only deposit published articles, but also other types of research work.

In addition, Table 5 also presents the resources that faculty would wish to find in an IR. In sum, the respondents who had self-archiving experience would most likely use post-prints, conference papers and presentations, as well as seminar and technical papers more frequently than theses and pre-prints. In addition to research articles, the respondents also would wish to find teaching materials and resources such as software, video and sound files, training manual, book chapters and data sets.

Replicating Pickton's (2005) question on responsibilty for task involved in depositing work in an IR, respondents were presented with a list of ten tasks and they were asked to indicate whether each task should be the author's responsibility or of the repository

Table 5. Types of self-archived materials that Faculty would like to deposit and find (n=73)

Materials	Would like to deposit Percentage (Frequency)	Materials	Would wish to find Percentage (Frequency)
Thesis (complete)	61.6% (45)	Theses (complete)	64.4% (47)
Thesis (part) – Literature review	63.0% (46)	Theses (part)	61.6% (45)
Thesis (part) – Methodology	60.3% (44)	Research reports	94.5% (69)
Thesis (part) – Results	61.6% (45)	Preprints (research article before peer review)	30.1% (22)
Thesis (part) – Discussion	63.0% (46)	Postprints (peer-reviewed research paper)	98.6% (72)
Thesis (part) – Data sets	24.7% (18)	Conference papers	100% (73)
Research report	98.6% (72)	Presentations	69.9% (51)
Co-authored work	97.3% (71)	Departmental papers (e.g. seminar papers)	80.8% (59)
Preprint (research article before peer review)	20.5% (15)	Technical reports	80.8% (59)
Postprint (peer-reviewed research paper)	30.1% (22)	Working papers	64.4% (47)
Conference paper	98.6%(72)	Discussion papers	80.8% (59)
Presentation	61.6% (45)	Teaching materials	53.4% (39)
Departmental paper (e.g seminar paper)	63.0% (46)	Data sets	15.1% (11)
Book	60.3% (44)	Software	26.0% (19)
Dataset	21.9% (16)	Books	63.0% (46)
Others:	-	Others: Training manuals	38.4% (28)
		Others: Video files	38.4% (28)
		Others: Sound files	37.0% (27)

administrators. The results are shown in Table 6. The figures show a clear consensus over some of the tasks. The respondents unanimously agreed that it was their responsibility to provide an abstract of their work, and most (94.5%, 69) felt that they should also be responsible for taking the decision to delete work. The other tasks for which faculty largely felt responsible were providing key words (72.6%, 53) and entering appropriate descriptive information (69.9%, 51). Perhaps, the remaining respondents were concerned over the standardisation of bibliographic information or metadata and felt that the repository administrator might be in a better position to achieve this. A total of 69 respondents (94.5%) said that the repository administrators should be responsible for migrating files ('converting files to the latest version of hardware or software'); 43 (58.9%) agreed that the administrators should confirm intellectual property rights and actually put the work onto the repository (57, 78.1%); 56 (76.7%) said they should be responsible for deleting material. The findings seem to suggest that the faculty generally felt that the 'back end' tasks should be the responsibility of the administrators.

C. Faculty's Concerns About Self-archiving

What make faculty reluctant to contribute to IRs? In order to investigate this research question, the same 65 respondents motivated to contribute to the IR in the future had to respond to the 28 statements regarding their concerns about self-archiving. The same procedure of selection and sorting, coding and ordering was undertaken for these statements offering two options agree and disagree.

Overall, many faculty members disagreed with the statements presented as "deterrents of self-archiving" (Pickton, 2005). The top three deterrents for more than 70% respondents include: "I am concerned about other publishers owning the copyright of previously published material" (75.4%), "I am concerned about plagiarism" and "I am concerned that others might copy my work without my permission" (73.8% respectively). As such, concerns about copyrights and plagiarism might impede self-archiving.

In addition, more than half of the respondents disagreed with the following statements reflecting pre-print culture, publishers' policy, trust of

Table 6. Responsibility for tasks involved in depositing work in the IR (n=73)

