Malaysian authors’ acceptance to self-archive in institutional repositories
Towards a unified view

Feria Wirba Singeh
Department of Library and Information Science, University of Malaya, Kuala Lumpur, Malaysia

A. Abrizah
Department of Information Science, University of Malaya, Kuala Lumpur, Malaysia, and

Noor Harun Abdul Karim
Department of Library and Information Science, University of Malaya, Kuala Lumpur, Malaysia

Abstract
Purpose – The aim of this paper is to evaluate Malaysian authors’ readiness to self-archive in open access repositories. The effectiveness of open access repositories to support knowledge-sharing is expected to be highly dependent on the readiness of authors to self-archive their research output.

Design/methodology/approach – 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 authors within the five research-intensive universities in Malaysia. An e-mail invitation was sent out to 1,000 authors within the five intensive universities, of which 108 responded. This study uses the unified theory of acceptance and use of technology (UTAUT) model, which postulates the constructs of performance expectancy, effort expectancy, social influence and facilitating conditions on using technology. These constructs determine the behavioral intent, which influences the usage behavior of this technology.

Findings – The findings from this study revealed that performance expectancy, effort expectancy, social influence and facilitating condition did not influence authors’ behavioral intention to self-archive. Even though academic researchers tend to agree that institutional repositories are a good way of disseminating information and use them frequently, most of them have not fully embraced self-archiving in institutional repositories.

Originality/value – This is the first attempt to utilize the UTAUT model to assess self-archiving practices, and it shows that self-archiving does not prove strong support for the model.

Keywords Institutional repositories, Digital repositories, Green route to open access, Academic authors, Open access publishing, Malaysia, Open access, Knowledge sharing

Paper type Research paper

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Introduction
In the last decade, academic libraries have seen a great need to integrate information technology and education. Many college and university libraries have invested heavily to subscribe to online databases in order to gain access to valid information that students can use for research. This has brought about a need for greater improvements in the way information is stored, disseminated and accessed. The advancement of open access web technologies has also made this a lot easier. Swan (2006) points out that open access repositories make possible the free online availability of the research results that scholars give away (peer-reviewed journal articles and conference papers), provided by authors upon acceptance for publication and made permanently available without restrictions on use.

Academic libraries have been seen as an ideal location for digital repositories, and many of them are still planning on implementing institutional repositories, whereas some have implemented them but are looking for better ways of promoting and encouraging academic authors to self-archive articles into these repositories. Institutional repositories, a “set of services that a university offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members” (Lynch, 2003), have made it possible for academic libraries to preserve, manage and disseminate the knowledge generated within the institution. Mark and Shearer (2006) view institutional repositories as “a way that institutions can ‘get back’ some of the output from the researchers and accelerate the movement toward open sharing of knowledge”. Institutional repositories offer a number of advantages, including:

- increasing visibility;
- preservation of the institution’s research output; and
- the provision of broad, free access to published research emanating from the university (Grundmann, 2009).

The capture and preservation of a university’s intellectual output eventually contributes to an institution’s visibility (Harnad, 2003) and will also bring about prestige and public value (Crow, 2002). Institutional repositories have also brought about an increase in the profiles of authors, especially as research papers that are freely available online are easily downloaded, and are cited earlier and more often than those that are not. They enable the security and long-term availability of institutional research results and also enhance interoperability between university systems, making knowledge sharing easy. Zainab (2006) sees open access archives as a necessary tool to disseminate and enhance awareness among researchers of the availability of research-based literature. Foster and Gibbons (2005) also stated that institutional repositories not only increased research impact, but that adoption by faculty was aimed at enabling other scholars to find, use, and cite their work. This is a possibility, according to Tonta (2008), because articles are made available to all, free of charge.

The trend in institutional repository deployment is quite new in Malaysia. Abrizah (2009) wrote that few Malaysian research universities were implementing institutional repositories to enhance their visibility. Zainab (2006) reported that the open access movement in Malaysia had a direct impact on the development of institutional repository services and in addition on encouraging academics to submit their intellectual works to institutional repositories. This would eventually boost the
visibility of academics and enhance collaboration between scholars. Consequently, it is indubitable that there is a disparity in academics’ attitudes towards open access and institutional repositories. Since authors are an important factor where the success of an institutional repository is concerned, there is a need to explore the effectiveness of repositories and on authors’ readiness to self archive into these repositories. The results of understanding authors’ perceptions towards self-archiving and institutional repositories will help academic institutions and repository administrators to bring about improved investment decisions, it will direct them on how to promote and encourage self-archiving and the use of institutional repositories and it will direct them to know if institutional repositories are an efficient means of disseminating information within their institutions.

This paper focuses on Malaysian authors’ acceptance to self-archive in open access repositories by applying the unified theory of acceptance and use of technology (UTAUT) model. Acceptance is seen as the researcher’s readiness and awareness of those particular issues relating to self-archiving and those managed activities that address open access as well as the behavioral intention and plan to self-archive in an institutional repository; researcher’s level of awareness, current practices, behavioral intention and barriers to self-archiving will determine their level of readiness towards self-archiving. Venkatesh et al. (2003) proposed UTAUT as an acceptance model after a comprehensive assessment of eight prominent models used in user acceptance of technology:

1. the technology acceptance model (TAM);
2. the theory of reasoned action (TRA);
3. the theory of planned behavior (TPB);
4. a model combining TAM and TPB (C-TAM-TPB);
5. the motivational model (MM);
6. the model of PC utilization (MPCU);
7. social cognitive theory (SCT); and
8. the diffusion of innovation theory (DOI).

