Chapter 4 -
Research design

Introduction

As Chapter 3 has demonstrated, even allowing for a lack of awareness of open access in the academic community, there appears to be a divide between people's belief in, and professed support for, open access and their willingness to adopt the behavioural change that will make it happen. Despite the widely published benefits of having scholarly literature openly accessible, the level of uptake of open access dissemination remains low in the international academic community. Australia is no exception and this study aims to discover why researchers in Australia are not embracing open access by asking: "How are the communication practices between researchers affecting the uptake of open access scholarly dissemination in Australia?"

As indicated in Chapter 3, this research focuses on the individual academic. The study is concerned with Australian researchers and their publication decisions. Determining engagement with and attitudes towards open access is only part of what the research is designed to uncover. It takes a broader view of the scholarly communication process and investigates how individual researchers view their refereeing responsibilities, how they search for information and how they decide where to send their papers for publication. Therefore, the more detailed questions that will be addressed are:

> What is the general awareness and use of open access by Australian researchers?
> Is there a reason other than lack of awareness for the non-uptake of open access options?
> What factors do researchers consider when choosing a publication output?
> How do researchers find the literature they use in their work?
> Is copyright a consideration for researchers?
> Do funding requirements have an influence on publishing behaviours?
> What is the level of satisfaction of the current peer review system?

This research uses grounded theory but begins with some premises drawn from previous work. Despite the understanding that in grounded theory, the theory emerges from the research, studies using grounded theory often begin with some premises, however quietly whispered (Silverman, 2001). In this instance, the first premise is that the reason Australian researchers have yet to embrace open access communication is not simply

because they are unaware of it, but because the means to achieve open access run counter to their scholarly communication norms. The second premise is that the reward system in academia is a considerable part of the larger picture. The third premise is that an important element in the uptake of open access is the individual researcher. This thesis is not questioning whether open access should be a considerable part of the future of scholarly publishing.

This chapter describes in detail the approach used for this research. The research was qualitative, based on the conclusions reached in Chapter 3. There is also a description of other factors affecting the decision-making when choosing the methods of this study. The chapter includes a comprehensive description of how the people selected for the study were sourced, as well as a description of the steps taken in the analysis of their responses. There is a description of the triangulation study that was completed in order to consolidate some of the ideas emerging from the analysis. The chapter concludes with an acknowledgement of the limitations of this study design.

Overview of the research

This research explores researcher behaviour, and this is a good example of the type of phenomena "that are difficult to convey with quantitative methods" (Strauss & Corbin, 1990, p. 19), but whose intricate details can be uncovered by the use of qualitative methods. Qualitative methods can be used to gain novel and fresh slants on areas of research that have already been studied in other ways. The broad research question of this thesis is attempting to uncover the nature of researchers' experiences with scholarly publication.

This research is focused on trying to understand the process of changes to the scholarly publication system. 'Change and process' studies usually begin with questions about what is happening in a given situation and are often grounded theory studies (Morse & Richards, 2002, p. 55). This research is not attempting to test a hypothesis about reality, but is trying to determine how the 'actors' in this scenario (researchers in universities) interpret reality (Suddaby, 2006). This attempt to understand change and process reflects the grounded theory approach: "taking the perspective that reality is negotiated between people, always changing, and constantly evolving … the methods of making and analysing data [in grounded theory] reflect a commitment to understanding the ways in which reality is socially constructed" (Morse & Richards, 2002, p. 54).

The main purpose of using the grounded theory method is to develop theory. To do so the research process needs a research question or questions that give the flexibility and freedom to explore a phenomenon in depth (Strauss & Corbin, 1990, p. 37). The question

"How are the communication practices between researchers affecting the uptake of open access scholarly dissemination in Australia?" is deceptively simple, masking the complexity of the topic. The number and range of questions that were used to attempt to elicit this information gives an indication of this. The next section describes several possible research method options and their appropriateness for this research project.

Literature analysis

One method of data gathering is a literature analysis. This is separate from the literature review already conducted in this study, which has informed the research question and is detailed in the Chapters 2 and 3. When considering undertaking a literature analysis, the obvious issue is the amount and type of literature available to the researcher. Given the subject matter of research in the area of scholarly communication, the potential literature is vast – the entire published output of the Australia academic community for a given period of time. However, in terms of open access issues, an analysis of this information alone would only provide a guide to the level of uptake of open access in Australia.

There is some scope for a small literature analysis in a study focused on the motivations of particular researchers. Patterns such as a tendency to publish in certain journals, or choosing open access journals (and whether they are aware of these or not) provide either a starting point for an interview or an interesting background for a survey. In addition, the availability of a particular academic's publication list – be it on an individual website, a departmental website or sent as an attachment - gives an indication of how openly accessible the researcher's publications are outside the subscription system. Therefore the research design has included a request for a publication list from every academic contacted.

Observation and interviews

The research design of this thesis has drawn on work undertaken at the University of Rochester that aimed to "understand the current work practices of faculty in different disciplines in order to see how an IR [institutional repository] might naturally support existing ways of work" (Foster & Gibbons, 2005). Work-practice studies, they state, generally "spend long periods of time with the people under study, observing them as they conduct the usual tasks associated with their work". Often videotape is used for later analysis. Foster and Gibbons determined in their study that it was not feasible to spend long periods of time taping and observing their academic subjects. They opted for hour-long interviews, which were videotaped, and supplemented this data with information gathering and telephone interviews.

The focus of this research is slightly different from that of Foster and Gibbons. The specific activities that academics do that are of interest and relevance to the research questions in this study are searching for information, writing papers and reviewing papers, all of which involve cognitive work rather than action. To observe and understand what researchers were doing and why, it would be necessary to interrupt constantly to ask motivations for certain behaviours. This would be highly disruptive to the subject, and it would be unlikely that more than a handful of people would agree to participate. For these reasons observation would be an inappropriate data gathering method.

This research therefore consisted of a semi-structured interview with each of the researchers in their own offices. Semi-structured interviews are used in many different research methodologies including grounded theory (Morse & Richards, 2002, p. 91) and consist of open-ended questions developed in advance, along with prepared probes. Unplanned, unanticipated probes may also be used. The purpose of the interviews in this study is to gain a deeper understanding of the academic's motivations behind their publishing and researching decisions than would be possible by a simple written survey. The study also hopes to understand how deeply the academic understands the link between publication and reward in Australia, and the amount of time each academic spends contributing to the journal publication system.

Pilot study

Grounded theory uses early results and experiences in the empirical process to inform further research, and as outlined in the analysis section of this chapter, the first set of interviews was used to refine the question list for subsequent interviews. By way of a pilot of the questions, I met with a consultant at the Statistical Consulting Unit[i] at the Australian National University (ANU) to discuss the question list and determine whether the number of questions were reasonable in the given time (40 minutes). During the meeting, I conducted a pilot run, by interviewing the consultant following the question list as it stood. This consultation demonstrated the need to reorganise the questions so any mention of the expression 'open access' or 'institutional repository' occurred at the end. The issue of the order of the questions is discussed in detail later in this chapter. It was also clear after this interview that I needed to have a standardised definition of open access and institutional repository to give to those people who were unfamiliar with the terms.