	The Author Percentage (Frequency)	Repository Administrators Percentage (Frequency)
Converting source material to appropriate format for deposit	32.9% (24)	67.1% (49)
Providing key words	72.6% (53)	27.4% (20)
Providing an abstract (or descriptive summary of content)	100% (73)	0% (0)
Providing web links to associated material (e.g. referenced articles, data sets etc)	28.8% (21)	71.2% (52)
Putting the work onto the repository	21.9% (16)	78.1% (57)
Entering appropriate descriptive information (author, title, date, key words, abstract)	69.9% (51)	30.1% (22)
Confirming intellectual property rights	41.1% (30)	58.9% (43)
Converting files to the latest version of software after the work has been deposited	5.5% (4)	94.5% (69)
Decision to delete work	94.5% (69)	5.5% (4)
Deleting work	23.3% (17)	76.7% (56)

readers and preservation as the reasons for not contributing to IR:

a) I do not want to put my work with work that has not been peer-reviewed (55.4%; 36)

b) I might want to change or delete my work (66.2%; 43)

c) I am concerned that if I deposit my work in the University's Repository I may not be able to publish it elsewhere later (55.4%; 36)

d) I am concerned about the effect of open access repositories on journal publishers (67.7%; 44)

e) I am concerned that others might alter my work without my permission (67.7%; 44)

f) I am concerned about the long term feasibility of the repository (66.2%; 43)

g) I am concerned that my work might not be preserved in the long term (63.1%; 41)

This result suggests that the respondents might be more concerned or skeptical about the quality and secure maintenance of open access materials. As such, IRs

might have to emphasize their function of facilitating the pre-print culture and of long-term preservation and explain how these would be accomplished.

D. Decision to Self-archive

How would the 131 faculty respondents respond to a requirement from the university or research funder to make their work open access by self-archiving in the university's IR? A total of 52.7% (69) respondents would comply willingly, 47.3% (62) would comply reluctantly. None would not comply. The finding clearly indicated that a mandate from an institutional employer or a research funder to self-archive would meet with very little resentment and even less resistance from the respondents.The results corroborate with the earlier finding that shows the influence of research funders as one of the reasons for IR contribution.

Although this study did not determine the university's or grant funders' attitude toward self-archiving, the lack of motivation for IR contribution might be led by grant funders that showed no interest in or ignorance of self-archiving. Since 43.5% (57) of the overall respondents acknowledged grant awarding body as a contextual factor for IR contribution, this result seemed to indicate that grant funders' influence would contribute to having faculty with strong belief in positive outcomes from self-archiving. This result also suggested that those with no intention or was uncertain about future IR contribution tended to perceive more influence of grant-awarding bodies on their decision to self-archive. This study supports those by Kim (2007) and Swan and Brown (2005) who opined that if grant funders encourage self-archiving, authors or researchers would consider depositing their work into IRs. If not, they would have lack of motivation to contribute to the IR.

DISCUSSION : IMPLICATION ON LIBRARIANS' ROLES

Although IRs are gaining in momentum throughout academia, the faculty in this study seems to be cautious regarding IR contribution. The concerns relating to IR among the faculties reflect to some degree the way in which repositories have developed in Malaysia, where for the most part IRs have been introduced for the worthy purpose of giving researchers a vehicle to enhance the availability of their publications by making them available via open access.

a. Understanding the Software used: Although IR technology was not a strong focus in the IR literature (Allard, Mack and Feltner-Reichert 2005), it is very important that librarians have a full working knowledge of the software features. Tasks such as a database evaluation, by comparing and contrasting the IR systems available based on criteria such as database structure, interface, search capabilities, special features, software requirements, speed and reliability, and export options need to be done before the final selection of the software.

b. Publicity and Advocacy of IR
The success of open access archiving in expanding access to scholarly works depends significantly on the author's knowledge of open access, and the ready availability and accessibility of archives to authors. As Papin-Ramcharan and Dawe (2006) plainly put it "If authors are unaware of the existence and benefits of archives then they cannot self–archive." The faculties in this study are poorly-informed on institutional repositories. Almost two-third does not know if their institution has one. This low level of awareness may results from one current strategy used by the university library to populate its repository in which librarians collect and deposit materials on behalf of faculty members. The deposited items are generally post-prints, such as conference papers and journal articles. Therefore, faculty members may not realize that their materials are already in the library's repository. The other reason is that the IR of the university has just been deployed and has not been widely publicized. As such, the librarians need to approach the faculty in a number of ways: on a one-to-one basis through informal conversations, small group discussions, departmental or faculty visits through the liaison librarians, and campus-wide promotion.

c. Establishing an Institutional mandate
All faculty respondents in this

survey would comply with the university or research funder that required them to deposit copies of their scholarly work in the university's repository. As institutional repositories exist to serve the institution and funding bodies, rather than the individual, several institutions around the world have implemented such a mandate as recorded in the Registry of Open Access Repository Material Archiving Policies (ROARMAP). An institutional mandate might be successful in producing Open Access for the research intensive university in this study. There have been evidences demonstrating that institutions that have a mandatory policy have high proportion of published articles self-archived (Sale 2006), compared to those that have only voluntary policies (Suber 2006). The library need to discuss with the university's top management regarding mandating submissions in the IR and establish the self-archiving policies.