The UTAUT model identifies performance expectancy (PE), effort expectancy (EE), social influence (SI) and facilitating conditions (FC) as direct determinants of behavioral intention and use behavior.

The constructs in the UTAUT model have been used in many studies, especially in research on acceptance and intention to use information systems. This theory has also been adopted by various studies in library and information science. For example, Tibenderana et al. (2010), in their study “Measuring levels of end-users’ acceptance and use of hybrid library services”, opined that “relevance” and “social influence” have significant effects on intentions to use electronic library services as well as social demands. Relevance of available services, facilitating conditions and expected benefits from using e-services are some of the reasons why university communities in Uganda are tending to use electronic library services. Hedland (2008) used the UTAUT model in his study on researchers’ attitudes towards Open Access and institutional repositories as an explanatory model for developing a survey form for a quantitative empirical research on user attitudes and preferences. The constructs are used to study
acceptance and use and eventually non-use of open access publishing. Mann et al. (2008) also used the UTAUT theory in their study on open access publishing among scientists. While focusing on performance, respondents chose open access over traditional publication media, citing that open access’s wide and rapid dissemination of knowledge and a broad readership was more beneficial. The study found a need for performance and peer issues to be addressed first as far as promoting open access is concerned before attitude towards open access, because scientists’ attitude towards open access publishing is quite positive. As such, this model is considered to be suitable for this study since its constructs may have a direct effect on authors’ behavioral intentions and usage of open access repositories.

Literature review
There are still a substantial proportion of authors unaware of the possibility of providing open access to their work by self-archiving. This has been evidenced in several studies:

- Swan (2004) and Swan and Brown (2005) who found that many academic authors are not familiar with the concept of any institutional repositories. Some were hesitant to make it self-archiving a priority, and some had heard of it and remained largely ignorant of its implications. Swan (2006) reported that over one third of researchers were not aware of the possibility of self-archiving their work.
- A large author survey in the USA demonstrated a generally low level of awareness of institutional repositories. Many authors are unwilling to place their articles in repositories. Researchers rated knowledge of institutional repositories at a much lower level than knowledge of open access journals.
- A European survey also reported low faculty participation in institutional repositories. Researchers mainly preferred to submit manuscripts to faculty pages or research group websites.
- Research also reported that faculty members at Cornell University were not contributing to the institutional repository, as it remained under-populated and under-used. This is because faculty members had little knowledge and motivation to use the institutional repository.
- Abrizah (2009) found that only 69 percent of faculty members in a research-intensive university in Malaysia knew what open access meant and were aware of digital and institutional repositories.

Previous literature (Lynch, 2003) has focused on the need to convince academic staff to submit their research to ensure the success of the institutional repository and the methods for convincing them to do so. In New Zealand, research examined the factors that influence academics’ decisions to contribute to and use institutional repositories. Surveys have shown several reasons for faculty’s reluctance to deposit their work in repositories. Harnad (2006) provides a comprehensive list of faculty concerns about self-archiving, one of which is a misunderstanding as to what self-archiving is all about. Some of these concerns result from misconceptions and a lack of understanding of what open access and institutional repositories actually mean, but other concerns point out areas that need to be addressed.
Copyright and intellectual property issues are also of concern to researchers. There is a mistaken belief that self-archiving violates copyright agreements (Harnad, 2006). Authors are concerned that they may be violating the copyright agreements they have signed with their publishers by depositing their papers into an institutional repository. Researchers tend to be uninformed about copyright issues, though most publishers allow authors to make their articles accessible via their university’s institutional repository. A study on open access initiatives in academic libraries, reported that of ten respondents who had deposited materials in an institutional repository, only one was confident about the copyright issues when submitting his previously published journal article to the library’s institutional repository. The other nine were reported to “have a slight idea”. Confusion over what is permissible according to publisher agreements leads to a tendency to be over-cautious (Sale, 2006).

A further major impediment to self-archiving is seen from the viewpoint of time consumption; some researchers consider the entering of extra bibliographic data to be rather arduous and complicated. Cornell University researchers surveyed described the learning curve associated with the institutional repository as a deterrent. Though, Carr and Harnad (2005) show that the process is much less time-consuming than researchers fear, since their findings show that a paper could be self-archived within ten minutes. Earlier investigation revealed that only three institutional repositories provided step-by-step instructions on how to submit materials to the institutional repository, including what type of materials and who may submit. On the other hand, it has been noted that there are other issues involved in the amount of time and difficulty it takes to self-archive publications, including investigating publisher permissions, digitizing paper documents, and ensuring privacy for certain kinds of research data. Time to them is a factor, and the process is time-consuming. It was reported that respondents in their study complained of time consumption; even those who were not initially aware of the service said they would do so if the task of uploading could be handled by the system administrator. The respondents were not eager to contribute if they had to do it themselves, even when some of them agreed that it would be very beneficial to do so. Some were of the opinion that they would get their research assistant to archive their work.

Another barrier or obstacle is getting the necessary finances to develop an institutional repository. Financial resources were seen to be a major impediment to wider access to published scholarly information in developing countries. It was noted that institutional repositories are not a cheap investment, especially those with strong preservation and attractive services. Some reports have provided estimates of expenses for individual repositories. For example, it was estimated that the DSpace repository at MIT costs about $285,000 per year covering personnel and systems.

Concern has also been raised over the quality of materials housed in a repository. There is a perception that repository content is not peer-reviewed and that repositories conflict with the prestige factor of publishing in respected journals for promotion and tenure decisions (Harnad, 2006). Researchers are still free to publish in prestigious journals in their field and benefit from the peer-review services provided by the publisher. In fact, institutional repositories simply broaden access.

