

Academic authors, scholarly publishing and open access in Australia

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Abstract

This paper briefly describes the rapidly changing research evaluation and funding landscape in Australian universities, specifically in relation to open access and institutional repositories. Recent announcements indicate that funding and evaluation bodies are becoming increasingly concerned that publicly funded research be made publicly available. The paper then reports a survey of all levels of academic staff plus research students at one Australian university conducted in May 2006, prior to the introduction of an institutional repository. The survey, in line with previously reported surveys, found that while there was a high level of engagement with scholarly publishing, there was a low level of awareness of, or concern with, either open access ('green' or 'gold') or the roles repositories can play in increasing accessibility of research. Practically, this indicates that much work needs to be done within this university to increase knowledge of, and change behaviours with regard to, open access and repositories if the university and its academics are to make the most of new funding requirements and research evaluation processes.

Introduction

Electronic publishing, institutional repositories, open access and other new technological opportunities have all led to changes in scholarly publishing; one effect has been increased accessibility of research output, such as publications. These changes are, however, emerging without the participants fully understanding what the changes may actually mean for scholarly communication, and how the nature of scholarly work may be affected. A long-term PhD research project by the author is under way, investigating the changes that repositories may bring at one Australian university. This research aims to study and increase the understanding of the institutional repository which is being introduced, the context in which the implementation is taking place and the cultural and political processes within and beyond the organisation in relation to the implementation. To start the project, an exploratory survey was administered, and this paper summarises the response to that survey. First, however, it is important to understand the context within which the repository is being implemented.

Context

At present many of the 37 Australian universities have implemented, or are considering implementing, institutional repositories. While this is going on, there is much discussion about the role of such systems and the effects they may have. Further, while there is a common-sense explanation of the 'benefit' of such systems, they are currently under-utilised and their effects largely speculated upon[1]. A case study of an actual implementation combined with a longitudinal study of use over time would therefore provide useful insight. An opportunity exists for such a case study at the University of New South Wales (UNSW),

which is in the early stages of implementing an institutional repository. UNSW is part of the ARROW (Australian Research Repositories Online to the World; <http://arrow.edu.au>) project, which is one of the four initial projects funded by the Australian Department of Education, Science and Training (DEST; http://www.dest.gov.au/sectors/research_sector/default.htm) through the Australian Research Information Infrastructure Committee (ARIIC), under the Systemic Infrastructure Initiative (SII) Accessibility Framework. ARIIC's goals are to build a technical information infrastructure to support the creation and dissemination of and access to knowledge, and the use and management of digital assets. The aim is to improve Australia's ability to take part and lead in national and international research [2]. ARROW originally consisted of three university consortium partners, Monash University, Swinburne University of Technology and UNSW, managed by their respective university libraries. The National Library of Australia was the fourth original partner, whose specific role was to trial a federated resource discovery (search) system for Australian institutional repositories. The University of Southern Queensland joined the consortium in September 2006. In addition to the consortium partners ARROW has also added community members who use the software developed by the ARROW project. These are: Queensland University of Technology, Central Queensland University, University of South Australia, University of Western Sydney and La Trobe University. RUBRIC (Regional Universities Building Research Infrastructure Collaboratively) Project members who have joined the ARROW Community are: Macquarie University, Murdoch University, University of the Sunshine Coast, University of Newcastle and University of New England."

The ARROW project's initial objectives were to:

- 'identify and test software to support best-practice institutional digital repositories at the ARROW Consortium member sites to manage e-prints, digital theses and electronic publishing.
- develop and test a national resource discovery service using metadata harvested from the institutional repositories by the National Library of Australia.' [3].

The UNSW is piloting an institutional repository in 2006, using open source software with a commercially developed proprietary deposit form. The UNSW Library aims for the implementation to focus on user and organisational requirements rather than the technology [4].

At the same time, the Australian Government has been developing a Research Quality Framework (RQF) to improve the evaluation of the quality and impact of publicly funded research and to design an effective process to achieve this [5]. Currently DEST collects data each year on research and publications from universities, which is used, together with data on the number of research students and completed research degrees, and grants won, to help determine how money will be allocated to universities. For research publications to be counted they must meet several criteria, including having been peer reviewed [6]. In October 2006 a paper titled the *Recommended RQF* was released [7] which, as well as outlining the implementation methodology for the future RQF, also drew attention to the fact that the RQF was developed in conjunction with the Accessibility Framework, and that repository and other projects supported through the Accessibility Framework would therefore have a role to play as RQF Information Management Systems. Indeed, one of the ARROW partners, Monash University, has conducted a trial of the use of repositories for the RQF, designed to inform preparation for RQF-repository integration.