Influences on the research design: a personal perspective

Some of the background knowledge informing this research design was not obtained from previously published research, but instead was a mixture of informal interviews and personal experiences. Described below, the attempt to 'immerse' myself in the topic at hand by various means was a deliberate research tactic. This technique, of using personal experiences, general knowledge and the stories of others is described as 'anecdotal comparison' (Glaser & Strauss, 1967). These comparisons can be "especially useful in starting research and developing core categories. The researcher can ask himself where else he has learned about the category and make quick comparisons to start to develop it and sensitize himself to its relevancies" (p. 67).

In order to gain an insight into the repository situation within Australian research institutions, in 2006 I accepted a one-year, part-time position at the Australian Partnership for Sustainable Repositories (APSR)[ii] in 2006. APSR was one of four programs funded by the federal government under the Systemic Infrastructure Initiative, administered by the (then) Department of Education Science and Training (DEST). The stated aim of APSR was to 'establish a centre of excellence for the management of scholarly assets in digital format'. Based at the ANU, the partnership consisted of four research universities (the ANU, the University of Queensland, the University of Sydney and the University of Melbourne), the National Library of Australia and the Australian Partnership for Advanced Computing (APAC).

APSR was housed in one of the ANU libraries, and many of the staff had previously worked in the Division of Information, many in the library. This meant that I was in close contact with those staff responsible for the ANU repository. My role at APSR within the National Services Program meant I was involved in the planning and execution of several workshops and I attended these and other meetings around Australia. This afforded me the opportunity to meet with many people in Australia and New Zealand who were involved in the development and advocacy of repositories, and discuss their experiences in an informal setting.

In addition, I was involved in the publication of several project reports and papers relating to the work undertaken at APSR (2007; Henty & Kingsley, 2007). The papers that resulted from empirical data had looked at a particular aspect of the development of institutional repositories. However, there were areas of this data that had specific relevance to my own research, despite being gathered with a different purpose in mind. While I will not be using this APSR data directly, my thinking and conclusions have been affected both by my experiences working at APSR and by the research I undertook while a staff member there.

Because the topic of this thesis encompasses the writing, publishing and reviewing of academic literature, it would have been remiss not to have attempted to take part in this process once I had obtained publishable data. Concurrently with researching for and writing this thesis I was able to publish several papers, both as a joint author and as a solo author (Clarke & Kingsley, 2008; Kennan & Kingsley, 2009; Kingsley, 2007, 2008b; Steele et al., 2006). In doing so, I experienced many of the problems with the scholarly communication system as discussed in Chapter 2 including delays in publication of over a year in one instance. The peer review of each of these papers was of varying rigour (ranging from what appeared to be a perfunctory glance by the editor on one paper, to two fully referenced and highly constructive reports on another).

In one instance I submitted a paper (on invitation) for the inaugural issue of a journal focused on open access research, and was only informed that the journal was not proceeding due to an 'underwhelming lack of interest' because I followed up the editor six months later. This article was altered and resubmitted to another journal, but during the review process, there was a change of government in Australia, which meant the section discussing the Research Quality Framework[1] was immediately out of date. The paper was declined. I am in the process of reconfiguring the paper to resubmit it to a journal with a different focus. By publishing papers, I also had the experience of depositing my post-prints into the ANU's repository and having feedback from colleagues who were able to access my written material using this tool.

I have also had mixed experiences with conferences. In one instance I submitted, had accepted and presented a peer-reviewed paper to a national conference (Kingsley, 2008a). I also submitted and had a paper accepted for a peer-reviewed conference held in the USA in June 2007. Due to technical difficulties with the conference website, it was not until days before departure that the conference program was available, at which point it became obvious that the focus of the conference had changed from the original promotional material. I withdrew at the last minute. This experience reflected some of those described by interviewees and while conferences had not originally been an area of great interest for the research topic, my experience reinforced some early conclusions I was making from the data. This is one concrete example of how my broader experience has informed the discussions and observations made in Chapter 7.

As I discovered in the interviews, all of the above experiences are not uncommon and most published researchers would be able to describe at least one of those experiences

[1] The Research Quality Framework (RQF) was a planned change to the funding system in Australia which was due to be implemented in 2008, however the federal government changed after a November 2007 election and the RQF was abandoned.

during their publishing career. Therefore, experiencing the academic publishing system first-hand has given me a much greater insight and understanding of the situations participants described to me in interviews. It also provided a "resource for assisting respondents to explore and describe their circumstances, actions and feelings. Indeed, citing shared experience is often a useful way of providing concrete referents on which inquiries and answers can focus" (Holstein & Gubrium, 1995, p. 45).

This technique, of a social scientist acquiring an understanding of the field being observed, has been described as "informed observation", and offers advantages over "naive observation" (which is difficult to maintain) and "native observation" where a scientist in a field becomes a social scientist later, which blurs the distinction between observer/interviewer and participant (Laudel & Glaser, 2004).

In terms of the interview process itself, my professional background is as a science journalist and communicator. Over 12 years in this area of work I have interviewed literally hundreds of scientists about their research. This experience was very helpful in terms of the innate skills an interviewer needs during an interview, such as indicating to the subject my own level of expertise and therefore how complex they need to be in their answers. This issue of negotiating the level of communication is discussed in Laudel and Glaser (2004, pp. 20-23). However, an interview conducted as a journalist to gain information for a story is very different to a research interview, and in many ways I was a novice to the research interview.

This concludes the discussion about the thinking and research that formed the background to the study design. The remainder of this chapter will look at the design of the study itself and how it was conducted.

Study design

The aim of this study was to explore the influences on scholars' publishing and researching behaviour. Three primary sources presented themselves: the administrative procedures at their institution, the funding system that all scholars operate within in Australia, or influences from the behavioural norms within their discipline. It was important to explore all three, plus other unanticipated factors.

Once the technique of data gathering was established, it was necessary to determine how to sample the loosely defined group of 'researchers in Australian higher education institutions'. As a qualitative study, this was not a random sampling issue, which attempts to gain a representative group without bias. It was, however important to obtain valid representation. There are four options: purposeful sampling, nominated or snowball

sampling, convenience sampling or theoretical sampling (Morse & Richards, 2002, p. 173). Of these, the final two were the most relevant. The next section outlines the theory behind the sample group that was chosen.

The institutional influence

Originally I considered a survey of all ANU science researchers, but once it became clear that this research question would be better served by interviews rather than surveys, the potentially large uptake of this group put the size of the study beyond the resources available to it. After some consideration, I decided that one way of establishing if the procedures in place at an institution affected a scholar's publishing behaviour was to compare the publishing and research behaviours of scholars at two Australian higher education institutions, reflecting the transferability of the research (Marshall & Rossman, 1995). The chosen institutions were the ANU and the University of New South Wales (UNSW). One reason for the decision to compare these particular universities was the disparate status of their institutional repositories.