**Objective and method**
The objective of this study is to evaluate Malaysian authors’ acceptance of open access repositories as a means to forecast, explain and improve usage patterns. This study
adopted a quantitative research design, and a web-based survey method was used for data gathering. The subjects of the study were authors within five research-intensive universities in Malaysia (Table I). An e-mail invitation was sent out to 1,000 authors within these five universities. This is termed a randomly selected population. The e-mail, with a brief introduction about the survey, contained a hypertext link that enabled the participants to link to the survey database hosted by eSurveysPro (see http://esurveyspro.com). After three rounds of distribution, responses were received from 108 researchers. As such, 108 researchers took part in the online author survey, of which 72 participants completed the entire survey. A total number of 47 (65.3 percent) of these respondents were reported to have said “yes” to self-archiving practice, whereas 25 (24.7 percent) were reported as saying “no” to self-archiving practice.

The study also examines the applicability of UTAUT to open access publishing as a new innovation to disseminate information on institutions’ research output. From the UTAUT model, it is known that authors’ acceptance of open access repositories depends on performance expectancy (PE), effort expectancy (EE), social influence (SI) and facilitating conditions (FC). With these constructs, the research objective lead to the following research questions:

- **RQ1.** How is performance expectancy related to authors’ acceptance to self-archive in open access repositories to support the dissemination of research output?
- **RQ2.** How is effort expectancy related to authors’ acceptance to self-archive in open access repositories to support the dissemination of research output?
- **RQ3.** How is social influence related to authors’ acceptance to self-archive in open access repositories to support the dissemination of research output?
- **RQ4.** How are the facilitating conditions related to authors’ acceptance to self-archive in open access repositories to support the dissemination of research output?

<table>
<thead>
<tr>
<th>University</th>
<th>Institutional repository</th>
<th>URL</th>
<th>Birth date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Universiti Kebangsaan Malaysia (UKM)</td>
<td>PTSL UKM Repository</td>
<td><a href="http://eprints.ukm.my/">http://eprints.ukm.my/</a></td>
<td>29 August 2007</td>
</tr>
<tr>
<td>Universiti Putra Malaysia (UPM)</td>
<td>Universiti Putra Malaysia Institutional Repository (PSAS IR)</td>
<td><a href="http://psasir.upm.edu.my/">http://psasir.upm.edu.my/</a></td>
<td>23 April 2008</td>
</tr>
<tr>
<td>Universiti Sains Malaysia (USM)</td>
<td>ePrints@USM</td>
<td><a href="http://eprints.usm.my/">http://eprints.usm.my/</a></td>
<td>17 April 2008</td>
</tr>
<tr>
<td>Universiti Teknologi Malaysia (UTM)</td>
<td>UTM Institutional Repository</td>
<td><a href="http://eprints.utm.my/">http://eprints.utm.my/</a></td>
<td>11 March 2009</td>
</tr>
</tbody>
</table>

**Note:** “Birth date” is either when the repository was first registered in the Registry of Open Access Repositories (ROAR) or the earliest record found via the OAI-PMH interface.
Five hypotheses have been formulated with regards to research question two. The formulated hypotheses postulate that:

\( H1. \) There is a statistically significant positive correlation between PE and the behavioral intention of Malaysian researchers to self-archive in their institutional repository.

PE in this study is defined as the degree to which the author expects gains with self-archiving in research performance, thus, increasing his/her personal merits.

\( H2. \) There is a statistically significant positive correlation between EE and the behavioral intention of Malaysian researchers to self-archive in their institutional repository.

EE in this study refers to the degree to which the author expects ease of use of an institutional repository and dissemination of the research output through an institutional repository.

\( H3. \) There is a statistically significant positive correlation between SI and the behavioral intention of Malaysian researchers to self-archive in their institutional repository.

SI refers to degree to which author is influenced by peers or fellow researchers and the university to self-archive, as well as the degree to which an author may influence his/her peers to self-archive.

\( H4. \) There is a statistically significant positive correlation between FC and the behavioral intention of Malaysian researchers to self-archive in their institutional repository.

FC refers to the degree to which technical infrastructure is provided to support self-archiving and institutional repository usage, which leads to information and system quality.

\( H5. \) There is a statistically significant positive correlation between behavioral intention and the current self-archiving practices (use behavior) of Malaysian researchers to self-archive in their institutional repository.

The UTAUT model sees “behavioral intention” as “the person’s subjective probability that he or she will perform the behaviour in question” (Venkatesh et al., 2003). The measurement of behavioral intention includes the intention, prediction and planned use of open access repositories.

The validity, reliability and depth of the UTAUT model are a great determinant in why the model has been implemented in studying researchers’ acceptance of self-archiving in open access repositories. The research uses this model to generate information about the importance of the institutional repository as an information source in order to assist researchers in their usage of this research infrastructure.

Because of the alteration of the questions on UTAUT constructs as compared to the original test questions of the model, it was necessary to confirm the reliability of the scale constructs. Reliability in the technology acceptance model refers to the degree that the variables are stable and consistent with what they are intended to measure (Singleton and Straits, 2004; Moran, 2006). The reliability of the scale constructs were
tested using Cronbach’s α coefficient to measure the internal consistency and reliability of the variables in question (Table II). The five constructs of the amended UTAUT model reported a reliability of 0.864 of the Cronbach’s α coefficient (above 0.70 being acceptable). Though the reliability of social influence is questionable since it had a value of Cronbach’s coefficient of 0.659, which less than 0.70, it was still considered adequate for this analysis since it is close 0.70.