Further developments on accessibility (undated but the document states that it is current as of November, 2006: p.10) have recently been announced by the Australian Research Council

(ARC). The ARC indicated that, while researchers will take account of considerations such as ‘the status and reputation of a journal or publisher, the peer review process of evaluating their research outputs, access by other stakeholders to their work, the likely impact of their work on users of research and the further dissemination and production of knowledge’[8], the ARC nonetheless wishes to ensure the ‘widest possible’ dissemination of research it funds. It therefore encourages researchers to consider putting their data and publications into an institutional repository, and if they do not, to explain the reasons in their final report.

Thus it is clear that the Australian repositories landscape is undergoing rapid change. When the study commenced at the beginning of 2006, UNSW had only a trial repository, about which information had not been widely disseminated. In May 2006, when the survey was distributed, there was still little knowledge about open access, its benefits or requirements (as will be reported); by the end of the year, however, repositories were featuring largely in government reports on the planned research assessment exercise (the RQF) and in government guidelines for applicants for research funding.

Method

To examine change it is helpful first to understand the current situation. A number of surveys have been conducted looking at how authors view open access, repositories and scholarly publishing at a particular point in time. We were interested to see whether similar findings would emerge in a study surveying authors from a single university, but covering a broad range of disciplines, interests, levels of seniority, research and publishing activity etc. Previous studies contacted potential respondents from a variety of sources. Swan and Brown [9] surveyed a group of authors who had published in OA journals, and compared these with non-OA authors from a list obtained from Thomson ISI Web of Knowledge (ISI). They later carried out another survey of authors looking specifically at author attitudes and behaviour in regard to self-archiving [10]. The respondents to this latter survey comprised four sub-populations: from open access- and publishing-related online discussion lists, whom they termed the ‘interested and informed’ population; from email addresses culled from OA repositories – the ‘archived’ population; from authors at a university where deposit is mandatory, the ‘Southampton’ population; and from randomly selected ISI authors, the ‘randomly selected’ population. Rowlands and Nicholas [11] sent their survey invitation to 76,790 randomly selected corresponding authors who had published in an ISI-indexed journal during 2004. Both these surveys covered a range of countries and institution types (e.g. university, hospital, government etc.).

One issue with surveys primarily targeting ISI authors, particularly for authors outside of the US or Europe, is that although ISI-indexed journals are of high quality, ISI covers only a proportion of the journals published in each discipline (many Australian scholarly journals, for example, are not represented¹). In addition, ISI favours English language and US and European titles, traditional publishers, and science over the social sciences and humanities, and has other coverage limitations [12, 13]. Authors in ISI-indexed journals, while undoubtedly ‘quality’ authors, cannot therefore be held to be representative of all authors.

The web-based survey was distributed via a link in an email to academic staff and research students on the UNSW campus; a copy is available from the author on request. Two pre-tests and a pilot indicated a low level of knowledge of the subject under investigation.

¹ For example *Ulrich’s Periodicals Directory* online version searched on 25 September, 2006 finds 718 Australian, active, refereed journals of a scholarly academic nature. However, *ISI’s Journal Citation Reports* only list 17 social science and 60 science titles with a country of origin of Australia (also searched 25 September, 2006).

Accordingly, brief descriptions of the phenomena under investigation were included (see Appendix 1). The survey is a blunt instrument, designed to give an overall picture that cannot be obtained in other ways, and to identify particular areas of interest to be investigated in more detail at a later stage.

Findings

Respondents

The overall completed response rate was low, comprising of 145 (6.6% of 2186) academic staff and 57 (2.2% of 2,627) research students,[14] providing a total of 202 (4.2%) completed surveys. In addition there was a high non-completion rate; an additional 152 people began the survey, but did not complete it. This supports the view that many respondents had difficulty with the subject under investigation. Even those who completed the survey reported difficulties with the topic. The academic respondents came from across the range of academic levels (see Table 1). Generally, the more senior the academic, the likely the respondent was to be engaged in publishing, as an author, reviewer or editor. This level of engagement also sometimes translated into knowledge about open access or institutional repositories.

| Table 1: Academic Levels | Number | % |
|------------------------------------|---------------|----------|
| Professor | 18 | 8.9 |
| Associate Professor | 20 | 9.9 |
| Senior Lecturer | 43 | 21.3 |
| Lecturer | 30 | 14.9 |
| Associate Lecturer | 6 | 3.0 |
| Research only staff | 20 | 9.9 |
| PhD or Masters by research student | 57 | 28.2 |
| Other | 8 | 4.0 |
| Total Respondents | 202 | |

The disciplines from which respondents were drawn comprised a reasonable cross-section; the largest group came from the medical and health sciences (as in Rowlands' and Nicholas' [15] study).