d. Educating Faculty Regarding Self-archiving Issues

The commonly expressed concerns regarding self-archiving are copyright and plagiarism. Considerable work has been done on copyright in association with the use of repositories to enhance the open access for research outputs, especially published articles. Librarians need to seize every opportunity to inform the faculty members of the open access movement, the trends of open access publishing, and increasing governmental and organizational support for IRs. Faculties need to be informed that over 90% of journals explicitly permit authors to self-archive their articles (Swan and Brown 2005), in most cases as postprints (after peer review, in the form of the author's final submitted manuscript). Educating the faculty regarding self-archiving issues need to be undertaken to highlight the motivations for using the IR and reassure faculty who may be worried about the deterrents. As such, to facilitate faculty to make an informed decision to deposit their work, the university's IR would provide FAQs covering

the following areas: ownership of copyright, protection of rights using Creative Commons license, plagiarism and file security. The IR would also need provide a link to the SHERPA/RoMEO list of journals' publishers' self-archiving policies (http://romeo.eprints.org).

e. Submission Review for Content and Metadata
When faculty self-archive, they will also be submitting metadata. In an IR environment, librarians have to be responsible to determine the acceptable resources, metadata standards, review the content as well as the quality of metadata described by the authors.

f. Training of Authors
Authors are a very important aspect of the IR. Librarians must actively pursue their role as educators to work with authors of intellectual works who will be contributing to the IR. This is a natural extension of the user training that librarians have provided for decades. Education would include helping the university community learn to use IR software for self-archiving. In addition, the training should include topics related to creating documents that can be more easily maintained in a digital environment, to issues surrounding digital preservation and to providing guidance concerning metadata.

Populating the university's IR through self-archiving has been a painfully slow and uphill process, similar to the process described in Chan, Kwok and Yip (2005). Faculty members through official letters signed by the Vice-Chancellor are invited to submit to the IR. The response was not encouraging; only twelve submissions were received in the first three months after the IR was implemented at the faculty level in June 2008. The total number of direct submissions reached 64 by the end of 2008, by no means an encouraging figure. The author has reasons to believe that the academics have busy schedules, and will consider self-archiving extra administrative work, however many of them understand and support the idea of open access and IRs. Therefore more aggressive strategies were adopted to populate the IR when faculty made it mandatory for students to submit

an electronic copy of their theses and dissertations, and the Digital Library Research Group initiated the submission of these resources in the IR.

CONCLUSION

The study, based on a small set of survey data, has presented findings on faculty awareness and their use of open access repositories, the advocacy undertaken, and reasons that may influence faculty's motivation for IR contribution, which will lead to the actual deposit into the IR. Findings suggest that over one third of the faculty respondents are unaware of open access and IR, or are aware of its existence but remain detached from it. However, faculty's attitudes to the open access movement and IRs are generally positive – the majority acknowledge the importance of an IR and like the idea of making their intellectual output available through the university's IR. Faculty who have had experience in self-archiving want open access at both ends of the chain: as authors and as readers. The concerns faculty has regarding IR contribution implicates that librarians have an important role to play with regard to the relationship with self-archiving authors. The paper has identified the following roles that are of the responsibilities of librarians in an IR environment: (a) Understanding the IR software used; (b) Publicity and advocacy; (c) Establishing an institutional mandate; (d) Educating faculty regarding self-archiving issues; (e) Submission review for content and metadata; and (f) Training of authors.

Based on methodical IR development informed by best practices in the Open Access community, as well as findings from this study have been used for repository design customizations and functionality enhancements that complement the needs, interests and concerns of the faculty. The IR development has been aimed at achieving near-term goals for building content and services in close consultation with faculty. The testbed is a collection of theses, dissertations, and articles by the Faculty of Computer Science & Information Technology community. Preliminary findings has shown that an IR, is an extremely worthwhile endeavour, and is a viable proposition for the University's support for a new pattern for scholarly communication, apart from surfacing its scholarly works and low cost interoperability among various faculties' web portals.

It is hoped that this IR will increase the accessibility of scholarly works, which exist in digital format and make the university's contributions to world literature more visible. However, as evidenced by other studies (Davis and Conollay, 2007) and verified again by this initiative, faculty output is not finding its way into the university's IR in large numbers (see http://dspace.fsktm.um.edu.my).The prevalence of peer-reviewed work nationwide and the well-documented difficulty of recruiting works of any type are not currently facilitating significant inroads in the open access movement. However, at this stage, the success of the institution in implementing an IR, as gauged by the criteria in this study, should provide hope to later entrants into the community and should influence the way we evaluate the potential of these repositories in Malaysia.

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