**Findings**

The general demographics of the 108 participants according to gender and academic position are presented in Table III. We asked authors whether they have used digital repositories before. As shown in Table IV, 85.2 percent (92) of them reported having used digital repositories; however, only 63.9 percent (69) of them had self archiving experience. Those who answered ‘Yes’ to self archiving were allowed to answer the questions that follow, whereas those who said no were directed to the last question of the questionnaire which required them to identify the barriers to self archiving. The average experience the participants had in self-archiving is between 3-4 years while the majority of the participants have the frequency of self-archiving more than three times per year.

The succeeding sub-sections present a detailed descriptive analysis that is aimed at providing a richer meaning of authors’ acceptance of self-archiving.

**Performance expectancy**

Table V summarizes the frequencies and corresponding percentages for the authors’ perceptions on performance expectancy. The findings suggest that a large majority of authors agree that there are gains from self-archiving in research performance, thus increasing their personal merits. In general they find that self-archiving makes their

<table>
<thead>
<tr>
<th>UTAUT constructs</th>
<th>Cronbach’s α coefficient</th>
<th>Number of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance expectancy</td>
<td>0.705</td>
<td>6</td>
</tr>
<tr>
<td>Effort expectancy</td>
<td>0.727</td>
<td>5</td>
</tr>
<tr>
<td>Social influence</td>
<td>0.659</td>
<td>5</td>
</tr>
<tr>
<td>Facilitating conditions</td>
<td>0.809</td>
<td>7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>53</td>
<td>49.1</td>
</tr>
<tr>
<td>Male</td>
<td>55</td>
<td>50.9</td>
</tr>
<tr>
<td>Total</td>
<td>108</td>
<td>100</td>
</tr>
<tr>
<td>Designation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professor</td>
<td>14</td>
<td>13.0</td>
</tr>
<tr>
<td>Associate Professor</td>
<td>23</td>
<td>21.3</td>
</tr>
<tr>
<td>Senior Lecturer</td>
<td>36</td>
<td>33.3</td>
</tr>
<tr>
<td>Lecturer</td>
<td>20</td>
<td>18.5</td>
</tr>
<tr>
<td>Tutor</td>
<td>15</td>
<td>13.9</td>
</tr>
<tr>
<td>Total</td>
<td>108</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table II. Reliability of the UTAUT model constructs in this study

Table III. Demographic information

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195
<table>
<thead>
<tr>
<th>Item statement</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Slightly agree</th>
<th>Agree</th>
<th>Strongly agree</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>I find self-archiving useful to disseminate my research output</td>
<td>0 (0)</td>
<td>8 (17.0)</td>
<td>2 (4.3)</td>
<td>20</td>
<td>17 (36.2)</td>
<td>5.98</td>
<td>1.053</td>
</tr>
<tr>
<td>Self-archiving makes my work more visible to the society</td>
<td>0 (0)</td>
<td>6 (12.8)</td>
<td>3 (6.4)</td>
<td>21</td>
<td>17 (36.2)</td>
<td>6.04</td>
<td>0.977</td>
</tr>
<tr>
<td>Self-archiving will increase my profile, bring about more recognition for me</td>
<td>0 (0)</td>
<td>6 (12.8)</td>
<td>4 (8.5)</td>
<td>22</td>
<td>15 (31.9)</td>
<td>5.98</td>
<td>0.967</td>
</tr>
<tr>
<td>Self-archiving makes it easier for me to connect with other researchers worldwide</td>
<td>0 (0)</td>
<td>6 (12.8)</td>
<td>5 (10.6)</td>
<td>24</td>
<td>12 (25.5)</td>
<td>5.89</td>
<td>0.938</td>
</tr>
<tr>
<td>Self-archiving will bring about prestige to myself and my institution</td>
<td>1 (2.1)</td>
<td>8 (17.0)</td>
<td>5 (10.6)</td>
<td>19</td>
<td>14 (29.8)</td>
<td>5.77</td>
<td>1.183</td>
</tr>
<tr>
<td>Self-archiving is a very cheap means to make my work available the world</td>
<td>0 (0)</td>
<td>7 (14.9)</td>
<td>4 (8.5)</td>
<td>21</td>
<td>15 (31.9)</td>
<td>5.94</td>
<td>1.009</td>
</tr>
</tbody>
</table>

Table V.
Descriptive statistics for performance expectancy ($n = 47$)

Note: “Disagree” refers to “strongly disagree”, “disagree” and “slightly disagree”. Figures in parentheses are percentages
research work more visible (mean = 6.04) and useful to disseminate their research output (mean = 5.98), as well as increasing their reputation as scholars (mean = 5.98).

**Effort expectancy**
Table VI summarizes the frequencies and corresponding percentages for the authors’ perceptions on effort expectancy. It suggests that the authors in general agree that learning to self-archive is an easy task (mean = 5.51), and that the features of their institutional repositories are user-friendly (mean = 5.34). However, authors slightly agree that self-archiving is not time-consuming (mean = 4.87), reflecting that they find submission to repositories takes quite some time to be completed.

**Social influence**
Table VII summarizes the frequencies and corresponding percentages for the authors’ perceptions on social influence. It suggests that the authors tend to agree that they want to self-archive because the institution think they should self archive (mean = 5.09), and that they agree that academicians who support self-archiving have more prestige than those who do not (mean = 5.02). At least two respondents in particular disagree to most of the item statements related to social influence, reflecting their opinion that authors are not influenced by peers or fellow researchers and the universities to self-archive; also, authors do not influence their peers to self-archive.