Scholars as Authors

Like Rowlands and Nicholas,[15] we find that a high proportion of respondents play active roles in the publishing process and therefore have an interest in its future. Their respondents were all authors, from a variety of organisational backgrounds; 76.7% were involved as referees, 23.6% as members of editorial boards and 8% as editors. If we filter out the research students in our survey we find comparable results; 93.4% of staff respondents were active as authors, 75% as referees, 30.9% as editorial board members and a much higher proportion (21.1%) as editors. Journal editors were generally drawn from more senior staff (Professors 44.4%; Associate Professors 20%; Senior Lecturers 21.4%; Lecturers 10%; Associate Lecturers 0%, and Research Only staff 25%). We may speculate that editorship is a contribution that university academic staff, especially senior academic staff, are particularly likely to make to scholarly publishing.

As with previous studies [10, 16] we find that while communication with peers is the most important reason to publish (93.9%), all the other reasons given to respondents to choose from are also seen as important with the exception of 'direct financial reward'. Over the whole sample 87.3% of respondents ranked 'Indicator of research performance' as important;

87.3% also ranked 'Accreditation/recognition' as important; 79.2% 'Communicate results to anyone' and 73.5% 'Validate findings'. Again, it is interesting here to tease out the differences between levels of academic seniority. 100% of Professors state that 'Communicate with peers' is an important reason for publishing; 83.3% consider 'Accreditation and recognition' important, 77.4% consider publication as an 'Indicator of research performance' and only 72.2% consider 'Communicate results to anyone' important. For Lecturers, a similarly high percentage (90.0%) see 'Communicate results to peers' as important, and 83.3% in order to achieve 'Accreditation and recognition' whereas far more of them (86.6%) publish in order to 'Communicate results to anyone' or as an indicator of research performance (90.0%). There are therefore differences in attitudes to publishing between the different levels of academic seniority; there are also a number of strong motivators for academics to publish their research, some (such as communication with peers) which are satisfied by the traditional journal system, and others which might be better served by open access.

This university's authors value the perceived prestige of the outlet, the existence of formal peer review (not just as an indicator of quality and peer validation, but also as a necessary criteria for publications to be counted under the current Australian research evaluation regime), breadth of exposure, and likelihood of acceptance and speed of publication as issues of importance. The ability to put either pre- or post-peer reviewed versions on line, and the ability to retain copyright, are not considered so important. This is perhaps the first indication of a lack of awareness of, or concern with, open access and self-archiving issues.

It is interesting to note that more than one half (55.8%) of the authors surveyed do not keep track of their citation counts; however, this may change in future, as the proposed RQF suggests that citations may be one way in the future of assessing research quality, [17] and it has been reported that authors tend to publish in the way that earns them the most points for peer recognition, funding agencies and employing institutions [16]. Further, of the 185 respondents who circulate their work (drafts prior to publication or completed works after publication) other than through journals or conferences, 89.2% do this via e-mail. This is a role that could be more easily performed via a link to a repository.

Scholars as readers

To participate in research, academics also read other scholars' work. Scholars at UNSW report that they have easy access to most of the articles they need to read, although only 20% have easy access to *all* of them.

It is interesting to note how respondents searched for and accessed the scholarly information they required. While, as expected and in line with earlier studies,[10] 96.6 % at some time in their research accessed full text articles via closed (fee charging) databases, 88.1% used bibliographic databases to search for scholarly information, and only 33.3% used specialist open repository discovery tools; a staggering 94.5% utilised Google, Google Scholar or other general search engines to search for scholarly information.

This survey was conducted in May 2006, a little over a year after Google Scholar beta was released. In retrospect, it would have been interesting to have differentiated between Google and Google Scholar, as anecdotal comments indicate that Google Scholar is increasingly becoming the first choice of search tool on campus, with other tools acting more as backup and confirmatory resources.

Open access journals

Only a very small number (24 or 11.9%) of survey respondents had submitted an abstract to, or published in, an open access journal in the last year. The response 'Not sure' (16 - 7.9% of respondents) was added as it became apparent during the pilot testing that some respondents believed that, if they could find journals online and access the articles, particularly if they used Google or Google Scholar to find the articles, the journals were open access. Other studies have also flagged the possibility of authors misunderstanding the concept of open access [15]. Respondents to the pilot did not realise that other factors could contribute to the ability to access articles online, such as searching online within a university campus network where IP filtering for subscription-based journals was available, or that they might be accessing e-prints of articles (author copies) made available through repositories, rather than the actual journal at the publisher's site.