ANU e-Prints was the first institutional repository in Australia. It has been in existence since 2001 and contains nearly 3,000 items. An open source software package, ePrints was created to allow for the deposit of author pre- or post- prints to facilitate open access to the material without the reader having to pay a subscription fee. In 2005, the ANU launched Demetrius[iii], a repository built on DSpace, incorporating the ePrints collection as a 'community'. DSpace has a wider remit than ePrints, archiving a range of digital content including images, datasets and other forms of scholarly output (Nixon, 2003).

The UNSWorks[iv] repository was still in an experimental stage at the end of 2006. This repository was part of a national research project called ARROW (Australian Research Repositories Online to the World), which began in 2004 and was another of the four projects funded by the Systemic Infrastructure Initiative. ARROW's remit was to identify and test software or solutions to support best practice institutional digital repositories. ARROW used Fedora, another open source software platform as a base for developing a proprietary software system called Vital. At the time of my interviews with UNSW staff, the repository had not been launched and no advocacy had been undertaken to increase awareness of the repository at UNSW.

It should be noted that both UNSW and ANU are well funded research intensive universities, so are ideal for the purpose of obtaining interviewees with high publication rates. However the similarities of the universities does cause some limitations to the generalisation of the results, and these are discussed in depth later in the chapter.

The funding influence

In order to attempt to address the issue of whether research funding in Australia was affecting a researcher's publication decisions, I decided to exclude Emeritus (retired) Fellows and Professors, and Visiting Fellows, as these groups are not funded as academic staff members of the university. For the same reason, and because generally PhD students are unlikely to have a publishing record, they were also deliberately excluded from the sample.

The disciplinary influence

The third potential influence on researchers' behaviour was their discipline. Given both the differing nature of research fields and the different techniques used to undertake that research across all academia, it is reasonable to assume that members of different disciplines all have their own disciplinary norms. This research is concerned with the communication practices of individual researchers, and specifically differences in publication behaviour between some disciplines is documented (Kling & McKim, 1999, p. 896). It was evident that the most logical way of determining whether disciplinary norms affect publication behaviour was to compare disciplines.

Revisiting the literature, it became evident that in the literature discussing open access, there is very little by way of discussion of disciplinary differences *itself* as a field of enquiry. Certainly several studies on researcher attitude discussed in Chapter 3 have canvassed researchers from different fields without distinguishing between them in the analysis (T. Bergstrom & Lavaty, 2007; Cozzarelli, Fulton, & Sullenberger, 2004; Gadd et al., 2003; 2006; Rowlands et al., 2004b; 2004a, 2005).

Research into open access engagement which has specifically looked at differences between disciplines is somewhat limited. There are only a few studies and many of the disciplines studied have been in the humanities and social sciences. Allen (2005) compared the attitudes and behaviours of researchers from different disciplines in the humanities towards depositing their work in institutional repositories and Kling (2000) attempted to create a theory of how scholarly fields adopt and shape technology in the context of scientific communication. The two other studies have taken an approach of comparing the use of technology across disciplines. Antleman (2006) undertook an online search of self-deposited articles that had been published in six social science disciplines and Talja (2004) looked at how environmental biologists, nursing scientists, historians and literature and culture studies scholars used mailing lists, showing the differential role of formal and informal computer-mediated communication across fields.

Overall in the open access literature there has been little discussion of disciplinary differences as a phenomenon which may determine the engagement of an academic with open access dissemination options. Because of this situation, I will take a slightly unorthodox path and incorporate a brief review of disciplinary differences literature here to inform the design of the research.

Choice of disciplines

The research design builds on a large body of literature looking at disciplinary differences (Becher, 1981, 1994; Fry, 2006; Sparks, 2005; Walsh & Bayma, 1996; Whitley, 1984).

In choosing the three disciplines for this research, Chemistry, Sociology and Computer Science, the initial consideration was for the way the disciplines publish their work. Having separate communication systems is one of the conditions for establishing scientific fields as distinct systems of work. As mentioned in Chapter 3, the others are: "a) scientific reputations need to be socially prestigious and to control access to critical rewards, [and] b) each fields (sic) has to be able to set particular standards of research competence and craft skills" (Whitley, 1984, p. 29). Chemistry, representing a hard science, traditionally publishes in peer-reviewed articles in journals. Sociology, while also publishing in this manner, has an attendant tradition of publishing books or monographs, while Computer Science primarily uses conference proceedings for peer-reviewed communication.

While generally researchers can be described as people who work with ideas, the nature of the particular intellectual tasks on which specific groups are engaged determines to some extent their 'culture'. The divide between disciplines is not limited to the subject being explored. It extends to all aspects of the research endeavour, the language used, the methods of communication and the sources of information, to name a few.

Disciplines themselves are hard to define, but to be admitted to membership of a section of the academic profession "involves not only a sufficient level of technical proficiency in one's intellectual trade but also a proper measure of loyalty to one's collegial group and of adherence to its norms" (Becher & Trowler, 2001, p. 47).

Each of the three disciplines explored in this research can in turn be broken into many sub-disciplines. Chemistry is a heterogenous discipline with several major, distinct subfields, each with different work modes (Walsh & Bayma, 1996). Chemistry is primarily a bench science, meaning of the three disciplines chosen for this work, the chemists were the only group whose work involves sharing some costly component of basic apparatus. In the case of Sociology, due to the structure of the Sociology departments, several anthropologists were included in the interviews. This is a separate discipline altogether,

despite sharing some publication behaviours with Sociology. A general distinction is that sociologists use methodology, as an 'instrument of science', whereas anthropologists experience fieldwork and interpret through cultural meaning (Becher & Trowler, 2001, p. 61).

Using the discipline of Computer Science in this research is complicated by the way the faculties or departments are defined within the institutions attended. At UNSW the School of Computer Science and Engineering is housed in the Faculty of Engineering. The Computer Sciences Laboratory at ANU is housed under the College of Engineering and Computer Science, and the Department of Computer Sciences at ANU is within the Faculty of Engineering and Information Technology. Therefore at both institutions both engineers and scientists are employed under the banner of 'Computer Sciences'. It is important to recognise the clear distinction between engineers and scientists. In very general terms, engineers use knowledge to produce end-items and there is often monetary reward, which is outside the social system of academia. Scientists, however contribute to their field with new knowledge, under a reward system of collegial recognition through publication (Pinelli, 1991).

Another compounding factor in the disciplines chosen was that the ANU has a Research School of Chemistry and a Research School of Information Sciences and Engineering in addition to the Chemistry Department and Computer Science Laboratory. In both disciplines I approached the researchers in the Research Schools and the Departments. In theory, researchers employed within the Research Schools do not have a teaching load so their time is more focused on research. In reality, as the results show, many of the people interviewed under these employment conditions were still heavily involved in teaching.

Publishing norms in the three disciplines chosen

Disciplinary publishing differences extend beyond the output format and include policies towards depositing material into repositories or on websites. Chemistry, for example is a traditional, 'hard' science and its practitioners tend to publish almost exclusively in journals. The restrictive approach to publishing in Chemistry is reflected in the policies of the American Chemical Society (ACS) which has at times tried to ban scholarly electronic publishing (except in the form of society-sponsored electronic versions of existing paper publications) (Kling & McKim, 1999, p. 894). The wording has softened a little since their 1997 statement about electronic publication, but the revised 2004 statement still has a punitive approach. The ACS Editors Policy on Papers on Preprint Server now reads:

> A preprint will be considered as an electronic publication and, according to positions taken by most editors of ACS journals, will not be considered for

> publication. If a submitted paper is later found to have been posted on a preprint server, it will be withdrawn from consideration by the journal (American Chemical Society, 2004).