**Facilitating conditions**
Table VIII summarizes the frequencies and corresponding percentages for the authors’ perceptions on facilitating conditions. It suggests that authors in general slightly agree that technical infrastructure is provided to support self-archiving and institutional repository usage, which leads to information and system quality. One respondent in particular strongly disagreed to most of the item statements related to facilitating conditions.

<table>
<thead>
<tr>
<th>Item statement</th>
<th>Disagree*</th>
<th>Neutral</th>
<th>Slightly agree</th>
<th>Agree</th>
<th>Strongly agree</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>The features of the repository are user-friendly</td>
<td>1 (2.1)</td>
<td>14 (29.8)</td>
<td>7 (14.9)</td>
<td>18 (38.3)</td>
<td>7 (14.9)</td>
<td>5.34</td>
<td>1.128</td>
</tr>
<tr>
<td>Learning to self-archive is quite an easy task for me</td>
<td>2 (4.3)</td>
<td>9 (19.1)</td>
<td>7 (14.9)</td>
<td>21 (44.7)</td>
<td>8 (17.0)</td>
<td>5.51</td>
<td>1.120</td>
</tr>
<tr>
<td>I am very skillful at self-archiving documents/articles</td>
<td>4 (8.6)</td>
<td>11 (23.4)</td>
<td>10 (21.3)</td>
<td>15 (31.9)</td>
<td>7 (14.9)</td>
<td>5.17</td>
<td>1.307</td>
</tr>
<tr>
<td>I find it easy to get the repository to do what I need to do</td>
<td>3 (6.4)</td>
<td>12 (25.5)</td>
<td>8 (17.0)</td>
<td>16 (34.0)</td>
<td>8 (17.0)</td>
<td>5.28</td>
<td>1.263</td>
</tr>
<tr>
<td>Self-archiving is not-time consuming</td>
<td>7 (14.9)</td>
<td>13 (27.7)</td>
<td>7 (14.9)</td>
<td>15 (31.9)</td>
<td>5 (10.6)</td>
<td>4.87</td>
<td>1.439</td>
</tr>
</tbody>
</table>

Note: *Disagree refers* to “strongly disagree”, “disagree” and “slightly disagree”. Figures in parentheses are percentages

Table VI. Descriptive statistics for effort expectancy 
(n = 47)
Pearson correlations were carried out to test the relationships between performance expectancy, effort expectancy, social influence, facilitating conditions, current practices and behavioral intention. Relationships between the constructs that showed statistically significant relationships with each other are also reported (Table IX).

Table VII.
Descriptive statistics for social influence (n = 47)

<table>
<thead>
<tr>
<th>Item statement</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Slightly agree</th>
<th>Agree</th>
<th>Strongly agree</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other researchers think I should self-archive my research work</td>
<td>0 (0)</td>
<td>21 (44.7)</td>
<td>13 (27.7)</td>
<td>10 (21.3)</td>
<td>3 (6.4)</td>
<td>4.89</td>
<td>0.961</td>
</tr>
<tr>
<td>My students think I should self-archive my research work</td>
<td>2 (4.2)</td>
<td>26 (55.3)</td>
<td>2 (4.3)</td>
<td>12 (25.5)</td>
<td>5 (10.6)</td>
<td>4.81</td>
<td>1.227</td>
</tr>
<tr>
<td>My institution thinks I should self-archive my research work</td>
<td>2 (4.2)</td>
<td>18 (38.3)</td>
<td>7 (14.9)</td>
<td>13 (27.7)</td>
<td>7 (14.9)</td>
<td>5.09</td>
<td>1.248</td>
</tr>
<tr>
<td>Institutional repository administrators are very supportive to guard me in self-archiving</td>
<td>3 (6.4)</td>
<td>21 (44.7)</td>
<td>5 (10.6)</td>
<td>10 (21.3)</td>
<td>8 (17.0)</td>
<td>4.96</td>
<td>1.318</td>
</tr>
<tr>
<td>Academicians who support and self-archive articles have more prestige than those who do not</td>
<td>3 (6.4)</td>
<td>14 (29.8)</td>
<td>14 (29.8)</td>
<td>10 (21.3)</td>
<td>6 (12.8)</td>
<td>5.02</td>
<td>1.189</td>
</tr>
</tbody>
</table>

Note: “Disagree” refers to “strongly disagree”, “disagree” and “slightly disagree”. Figures in parentheses are percentages

Table VIII.
Descriptive statistics for facilitating conditions (n = 47)