To further check for this, in the survey authors were asked for the titles of the open access journals they had submitted to. Twenty-five respondents listed 29 titles, of which 24 were OA and 4 not OA, and one title could not be found; it therefore seems that while the problem is not as widespread as the pilot testing would indicate, it is nonetheless an issue needing clarification. Interestingly, of the 24 OA titles, 14 (58%) were in the medical area, including *Public Library of Science*, *BioMed Central*, the *Medical Journal of Australia* and *Australia and New Zealand Health Policy*.

While only 24 (11.9%) had in fact published in open access journals in the last year², 91 (45%) indicated that they were very likely or likely to do so in the next three years, while only 51 (25.2%) indicated that they were unlikely to, or would not do so. 60 (29.7%) were uncertain.

Looking beyond the last year, 40 (20%) respondents reported that they had ever published in an OA journal. Respondents were asked why they did so, and provided with a space to suggest additional reasons. Many respondents had more than one reason. Just over half of those who had ever published in an OA journal, 23 (57.5%), indicated that the reason was the principle of free access for all readers. This is in contrast to those surveyed by Swan and Brown,[18] where almost all (92%) of OA authors gave this reason. We can only speculate that this difference arises as a result of lack of awareness of the debate on open access; possibly, because UNSW authors operate on a campus where access to resources is relatively easy and well enabled by the library, they have not given much thought to the access issues that readers off-campus may face. Of course, in certain fields, an OA journal may simply be the best journal for that particular piece of work. In this survey, respondents' reasons for publishing in OA journals were closely related to their reasons for selecting journals in which to publish: faster publication times (45%), journal prestige (37.5%), and the perception that the journals have high impact (also 37.5%) or will provide more citations (9%) in their field.

The survey also sought to understand why authors have not published in OA journals. By far the highest number of authors, 74 of 157 respondents to this question (47.1%) indicated that their decision regarding where to publish was more directly related to their research purpose and that whether or not the journal was OA did not matter to them. The next largest group indicated that they were not familiar with OA journals in their field (55 of 157; 35%), closely followed by the perception that OA journals have low prestige (50 of 157; 31.8%) or impact (42 of 157; 26.8%). Most of the comments in the 'Other' section related specifically to reputation or ISI journal impact factors; one respondent commented that he felt OA journals were often sponsored (which he related to advertising) and therefore compromised. As in an

² One of the 25 mentioned above had wrongly identified the journal as OA

earlier study,[10] authors who have not published in OA journals say that they perceive OA journals to have low impact and prestige, in contrast to some at least of those authors who have published in OA journals. Perhaps surprisingly, this does not appear to depend on the author's field. For example, Seven (46.7 %) of the 15 who have published in OA journals AND believe they ARE prestigious are from the medical and health sciences and 16 (or 32%) of the 50 who do not publish in OA journals because they believe they are NOT prestigious are from that same field. This indicates that there is no agreement within the medical discipline on the prestige of existing OA journals.

Ninety-one (45%) of respondents believe that they are likely to publish at least one article in an OA journal in the next three years: fifty-one (25.2%) believe that it is 'very likely'; forty (19.8%) consider it 'likely'. Twelve (5.9%) will not do so. The remaining ninety-nine (49%) are ambivalent: 14.4% 'neither likely nor unlikely'; 19.3% 'somewhat unlikely'; and 15.3% 'unsure'.

Interestingly, senior academics were more likely to have published in open access journals (Professors 27.8%; Associate Professors 30%, Senior Lecturers 20.4%; Lecturers 3.3%). This may be because the greater role they play in publishing as editors, for example, gives them more understanding of publishing issues, or perhaps that free of constraints to climb the promotions ladder, they may publish where they wish.

Self-archiving

The survey indicated that 141 (69.8%) had not self-archived their research output in any way, although, for those that had, by far the most common was via a final draft of the post-peer review copy on a personal web page (25; 12.4% of all respondents). This reported lack of self-archiving is vastly different from other populations; Swan and Brown [10] reported that 49% of their respondents had self-archived. It is not surprising that respondents had not deposited in an institutional repository, since UNSW had not implemented an institutional repository at the time of the survey; however the researcher was somewhat surprised at the low numbers depositing in centralised subject-based repositories (5.5%) or on personal web pages (25 of 199 respondents; 12.6%). Only 5 of the 10 physicists, and 1 of 7 mathematicians, deposited preprints in the established subject repositories (arXiv), and only one of each deposited post-prints.