There is resistance to electronic publication of pre-prints in the European Chemistry community too, with the European Journal of Inorganic Chemistry stating: "Any manuscript already available on personal/group web pages will be considered by the editors as already published and will not be accepted" (Wiley Publishing, 2008).

By comparison, the Association for Computing Machinery's (ACM) copyright policy, states: "Authors must transfer copyright to ACM upon acceptance. Immediately after acceptance, authors must incorporate the ACM copyright notice and ACM citation of the publication into copies they personally maintain on non-ACM servers" (Association of Computing Machinery, 2002). They also expressly provide a copyright licence back to the author. This acknowledges the widespread practice in computer science of researchers maintaining personal copies of their publications on websites. In Computer Science, conference articles are treated as:

> significant forms of publication, and computer science journals are more likely to republish amplified versions of a conference article. In contrast, natural scientists insist that journal articles are the primary form of significant publication, and their best journals do not publish amplified versions of articles that have previously been published in very obscure journals (Kling & McKim, 1999 p. 890).

Computer Science has long had difficulty having its publication structure recognised by university administrations. In 1994, the National Research Council (US) commissioned a report on the academic careers of experimental computer scientists and engineers. Among other conclusions, it stated that: "the committee also found that publication practices in ESCE [Electrical, Computer and Systems Engineering] emphasize conference publication over archival journal publication, a fact likely to be negatively interpreted by the "paper counters" of university promotion and tenure committees" (National Research Council, 1994, p. 60). The report found this 'negative interpretation' had resulted in researchers changing their publication practice: "a large majority of the researchers surveyed also indicated their belief that journals were much more effective in gaining university recognition. Most indicated that the reason for this was that university administrators put more emphasis on journals; very few indicated that journals had higher prestige or greater impact" (p. 63). The status quo has not changed. In 2006 this report was given to me by one Computer Science interviewee who stated that he had also recently given it to

the Pro Vice Chancellor to explain how they publish as a discipline. This is discussed in Chapter 6.

Sociology can be classified as a social science, and while there appears to be no specific policy for the deposit of sociology articles into repositories by the American Sociological Association, the Reprint Permission page does state

> Online use is limited to a secure or password protected server for a maximum of one year; digital rights management (DRM) should be utilized to prevent unauthorized reproduction. Posting for longer than one year requires an additional request and payment of an additional fee[v]

but it is unclear if this refers to the author's version of the article. However, some historical clues may be gained from the policies of another social science. While the American Psychological Association currently demonstrates an acceptance of researcher's wishes to deposit by allowing authors to place a copy of their work onto their own or their employer's website, provided certain conditions are met, including the ambiguous condition that: "APA does not permit archiving with any other non-APA repositories" (American Psychological Association, 2002), this was not always the case. The Association's apparently 'widely publicised' policy in 1996 made the rather alarming statement:

> Authors are instructed not to put their manuscripts on the Internet at any stage (draft, submitted for publication, in press, or published). Authors should be aware that they run a risk of having (a) their papers stolen, altered, or distributed without their permission and, very importantly, (b) an editor regards such papers as previously "published" and not eligible as a submission —a position taken by most APA journal editors (quoted in Kling & McKim, p. 893).

This type of statement may go some way to explaining the wariness of some researchers working in social sciences towards the concept of placing their published material online.

Obtaining the interviews

In Australia any research involving humans is required by law to be approved by a Human Research Ethics Committee, under *The National Statement on Ethical Conduct in Human Research* (2007)[vi]. A human ethics research application for this research design was submitted on 1 June 2006. It was given the protocol number 2006/164 and was approved by the Chair of the Human Research Ethics Committee, Prof Lawrence Cram on 30 June 2006. In keeping with my ethics protocol, every person interviewed filled out a consent

form, indicating their responses would be kept anonymous, that they could withdraw at any time. A copy of this form is attached as Appendix 1.

Once I had determined that I was intending to interview researchers at ANU and UNSW, I arranged a meeting with two people at the UNSW library on the 27 July 2006 about the development of the UNSW repository and how the university was approaching the impending roll-out of the repository. I followed up this meeting with an email asking the best way to approach staff to request their involvement. They indicated that I should initially approach the Research Office and the heads of department.

In order to ascertain the best way to approach the staff in each department, and to obtain any background information that could be helpful to my interviews I sought to meet with each relevant department head at both universities before approaching the staff directly. With the exception of Computer Science at UNSW and Chemistry at ANU where I was unable to make an appointment, these interviews helped me understand the particular pressures on and situations of the researchers in those departments. Appendix 2 has an outline of the process I followed to choose and invite participation in each department.

Preparing the questions

The literature review concluded that there was a gap in the literature, in that, there has been very little attention paid to the holistic view of the researcher and how he or she communicates with all members of his or her working community. It is necessary to establish this view to truly understand a researcher's motivations, and address the underlying reasons for the to-date low uptake of open access dissemination options. The literature review also identified the area of disciplinary differences as an important and neglected area of exploration, and a lack of information about Australian researchers more generally.

This research addresses this gap by asking: "How are the communication practices between researchers affecting the uptake of open access scholarly dissemination in Australia?" The work is focused on the individual scholar as the key to change. Scholars are the catalyst for, and the providers and users of scholarly communication and any change to the scholarly communication system, such as a move to open access, will need to be embraced by the scholarly community.

The purpose of the interviews was to gain a deeper understanding of the academic's motivations behind their publishing and researching decisions than would be possible by a simple written survey. It was also designed to understand how deeply the academic

understood the link between publication and reward in Australia, and the amount of time each academic spends contributing to the journal publication system.

Preparing for the interview

Qualitative interviews require a depth of understanding of the topic that is not achievable without being familiar with the interviewee's perspective (Laudel & Glaser, 2004). In addition to the general information gathering about each discipline, specific work was required to gain better understanding of each interviewee. This is in keeping with good interviewing technique: "Know the interviewee. If at all possible, as it usually is, learn as much as you can about the person to be interviewed." (Bingham & Moore, 1959, p. 65) The email sent to the researchers asking them to participate mentioned that I would be asking for a copy of their publication list, which I did when in email negotiation about the date and time of the interview. These lists gave me several background clues prior to meeting with the interviewees. In some cases the interviewee did not have a publication list available and wrote one in the body of a reply email. Others sent sections of a Word document without any identifiers on it as to what the document was. Several interviewees did not send anything through, although in most cases this was rectified at the time of interview.

This background knowledge allowed me to "move from the hypothetical or abstract to the very concrete by asking questions about relevant aspects of respondents' lives and experience, a particularly fruitful tactic for promoting circumstantially rich descriptions, accounts, and explanations" (Holstein & Gubrium, 1995, p. 77). Because this research is looking at the relationship the researchers have with the scholarly literature, observing the way individuals presented their publications was a helpful way to prepare for the interview. I was able to individually tailor my questions about awareness of open access, copyright or the relationship between publication output and the reward structure based on these pre-interview observations.