<table>
<thead>
<tr>
<th>Item statement</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Slightly agree</th>
<th>Agree</th>
<th>Strongly agree</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>The institutional repository is quite secure to use</td>
<td>1 (2.1)</td>
<td>13 (27.7)</td>
<td>10 (21.3)</td>
<td>19 (40.4)</td>
<td>4 (8.5)</td>
<td>5.26</td>
<td>1.031</td>
</tr>
<tr>
<td>I have the knowledge necessary to use the repository</td>
<td>2 (4.2)</td>
<td>10 (21.3)</td>
<td>6 (12.8)</td>
<td>21 (44.7)</td>
<td>8 (17.0)</td>
<td>5.45</td>
<td>1.265</td>
</tr>
<tr>
<td>The features of the repository are very easy to explore/navigate through</td>
<td>2 (4.2)</td>
<td>11 (23.4)</td>
<td>11 (23.4)</td>
<td>16 (34.0)</td>
<td>7 (14.9)</td>
<td>5.26</td>
<td>1.293</td>
</tr>
<tr>
<td>There is an administrator available for assistance with system difficulties</td>
<td>5 (10.6)</td>
<td>14 (29.8)</td>
<td>8 (17.0)</td>
<td>15 (31.9)</td>
<td>5 (10.6)</td>
<td>4.96</td>
<td>1.367</td>
</tr>
<tr>
<td>It is quite easy to access the repository</td>
<td>1 (2.1)</td>
<td>13 (27.7)</td>
<td>9 (19.1)</td>
<td>18 (38.3)</td>
<td>6 (12.8)</td>
<td>5.28</td>
<td>1.211</td>
</tr>
<tr>
<td>The repository has valid links and hyperlinks</td>
<td>3 (6.4)</td>
<td>10 (21.3)</td>
<td>9 (19.1)</td>
<td>19 (40.4)</td>
<td>6 (12.8)</td>
<td>5.28</td>
<td>1.263</td>
</tr>
<tr>
<td>It is very fast to upload documents/articles</td>
<td>3 (6.4)</td>
<td>14 (29.8)</td>
<td>11 (23.4)</td>
<td>15 (31.9)</td>
<td>4 (8.5)</td>
<td>5.02</td>
<td>1.225</td>
</tr>
</tbody>
</table>

Note: “Disagree” refers to “strongly disagree”, “disagree” and “slightly disagree.”
Table X provides a summary of the Pearson correlation coefficients analysis to test the relationships between the UTAUT model constructs for each hypothesis. It shows that no statistically significant relationships existed between the four constructs and behavioral intention. This clearly indicates that positive PE, EE, SI and FC will not increase the possibility of Malaysian authors’ acceptance to self-archiving in open access repositories to support the dissemination of research output. These findings are inconsistent with those of Venkatesh et al. (2003). However, the correlation analysis showed a positive significant relationship between performance expectancy and effort expectancy ($r = 0.520, p < 0.001$), social influence ($r = 0.684, p < 0.001$) and facilitating conditions ($r = 0.647, p < 0.001$). The correlation analysis also showed a positive significant relationship between effort expectancy and social influence ($r = 0.493, p < 0.001$) as well as facilitating conditions ($r = 0.812, p < 0.001$). Finally, the results concluded that there was a positive significant relationship between social influence and facilitating conditions ($r = 0.575, p < 0.001$).

**Discussion and conclusions**
This study brought forth Malaysian authors’ readiness to self-archive in institutional repositories through the application of the UTAUT model of Venkatesh et al. (2003). The results did not provide strong support for the UTAUT model. The UTAUT model also considers gender, age, experience and voluntariness of use. The UTAUT model was modified to suit this study, which is why the four moderators (gender, age, experience and voluntariness of use) influencing the four direct determinants.
Performance expectancy, effort expectancy, social influence, and facilitating conditions were not included in the study. A correlation analysis between the four constructs of the UTAUT model and behavioral intention showed that no statistically significant relationships existed between the constructs and behavioral intention. Most of the studies reviewed on the application of the UTAUT model to a particular computer or internet technology are contradictory to the findings from this study. It proves the following:

- Performance or higher gains of adoption as well as personal merits has no effect on authors’ behavioral intention to self-archive in open access repositories. Most of the studies reviewed on the application of the UTAUT model to a particular computer or internet technology are contradictory to the findings from this study. El-Gayar and Moran (2006), who conducted a web-based survey on college students’ acceptance of tablet PCs at a Midwest public university found that performance expectancy was statistically related to behavioral intention to use tablet PCs at $r = 0.19, p < 0.5$. Also, Wu et al. (2009) found that performance expectancy was statistically related to behavioral intention to adopt 3G mobile telecommunications at $r = 0.419, p < 0.01$. Similar results were reported by Cheng et al. (2008), who found that performance expectancy had a statistically significant positive influence on the usage of internet banking. Jong (2009) also conducted a study that resulted in 606 usable responses. He found that performance expectancy was statistically related to behavioral intention to use learning management systems. A web-based study was conducted by Oluchi (2010) on the acceptance of a digital library survey among graduate students; it was reported that performance expectancy was statistically related to behavioral

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Statistical findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>$H1$. There is a significant positive correlation between performance expectancy and behavioral intention of Malaysian researchers to self-archive in their institutional repository</td>
<td>Performance expectancy did not correlate significantly with behavioral intention at $r = 0.029, p = 0.852$</td>
</tr>
<tr>
<td>$H2$. There is a significant positive correlation between effort expectancy and behavioral intention of Malaysian researchers to self-archive in their institutional repository</td>
<td>Effort expectancy did not correlate significantly with behavioral intention at $r = 0.098, p = 0.532$</td>
</tr>
<tr>
<td>$H3$. There is a significant positive correlation between social influence and behavioral intentions of Malaysian researchers to self-archive in their institutional repository</td>
<td>Social influence did not correlate significantly with behavioral intention at $r = -0.007, p = 0.963$</td>
</tr>
<tr>
<td>$H4$. There is a significant positive correlation between facilitating conditions and current self-archiving practices of Malaysian researchers to self-archive in their institutional repository</td>
<td>Facilitating conditions did not correlate significantly with behavioral intention at $r = -0.146, p = 0.351$</td>
</tr>
<tr>
<td>$H5$. There is a significant positive correlation between behavioral intention and current self-archiving practices of Malaysian researchers to self-archive in their institutional repository</td>
<td>Behavioral intention did not correlate significantly with current self-archiving practices at $r = -0.041, p = 0.794$</td>
</tr>
</tbody>
</table>

Table X. Pearson correlations coefficients for $n = 47$
intention developers to raise intention to use electronic library systems (ELS). Also, Chiu et al. (2010) conducted a study on early versus potential adopters in exploring behavioral intention in retail service innovation in Taiwan. These researchers found that performance expectancy was statistically related to behavioral intention to use retail service innovations at $\beta = 0.190$, $p < 0.005$.