Not surprisingly, given the low numbers of respondents reporting self-archiving, 116 of the 169 who responded to this question (68.6%, or 57.4% of the total) reported that prior to this survey they were not aware of the possibility of self-archiving in repositories to provide open access to their work. An even greater number (184 of 202; 90.6%) had not heard of any of the UK or US recommendations, or of the mandatory self-archiving policies of some institutions and funding bodies. Only 4 (2%) - one each from the physical sciences, information, computing and communication sciences, medical and health sciences and social sciences - indicated that their research funder had already mandated self-archiving.

Seniority also made a difference to knowledge about self-archiving. More senior academics had greater awareness of self-archiving than did more junior academics (e.g. Professors 78.6%; Lecturers 44%), although this increased knowledge did not translate into a higher level of self-archiving in practice (Professors 35.3%; Lecturers 29.6%).

However, despite low awareness and experience of self-archiving, a surprisingly high proportion of respondents indicate that they would comply with any self archiving mandate that the university or their research funder would mandate (Table 2). Only a tiny minority would not comply.

Table 2: If your employer or research funder *requires* now or were to *require* in future that you deposit copies of your articles in an open access repository, what is/would be your reaction?

| | Number | % |
|---|------------|------|
| I already comply | 11 | 5.7 |
| I would comply willingly | 149 | 77.2 |
| I do/would comply reluctantly | 27 | 14.0 |
| I would not comply/have not complied | 6 | 3.1 |
| Total Respondents to this question | 193 | |

This suggests, unsurprisingly, that UNSW is likely to have considerably more difficulty in populating its repository if self-archiving is voluntary than if it were mandatory, although the developments in the latter part of 2006 regarding the RQF, and the ARC funding requirements, may make this speculation irrelevant.

Discussion

The data provides a snapshot of the current situation with regard to publishing, open access and self-archiving within one Australian university. The importance to the respondents of publishing their scholarly work is very clear, as is the multiplicity of roles which university academics and research students play in the scholarly publishing process.

Peer review was highly valued by the respondents, and open access was equated by some of them with a lack of peer review. Further research on why authors value peer review would be interesting. An awareness campaign about how peer review is compatible with institutional repositories and open access journals might contribute to their increased use in future.

It is interesting that in reasons for publishing, 'Communicate with peers' is the strongest motivator for 100% of senior authors; while 90% of junior authors also rank this as important, a slightly higher proportion of junior authors (96%) compared with senior authors (77.4%) see publishing as providing an 'Indicator of research performance'. This may reflect not only the research evaluation climate of the university, but also the changing research evaluation and funding climate of Australia; the differences between senior and junior authors are interesting in this regard.

Generally awareness, and use, of open access journals and self-archiving is lower than reported in earlier surveys, particularly among the more junior academics/authors in this survey, who are primarily concerned with research performance and accreditation issues. Changes in research evaluation and funding, such as those in the RQF and *ARC 2008 Funding Rules*, are likely to have an impact on this behaviour. Senior academics are more aware of the issues about scholarly publishing, open access and repositories, perhaps thanks to the increased knowledge which they gain about publishing as they progress from authors to reviewers to editors. Generally speaking, however, at the time of the survey this greater knowledge had not been translated into self-archiving practice. The survey did, of course, only cover staff and research students at a single Australian university, and at the time of the survey many Australian universities were in the process of implementing institutional repositories, with most still in the early stages and prior to any awareness. This is borne out by both responses and comments in the survey, which indicate that authors at UNSW are, in general, not familiar with open access, self-archiving and institutional repositories. The

developments reported earlier, such as the RQF, and the *ARC 2008 Funding Rules*, will inevitably have an impact as universities encourage their academics to observe the recommendations.

As is the case globally, scholarly publishing, open access and the repository movement in Australia are undergoing major change and there is much uncertainty about the future. This is reflected in the responses to the survey; it is therefore important that we continue to conduct research in order to understand more about the needs of authors, readers and other stakeholders in the scholarly publishing system and the technological opportunities provided by repositories and open access.

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Appendix 1: Definitions provided with the survey

Open access journals

Explanation: Open access (OA) journals provide access to readers free of charge. Access is generally paid for, not by readers or their libraries, but in other ways, for example by fees collected from authors; or by sponsors; or by an agency. A list of open access journals is available at the Directory of Online Open Access Journals (DOAJ) <http://www.doaj.org>.

Self-archiving

Explanation: Self-archiving is where authors deposit full text copies of pre-refereed drafts, post-refereed drafts, publishers marked up copy, or any reprint or e-print of their articles, conference papers etc. to institutional or discipline/subject based repositories, or even to personal or institutional web pages and with the intention of making the full text of their work freely available. Self-archiving is an adjunct to the traditional publishing framework.

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