When an interview was scheduled, I looked up the interviewee on their university website to see what publicly available information existed about them. If there was an online publication list, I checked to see if any of the papers were linked to an openly accessible version. Because all correspondence has been via email, I had no indication (other than their position in the department) of the interviewee's age. In some cases I had no idea of their sex either. In cases where the university (or the interviewee's personal) web page provided a photograph, this gave me an inkling of what to expect.

In each interview I began by speaking about my research, describing in general terms what I was hoping to achieve with the research, and to give them an idea of the area the

questions would be covering. A transcript of this introductory sequence from one interview, which was fairly typical, is here:

> … I think if you want to make changes to the way people work you need to have an understanding of their current work practices. So that is sort of what I am doing and I'm trying to get a baseline in the interviews I am doing. So the structure of the research is I am interviewing Computer Scientists, Chemists and Sociologists who each have different ways of publishing their work and I am comparing here [UNSW] to the ANU to see if there is an institutional difference. I suspect that there won't be, I suspect that the differences will be across groups rather than between campuses. So that is the way it is all flowing.
>
> So pretty much what I will be asking about is your interaction with the literature both as a reader and as an author. And I am asking most people to start, just to give me some idea, about how you are working at the moment. I know it is different between holiday time and term time, but about how much of your time is spent in teaching and admin and research?

This first question, it should be noted, is not one that appears in the question list below. In many ways it was arbitrary, simply a way to start the exchange with the interviewee, and to give me some indication of how forthcoming they were likely to be, following the advice that questions at the beginning should be simple and 'factual' in content to assist in building rapport (DeLamater, 1982). This technique was one of many used, such as the order of the questions explained next, to elicit the richest information from the interviews.

The order of the questions

The success or otherwise of an interview relies on the rapport the interviewer is able to strike with the interviewee. This will take time regardless of the charisma of the interviewer. The order of the questions asked is vital. The literature suggests that questions about threatening topics should not be placed at the beginning of an interview (DeLamater, 1982). I discovered this in the one pilot interview I conducted (discussed above). Using terminology that is unfamiliar to the interviewee can make them feel embarrassed and possibly hostile to the interviewer.

With this in mind, certain questions posed a challenge. As discussed in Chapter 3, most researchers remain unaware of open access dissemination options. The terms 'open access' and 'institutional repositories' were likely to be unfamiliar to the interviewees. I felt that asking direct questions about open access and institutional repositories early in the interview would be unproductive, a position supported in the literature:

> Ask questions at first that are not likely to cause refusal to answer or to provoke any form of negativism. Begin with questions that the interviewee can and is willing to answer. Cooperation is ensured partly by establishing the habit and attitude of answering. Risk questions that may arouse resentment only as a last resort after related questions have failed to encourage him to volunteer the information (Bingham & Moore, 1959, p. 73).

However asking questions about how people looked for information and whether they had problems accessing material, and how they approached issues like copyright, could not only inform my research, but also give an indication whether the arguments being put forward by open access advocates were likely to resonate with the academic population.

Obviously it was necessary to include questions about awareness of, and feelings towards, open access and institutional repositories. Considering Bingham's (1959) advice:

> Do not ask questions directly until you think the interviewee is ready to give the desired information and to give it accurately. … Much of the desired information will then emerge without resort to direct personal questions which sometimes cause resentment or misunderstanding (p. 72)

I included those questions at the end of the list. This meant if the interviewee was unfamiliar with the terms and answered in the negative, it did not bring the discussion to an uncomfortable halt. In practice, those interviewees familiar with open access had already used the expression in the discussion before we reached that question. This of course, then rendered the later questions unnecessary in that interview.

The other advantage of asking behavioural questions about publishing practice first is there is a distinction between a person's attitude towards a phenomenon and their behaviour towards it. In an interview or survey situation, describing an attitude is open to the risk of 'response bias' where the interviewee altering their responses to give answers they think the interviewer wants to hear (Judd, Smith, & Kidder, 1991, p. 229). Asking an interviewee to describe past behaviour, however is a more concrete request and less open to misinterpretation.

The question with potentially the most fruitful answers was: 'why do you publish?'. In order to elicit the most fulsome responses it was important that by the time this question was asked, the interviewee felt comfortable. Therefore the question appears halfway through the interview, after the discussion about literature searching and some discussion of publication practice. Because I wanted the answers to be broad, I often prefaced the question with a statement like:

> Interviewer – this is quite a broad question and you can answer it however you feel. Why do you publish?

Several people acknowledged the difficulty of the question as this exchange demonstrates:

> Interviewer – OK this is a bit of an odd question so just answer it how you think is appropriate. Why do you publish?
>
> Interviewee - Well I am funded by the public. Well I mean, OK [pause] it is an odd question because there are so many different perspectives to it. And there are multiple reasons.

The area of questioning that was placed right at the end of the interview was about grey literature. This placement was for two main reasons. One was that not all researchers produce grey literature. Some sociologists, for example, do not create data sets as part of their research, so this was not a question that I raised in every interview, unless there was a mention of something earlier to trigger the question. The second reason was that I had indicated that the interview would last for 40 minutes. Generally this time frame was achieved, but in some cases the interviews went longer, and I was aware that prior other engagements may cause the interviewee to stop the interview before we had finished. I felt that of all the areas of questioning, this was probably the one that could be sacrificed if necessary.

It is necessary to remember, in this discussion of the order of questions, that the interviews were semi-structured. I allowed the conversation to dictate the flow of questions. In cases where the interviewee brought up a topic that had been slated for later discussion, I did not stop them to remain 'on track' with a pre-determined order of questions. This is in keeping with principles of 'active interviewing' (Holstein & Gubrium, 1995), and allowed for an easier discussion and possibly richer information. The remainder of this section discusses each of the questions asked.

The rationale behind the questions asked

The information I was hoping to gain from the interviewees fell into nine general categories: background career information, researching behaviour, publishing behaviour, reward processes, copyright, peer review/editorial responsibilities, questions about open access, publishing in repositories and grey literature. I devised several questions for each of these categories. Not every question was asked in every case, the questions served as a guide to the interview process rather than a script.

Within each set of questions I asked a general question first, followed by increasingly specific questions. The most detailed questions were at the end. This questioning technique adheres to the 'funnel' principle (Judd et al., 1991, p. 246).

Interview questions

The full question list is reproduced below.

Category	Questions
Background career information	1. Firstly, please give me an indication of the spilt of your time between teaching, research and administration. 2. Please briefly describe the research you are currently undertaking – what form does that research take (interviews, observation, experiments, computer work).
Researching behaviour	1. How do you keep up with what is happening in your discipline? 2. How do you decide if an article is worth reading? 3. Do you ever hit barriers when collecting information? 4. Are you satisfied with your current access to the literature? 5. What changes in the past 10 years have you noticed in the way you search and your ability to find things? 6. Do you think the ease of access to a paper affects the choice of papers you use for research? OR: Does a barrier mean you change what you are looking for (finding an article that is easy to get hold of that says essentially the same thing?) 7. How do you go about obtaining copies of the articles you need? 8. Do you send out copies of your work to people? 9. What proportion of your information would come from published literature as opposed to grey literature?
Publishing behaviour – journals	1. Why do you publish your work? 2. Please describe any formal instruction you were given about the publishing process. (If there was none, please describe how you found out what you know) 3. Are you involved in any formal or informal mentoring or training process for young researchers to 'show them the publishing ropes'? 4. Could you explain your choice of the journals you have published in? 5. Have you ever been approached by a journal to publish your work? 6. On average, how often are you accepted by the first journal to which you submit? 7. Have you ever submitted to more than two journals (and if so what was the overall time to publication?)