- Effort expectancy or ease of use of the institutional repository has no effect on authors’ behavioral intention to self-archive in open access repositories. This is consistent with most studies where there was no statistically significant relationship between effort expectancy and behavioral intention to use a particular computer technology. A case in point is the study by Wu et al. (2009), who employed the UTAUT model to see whether the major constructs in the theory will help explain users’ intentions. They found that effort expectancy had no statistically significant relation to behavioral intention to adopt 3G mobile telecommunication. Cheng et al. (2008) found that effort expectancy had no statistically significant relationship with behavioral intention to use internet banking. A similar study by Zhou (2008) found that effort expectancy was not statistically related to behavioral intention to use mobile phones. Schaupp et al. (2009) conducted a web-based survey of MBA students in the USA. They found that effort expectancy had no statistically significant relationship with behavioral intention to adopt e-file. Šumak et al. (2010) conducted a web-based empirical survey on a virtual learning environment, and they found that effort expectancy had no statistically significant relationship with behavioral intention to use Moodle.

- Social influence or influence from peers did not have an effect on authors’ behavioral intention to self-archive in institutional repositories. This finding is consistent with the findings of a study by Aoun et al. (2010), who found that there was no statistically significant relationship between social influence and behavioral intention to use accounting information systems (AIS) in Australia. However, most findings from previous studies conflict with most of this study (El-Gayar and Moran, 2006; Wu et al., 2009; Cheng et al., 2008; Zhou, 2008). Wang et al. (2010) found that social influence and behavioral intention were statistically significant and they concluded that social influence was a predictor of teachers’ intention to implement distance learning. This was also supported in the study by Tibenderana et al. (2010) who found that social influence was statistically significant to behavioral intention to use hybrid library services.

- Facilitating conditions or technical infrastructure has no effect on authors’ behavioral intention to self-archive in open access repositories. This is consistent with the study by Maldonado et al. (2009), who employed the UTAUT model to test students’ acceptance of an educational portal and found that facilitating conditions had no statistically significant relationship with user behavior. However, other studies found that facilitating conditions were significantly related to behavioral intention to use mobile phones (Zhou, 2008), in the adoption of e-government services in Kuwait, and in the adoption of 3G mobile telecommunication (Wu et al., 2009). A study by Wang et al. (2010) found that facilitating conditions and behavioral intention were statistically related, and they concluded that facilitating conditions were a predictor of teachers’ intention
to implement distance learning. Similar findings by Tibenderana et al. (2010) also found that facilitating conditions were statistically related to behavioral intention to use hybrid library services. Chiu et al. (2010), found that facilitating conditions were statistically related to behavioral intention and concluded that facilitating conditions were a significant predictor of the use of retail service innovations.

This study found that there was no statistically significant relationship between behavioral intention and current self-archiving practices (use behavior). Behavioral intention did not influence authors’ current self-archiving practices (use behavior) in self-archiving in their institutional repository. This shows that authors’ behavioral intention has no effect on actual self-archiving practices. This is consistent with studies by Al-Shafi et al. (2009), who conducted a survey on the adoption of e-government services in Qatar.

One significant finding is that although the four constructs were not significant to behavioral intention, they were significant to each other. The correlation analysis showed a positive significant relationship of effort expectancy, social influence and facilitating conditions with performance expectancy. There was also a positive significant relationship of social influence and facilitating conditions with effort expectancy. The results concluded that there was a positive significant relationship between facilitating conditions and social influence. Specifically, these results indicate that these constructs do influence each other, since they have an effect on each other.

The results did not provide strong support for the UTAUT model, and this conflicts with findings from most previous studies in which it was found that a statistically significant relationship existed for performance expectancy, social influence and facilitating conditions with behavioral intention. However, it can be seen that most of these studies had large sample sizes as compared to the current study. Further, the studies were done in different technological environments. This could explain why there is no statistically significant relationship between the constructs and behavioral intention in this study. As such, the researchers suggest that future research be carried out comprising more researchers to better determine the adoption of self-archiving and institutional repositories in Malaysian research universities, and to determine the effectiveness of the UTAUT model in carrying out such a study. Nevertheless, these results can act as a preamble and an implication of authors’ behavioral intention, which can be explored in depth via future studies. Many universities are adopting or planning to implement institutional repositories. The questions to ask are whether it is worthwhile for higher institutions to adopt institutional repositories, and why authors are still reluctant to adopt.