	8. On average, what has been the period of time between submission and publication – do you have an opinion on that?
Reward processes	1. What is your understanding of the relationship between your publication output and funding? 2. How would you feel about the ARC allocating funds to include Open access publishing or would you rather the money be spent on research applications? 3. Do you have an opinion about any changes to reporting requirements by your university/the government?
Copyright	1. What is your understanding of the copyright status of your academic work? 2. Is copyright an issue you consider? Does the copyright status afforded by a journal affect your choice of publication? 3. Are you aware of alternatives to traditional copyright (such as Creative Commons licence or copyleft)
Peer review/editorial responsibilities	1. Have you ever reviewed a paper? 2. If so how many papers would you review in a year? And how much time would this take? 3. Are you on an editorial board of any journals? How much time does this take up? 4. Is this something you sought or that you were asked to do? 5. Have you been compensated in any way for that work? 6. How do you feel about reviewing (is it a positive or a negative task for you and why?) 7. What are your feelings about changing peer review to an open system, in an electronic context for example?
General questions about open access	1. Are you familiar with the term 'open access publishing'? 2. If so, could you describe open access as you understand it? 3. Do you have an opinion either in support or against open access? 4. Have you ever published in an open access journal? 5. Are you familiar with the 'author-pays' or 'pay-on-submission' model? 6. How would you feel about this becoming the standard publishing model for all journals?
Publishing behaviour – repositories	1. What is your understanding of the term 'institutional repository'? 2. Have you ever deposited any scholarly materials, including pre-or post prints into an institutional repository? 3. If not, what about on personal or departmental website? 4. If not why not? Would you consider doing so? What would prevent

	you from doing this? What would encourage you to do this? 5. Have you ever sent out a copy of a pre or post print to colleagues on your own instigation or on request? 6. Are you aware of the deposit permission status of the journals you have published in?
Grey literature	1. Does your research generate any supporting data? 2. What do you do with supporting data for your research? How do you store it? 3. Have you or would you consider placing it into your institutional repository? If so would you put open access status onto it? 4. Have you ever received requests for supporting data? If so how often has this occurred and have you provided the data?

Table 1 - List of questions asked in the interviews

Summary of the interviews

In total, 43 people were interviewed, 20 from UNSW and 23 from ANU. The following table demonstrates how many of the people in each department were approached and how many were eventually interviewed.

Department	Total no of academic staff in department	No. of academic staff (PhD, emeriti and visitors excluded)	Staff interviewed	% of relevant potential interviewees
UNSW Sociology	19	12	5	42%
ANU Sociology	8	8	6	75%
Total Sociology			11	
UNSW Chemistry	25	6	6	24%
ANU Chemistry Department	10	7	1	16%
ANU Research School of Chemistry	22	21	6	33%
Total Chemistry			13	
UNSW Computer Science	94	55	9	16%
ANU Computer Science Laboratory	32	9	4	44%
ANU Research School of Information Sciences and Engineering	27	15	6	40%
Total Computer Science			19	

Table 2 – Numbers of academic staff approached and interviewed in each department

Analysis techniques

All of the interviews with respondents were audio recorded with a minidisk. I also took comprehensive handwritten notes during the interviews, making notes of the time counter from the recorder during the discussion for later reference. These interview notes have been typed up, with reference to the recording when the notes were unclear. This 'clarification' and elaboration' is recommended in the literature (Holstein & Gubrium, 1995). In interviews where my notes were unclear or I had indicated that something was highly relevant, I supplemented my typed up handwritten notes with a partial transcription of the relevant parts of the recording. One example of each category of interview (each discipline at each university, six in total) has been transcribed in full and attached as Appendices 4a-4f to allow readers to see how the questioning was adapted to suit each discipline and indeed each individual. This provision of 'raw' data is suggested by Silverman (Silverman, 2001, p. 69), to allow the reader to separate data from the analysis and is entirely consistent with recommended practice in qualitative research.

The interviews were systematically grouped and descriptions were summarised. This provided a "coherent organizing framework that encapsulates and explains aspects of the social world that respondents portray" (Holstein & Gubrium, 1995, p.79). Then, in order to identify themes within and across the universities and disciplines, each interview was hand-coded using content analysis and coding (Higginbotham, Albrecht, & Connor, 2001, p. 248). This initial coding used a system described by Barbara Chevalier[2], and involves labelling data, looking for categories and simple descriptive coding. The second stage coding, which is structured and conceptual, was undertaken with a mix of NVivo, a qualitative analysis software program, and manually coding quotes. This coding involves moving information into natural groups, looking for patterns/relationships in the code. This in turn allowed for third stage coding where the bigger patterns emerge in the data and the different groups are labelled. In keeping with the grounded theory approach, the analytical codes were self-generated rather than derived from the literature.

The first set of interviews undertaken was with the sociologists at UNSW. I interviewed this group in isolation and then spent some time with my notes from the interviews, conducting a preliminary analysis to ascertain how effective both the questions and their sequence were. This system also allowed me to see early indications of the issues that were more relevant to the broader research question and to make slight modifications to the question list in preparation for the next set of interviews. This is what is expected of active interviews: "active interviewing takes advantage of the growing stockpile of

[2] In a Research Workshop Program called 'Qualitative data analysis and reporting – without software' held at University of Canberra on 7 February 2006.

background knowledge that the interviewer collects in prior interviews to pose concrete questions and explore facets of respondent's circumstances that would not otherwise be probed" (Holstein & Gubrium, 1995, p. 46). These emerging issues identified new reading areas truly grounded in the study, as would be expected (Strauss & Corbin, 1990, p. 53), and these readings then informed the analysis and discussion of this thesis. In particular, information seeking behaviour, disciplinary differences and diffusion of innovations were all important areas of reading that emerged from analysing the interviews.

This complete analysis of early interviews is recommended by Strauss and Corbin (1990, p. 30), as it gives guidance to the later interviews. As the research progressed and the question list became more defined. I was able to interview participants not only from different institutions but also from different disciplines concurrently. I experienced a second shift in approach with the first interview I conducted in the Computer Science department at UNSW. While I had a theoretical understanding that computer scientists publish differently to other sciences (mainly in conference proceedings), I had no personal experience of this. The transcript of that first interview reads very differently to almost every other interview because I was constantly asking supplementary questions to ensure I understood exactly what the interviewee was telling me. The way I approached all the subsequent Computer Science interviews was very different to the approach to the Chemistry and Sociology ones. This reflects the continual coding undertaken in active interviews which "takes places (sic) and unfolds as an integral part of the interview process, not just before-hand or afterwards" (Holstein & Gubrium, 1995, p.56).