The research findings have the following implications for universities and their libraries:

- Self-archiving in institutional repositories will only be totally embraced if researchers are made aware of the benefits involved in self-archiving. Awareness remains a substantial factor in determining the adoption of self-archiving. A clear understanding of the benefits of open access is critical for its wide adoption by the scholarly community (Dulle et al., 2010). Most of the respondents in this study had only self-archived research materials, searched for scholarly materials and referred students and other researchers to use institutional repositories
occasionally. There is a need for open access advocacy campaigns to be carried out in universities. Papin-Ramcharan and Dawe (2006) clearly state that “if authors are unaware of the existence and benefits of archives then they cannot self-archive”. It is therefore essential to further advocate this form of scholarly communication among universities, especially as a large number of respondents failed to answer the questionnaire since they were not aware of the existence of institutional repositories. To further promote open access self-archiving, it is suggested that librarians and other information professionals be used as change agents at institutional level. Additionally, we would like to suggest the following mechanisms presented by Dulle et al. (2010) in the study towards open access advocacy and promotion. Universities or their libraries should organize workshops and seminars specifically designed to create awareness and a deeper understanding of open access. Universities or their libraries should conduct specific training sessions to researchers to demonstrate access and publishing in open access outlets. Universities or their libraries should link open access information sources to library websites for users to access. Universities or their libraries should prepare and disseminate open access promotion materials and advise authors on possible open access repositories for the dissemination of their scholarly output.

- There is a need for universities to institute policies that will enhance open access. These policies could be a means of improving and uplifting open access. One example could be promoting self-archiving through grant policies. Chan (2004) found that some research funding bodies like the Max Planck Society in Germany and the Wellcome Trust in the UK have made it mandatory for their grant recipients to publish materials in open access for any research funded by them. Lecturers and academic researchers should be required to publish their research findings in institutional repositories as a precondition of obtaining research grants. This is one of the reasons why Kim (2006), states that grant-awarding bodies and university or department actions can lead to scholars’ decisions to support open access. The establishment of mandates will probably enhance self-archiving in institutional repositories. This is because, as seen in previous studies (Swan and Brown, 2005; Miller, 2006; Kim, 2006; Sale, 2006), mandating self-archiving will augment the growth of institutional repositories. This will enable every researcher to self-archive materials in their institutional repository. We suggest that universities can gradually mandate self-archiving by introducing it step-by-step to each faculty and then later to the whole university at large.

- There is a need for the library to work hand-in-hand with the researchers to enhance open access. The role of the library as the major mediator in institutional repository success cannot be over-emphasized. Arunachalam (2004) opined that information professionals should take the leading role in the promotion of the open access movement in their respective institutions. One of the possible activities suggested for reference librarians is helping to identify current self-archiving activity on campus to aid the content recruitment effort. Revell and Dorner (2009) argue that subject librarians are in a strong position to act as change agents as they promote institutional repositories as an innovative resource. They can do this as they assist and train students and academics in
identifying potential sources to meet their information needs. Haddow (2008) notes that institutional repository success depends on extensive support for self-archiving authors from librarians. There is a need for universities to work with the library in promoting open access because librarians are better skilled in digital preservation activities that are essential in building and preserving institutional repositories. The library needs to play a better role in maintaining, managing and marketing the institutional repository. This is why Swan (2008), in his study on open access for Indian scholarship, notes that the more libraries become the mediators of self-deposit, the greater are the chances for metadata quality and digital preservation standards to be raised.

- As libraries have been seen as an ideal location for institutional repositories, repository administrators should come up with better ways of reconciling with publishers. This will enable them to shed light on researchers who are worried about copyright infringement rules. This is because copyright remains a big obstacle to self-archiving in institutional repositories. Plagiarism remains another issue that needs to be handled. However, these problems of copyright and plagiarism are not only problems faced by institutional repositories but also problems for other digital materials as well. Plagiarism should be dealt with accordingly, and penalties for those who plagiarize should be instituted within these institutions.

References


Haddow, G. (2008), “Self-archiving to institutional repositories is improved by assisted and mandated deposit; disciplinary culture is not a factor”, Evidence-Based Library and Information Practice, Vol. 3 No. 2, pp. 55-7.


Further reading


About the authors

Feria Wirba Singeh, from Cameroon, is a Postgraduate Student at the Department of Library and Information Science at the University of Malaya, Kuala Lumpur. She graduated with a BSc in Management Information Systems in 2007 from the American Degree Program with Excelsior College, Albany New York. Her research interests include information and communication technologies (ICT) in libraries, digital libraries and information literacy.

Associate Professor Dr A. Abrizah teaches at the Department of Library and Information Science at the University of Malaya, Kuala Lumpur. She was a teacher librarian for ten years and was then appointed as an Assistant Director at the Educational Planning and Research Division of the Ministry of Education Malaysia before joining the University in 2000. She graduated with a BSc in Environmental Engineering from Temple University, Philadelphia in 1988, and obtained her MLIS degree in 1998 and her PhD in 2007, both from the University of Malaya. She has authored many conference and journal papers related to digital libraries and open access repositories. She is the Executive Editor of Malaysian Journal of Library & Information Science. A. Abrizah is the corresponding author and can be contacted at: abrizah@um.edu.my

Dr Noor Harun Abdul Karim holds a Master’s degree in Information Science from City University in London (UK) and a doctorate in Communication and Information Studies from Rutgers, the State University of New Jersey, USA. He worked as a Librarian at MARA Institute of Technology, Malaysia before being employed as a faculty member at the Department of Library and Information Science of the International Islamic University, Malaysia. He has taught courses in quantitative research methods and social/behavioral science statistics as well as courses in organizational communication and organizational development at both Master’s and doctoral levels. In addition, he has also taught basic research methods courses and introductory statistics courses at undergraduate level in the Departments of Linguistics, Sociology, Education, Comparative Religion and Education. His main research interests are in the areas of organizational behavior and library anxiety. An additional research and teaching interest is in the area of instructional communication. He has been a Senior Lecturer in the Department of Library and Information Science, Faculty of Computer Science and Information Technology, University of Malaya, since July 2009.

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