This research has followed the general mode of operation in the grounded theory style of analysis described in qualitative study texts (Strauss & Corbin, 1990, p. 30). As the research progressed and the theory developed, the relevance of certain answers in the interviews altered. For example, one area, which did not at the time of interviews seem to be very important, was the information seeking behaviours of the participants. In particular, the search engines, databases and computer programs they used to find literature appears to affect the likelihood of that researcher to engage in searches that will find information stored in institutional repositories. When designing the question list, I did not include a specific question about techniques of searching. I have had to go through the interviews and pull out the detail in those cases where the participant volunteered that information in the general discussion about literature searching.

One consideration of any research project is the issue of ‘saturation’ – the point where the field or area of study has been ‘covered’ in the data collection process. This concept is a difficult one in grounded theory because this type of research “uses iteration and sets no discrete boundary between data collection and analysis, saturation is not always obvious,

even to experienced researchers" (Suddaby, 2006, p. 639). While I experienced this iteration, and each interview opened new ideas and possible areas of analysis, I did find that there was some level of repetition in the attitudes and themes coming from the interviews by the time I came to the end of the interview process. That said, it would be an interesting (separate) experiment to re-interview the first group of sociologists to see if my more informed viewpoint would elicit different responses.

In addition, when I returned to the literature with a more informed perspective, the patterns that were emerging from the interviews were reflected in the new areas of the literature I was exploring, such as information seeking behaviour, disciplinary differences and diffusion of innovations theory. This ability to find the patterns in the literature is described as saturation in some qualitative research texts (Morse & Richards, 2002, pp. 174-175). Of course, some of the answers given by interviewees did not fit the emerging model, and it was important to look at these cases to determine if they could together form their own model or if there were alternative explanations for the differences.

Prior to the study, it was hoped that by interviewing researchers in their own offices there would be some further insights into their work practices or way of thinking by observing their surroundings. This also had the advantage of making the interviewee comfortable and providing privacy, as: "the critical problem in an interview is the establishment of sound working relationships" (Bingham & Moore, 1959, p. 65). In practice, the benefits occurred in unexpected ways. (This is symptomatic of grounded theory!) Many of the interviewees offered to demonstrate certain behaviours rather than describe them, and this was possible because they were at their computers. Some questions were answered only after consultation of either electronic or paper files (in some cases both). On several occasions there was some follow-up material that the interviewee wanted to email to me, and they did so immediately during the interview. Leaving this to memory at a later time may have meant that some of these valuable resources would never have been sent. For various reasons several interviews were conducted in neutral premises such as a meeting room. In these cases, the interviewees were unable to refer to their computers and several commented on this.

Once the main empirical data gathering was complete, a preliminary analysis demonstrated strong themes emerging from the data. In order to establish if these themes were worth pursuing, it was decided at this point in the research to develop a way of triangulating the findings, discussed next.

Triangulation

Triangulation is used in research to help understand a social phenomenon by examining it "under a variety of conditions" (Mathison, 1988, p. 14). In a research project such as this, several triangulation options presented themselves. In designing the research, the number of people who accepted to be interviewed would be limited. An early triangulation option was expanding my sample space to another, different university; originally the plan was to interview people from a non-Group of Eight university as a comparison, discussed below. The difficulty with this was that non-Group of Eight universities are structured very differently from ANU and UNSW. While this would strengthen the findings for any differences between institutions, it would also mean that a direct comparison with the two Australian universities in this study would be challenging and not necessary illuminating.

After discussion with my supervisors it became clear that a more informative comparison would be to undertake a case study of Queensland University of Technology (QUT). QUT was unique in Australia at the time of the interviews in that it had a mandate requiring all researchers to place a copy of the final version of their peer reviewed and corrected papers into QUT ePrints (QUT, 2004). As an example, part of the QUT policy states:

> Material which represents the total publicly available research and scholarly output of the University is to be located in the University's digital or "E print" repository, subject to the exclusions noted. In this way it contributes to a growing international corpus of refereed and other research literature available on line, a process occurring in universities worldwide (QUT, 2004).

This mandatory policy is accompanied by technical and administrative support for depositing researchers from the QUT library. I decided to interview the two people who had instigated and administered the process of implementing this repository.

Interviews were sought on 15 June 2007 and granted with Professor Tom Cochrane, Deputy Vice Chancellor (Technology Information and Learning Support) and Paula Callan, eResearch Access Coordinator from QUT (who undertook the day to day instigation of the repository deposits). The interviews were conducted on 10 & 11 August 2007. Both spoke at length about the reasoning behind the policy and about specific issues faced with populating their repository.

These interviews were structured very differently to those conducted with the academic participants, as the purpose of these interviews was to determine if the general conclusions that seemed to be coming out of the interviews I had conducted so far were reflected in the experiences at QUT when rolling out their repository. Thus, after reading

several reports on the topic (Callan, 2006a; Cochrane & Callan, 2007) the following discussion areas were explored.

The interview with Paula Callan was wide-ranging, beginning with a potted history of the repository from its launch and a discussion of her role in the implementation of the repository. Some time was spent discussing the techniques used to encourage use of the repository, and the success or otherwise of these methods. This led to a discussion about the barriers individuals were experiencing in using the repository, and therefore the reasons researchers are giving for not using the repository. The interview also encompassed a series of statistical questions about the percentage of output of the university that is held in the repository, and download statistics.

The interview with Professor Cochrane began with a discussion of the adoption of a mandate policy at QUT in 2004. The interview then explored the discipline issue, such as why a planned discipline-led approach to building repositories did not work, which disciplines have shown greatest enthusiasm for the repository, and whether this was expected. The issue of whether there is greater benefit to the institution or the individual in using a repository was discussed. The interview concluded with questions about the roll-out of the repository, the decision to 'sell' the repository to staff rather than punish those who do not use it, and what barriers are being experienced by QUT with this approach. A discussion of how these interviews have informed this research is discussed in Chapter 6.

The last section of this chapter will explore the various limitations of the chosen research design.

Limitations in this study design

The limitations in this study are several-fold. Most obviously, the choice of universities and of the disciplines approached to be involved has limited the scope of the study. In addition, the self-selecting nature of the method of participant recruitment shows limitations.

Choice of institutions

To look at the issue of the university choice first, there is a limited 'generalisability' in these findings - what would appear to be the case from observations of these two universities may not be transferable to other universities in Australia, let alone the world.

This research focused on two Group of Eight[vii] universities. The 'Group of Eight' (Go8) is a term given to a self-selected group of eight universities in Australia that 'represents

Australia's leading universities'. Equivalent expressions are 'Ivy League' universities in the US, and 'Oxbridge' in the UK. The Go8 in Australia consists of: ANU, the University of Sydney, UNSW, the University of Melbourne, the University of Queensland, the University of Adelaide, the University of Western Australia and Monash University. As members of the Go8, both ANU and UNSW are well funded with a high research output in terms of publications, and therefore do not represent the range of academic environments in Australia.

The Go8 is only one of four main groupings of Australian universities. These groupings are all self-selected and have been formed primarily to promote the mutual objectives of the member universities. These groupings offer marketing advantages, practical benefits of collaboration, and the increased lobbying power that comes from being part of a group. The other three groups are the Australian Technology Network (ATN)[viii], Innovative Research Universities Australia (IRU Australia)[ix] and New Generation Universities (NGU). Not every university in Australia is represented in one of these groups. Of these other groups, the one of most interest to this research is the Australian Technology Network, because it includes QUT, which was used in this study as a university with which to triangulate. Together with the other members, Curtin University of Technology, the University of South Australia, RMIT University and University of Technology Sydney, QUT shares a common focus on the practical application of tertiary studies and research. The ATN universities were all Institutes of Technology before becoming accredited universities.

Any further study in this area would benefit from taking a broader approach to the institutions chosen, as the empirical work found institutional differences did not appear to be a factor in this research. One of the few studies looking at institutional differences in this context has found that the information seeking behaviour of members of the university community changes depending on the focus of the university (Nicholas, Huntington, & Jamali, 2007). That study compared a Research Intensive University, a Master's University Medium Size, Research Extensive University and a Master's University Small. The differences tended to be due to the number of academic staff at the university, so a subsequent specific study of the academic communities at different universities would reveal whether the institution itself has an effect on the information seeking behaviours of the academic staff.

The question remains, is this a phenomenon of the particular universities chosen, or is it representative of the wider academic institutional community? As an a example of how broadening the university base would make further study more robust, IRU Australia has a stated aim to incorporate new technologies into their teaching and learning, so it is

possible to argue that including a university from this group could provide an interesting counterpoint to the universities studied. In addition, there are many organisations in Australia falling outside of the university category which have staff undertaking research and publication could provide insight into how different organisational structures affect publication behaviour and decision-making.

Choice of disciplines

Another limitation of this study is the disciplines highlighted in the study. It is important to consider when reading the forthcoming chapters that while this study shows clear differences between the three disciplines of Sociology, Chemistry and Computer Science, that the extent of these differences cannot be assumed between other disciplines. While it is likely that the behaviour of researchers in other social science disciplines will be more closely aligned to those of the sociologists interviewed than to Chemistry or Computer Science, this cannot be assumed. It is equally possible that the large differences demonstrated between disciplines in this study are replicated between all disciplines and, therefore, it is not possible to make generalisations about types of research. This conundrum will only be able to be addressed by a more comprehensive study comparing a larger and different set of disciplines.

Individual subjects

The final limiting factor is the individuals who elected to be interviewed. Because no pressure was placed on individuals to participate, those people who chose to participate in the study are, in effect, self-selecting. While the study design determined which disciplines would be approached, it was a matter for the individuals invited to decide to participate. Table 1 indicates that between 56% and 84% chose not to be involved and it is possible that their responses may have differed significantly from those offered by the people who did choose to participate. Certainly there was a percentage of people interviewed who had a vested interest in the area of scholarly communication, either because they were the editor of an open access journal they were involved in the implementation of the RQF in their department or for personal reasons. These people may not be a general reflection of their colleague's awareness of, or attitudes to, the issues discussed. Unfortunately, this limitation is one that is not easily addressed, and any further similar study will be affected by the same problem.

Within disciplines, a broader scope could also be taken in any future study. Due to the small numbers interviewed in each discipline, consideration was not given in this study to age, or career trajectory. PhD students were deliberately excluded from this sample. Their attitudes and understanding of the publishing system could, however provide some

insight into the future direction academia might take. In addition, their searching systems are more likely to demonstrate an electronic bias, which could provide some data to make conclusions about the body of work being used currently, and whether having papers available online does provide an advantage. Any further study could benefit from making a comparison between researchers whose training was before the advent of computers and younger researchers who have only ever used the electronic library.

A final note about potential limitations with this study. An ethical consideration in research involving humans is whether the research would have an impact on the subjects. While this question was answered in the negative in the ethics application, it did open one previously unconsidered line of thinking. By discussing open access and their institutional repositories with participants, I would, in many cases, be playing an informing role. While every attempt could be made to remain objective, the act of the interview could still be perceived to be taking an advocacy role, certainly if the subjects asked questions and wanted further detail (which a few did).

Summary

In keeping with the general 'open access' philosophy, I offered every participant the opportunity to remain informed of any publications or findings that have resulted from this research. Without exception they asked to be included. In fulfilment of this obligation, I presented a talk to UNSW on 13 April 2007, which was well attended. I have placed the overheads and recording into ANU's institutional repository Demetrius[x]. I also sent an email on 18 October 2007 to every participant who asked for feedback with a list of all my publications to date.

Several participants have remained in contact, with some emailing information requests as they have come across the issue in their work environment. Others appear to have taken a proprietary role in my research, sending suggested readings as they have come to hand.

Possible outcomes from study design

It is helpful before embarking on a study to consider the way some of the outcomes may present themselves, and a short summary of my thinking before interviewing is listed here. Stratifying the sample of researchers by dividing the population up into sub-populations means the study is looking at six groups in total. The risk is that the stratification means the number in each strata becomes so small that the results would be statistically insignificant. That said, this is a qualitative study, not a quantitative one and

there are several advantages to using a range of disciplines with different publishing emphases.

A convergence of some responses across all groups would mean it would be possible to make an argument that these attitudes or behaviours represent the Australian perspective. If however the responses demonstrate a difference between the two institutions, but a similarity across the disciplines, it could be argued that these represent the attitudes and behaviours of the university in question. Similarly, those responses that differ from discipline to discipline within an institution, but converge across the institutions could represent a disciplinary difference.

If a strong difference manifested in one of the six groups, such as one group showing a high level of understanding and acceptance of open access, the next step would be to find out what makes that group unique amongst the six, and then determine if the differing factor can be applied in some way across the board. It is also possible that all or most respondents show a similarity in their attitudes and behaviours to a level where there is little distinction between the discipline or institution. This would in itself be an interesting finding, offering the tempting possibility of a 'one-size-fits-all' solution to the problems facing Australian uptake of the new publishing systems.

As will be discussed in Chapter 8, only one of these possible scenarios occurred, but it turned out to be a far richer vein than initially anticipated. The next two chapters will discuss these interviews in detail.

[i] Website: http://www.anu.edu.au/graduate/scu/ accessed 29 September 2008

[ii] Website: http://www.apsr.edu.au accessed 29 September 2008

[iii] Website: http://dspace.anu.edu.au/ accessed 19 September 2008

[iv] Website: http://arrow.unsw.edu.au/vital/access/manager/Index accessed 19 September 2008

[v] Website:

http://www.asanet.org/cs/root/leftnav/publications/reprint_permissions accessed 19 September 2008

[vi] Website: http://www.nhmrc.gov.au/publications/synopses/e35syn.htm accessed 29 September 2008

[vii] Website: http://www.go8.edu.au/ accessed 19 September 2008

[viii] Website: http://www.atn.edu.au/ accessed 19 September 2008

[ix] Website: http://www.irua.edu.au/ accessed 19 September 2008

[x] Website: http://dspace.anu.edu.au/handle/1885/45159 accessed 19 September 2008