

# eResearch practices, barriers and needs for support: Preliminary study findings from four NSW universities

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## ABSTRACT

This paper will present initial findings from a survey that investigates existing technology-enhanced research practices, researchers' readiness to adopt eResearch, their needs and major barriers. The study was conducted as a part of a larger project which aims to establish researchers' requirements for eResearch infrastructures and support, build researchers' awareness about eResearch potential, and engage with them to co-develop eResearch services. Preliminary results indicate a gap between researchers' positive dispositions, willingness and obvious need to adopt new technology-enhanced research practices and their limited awareness and utilisation of eResearch and eResearch bodies. By offering some key preliminary findings in this presentation we have two aims: a) to shed some light into current researcher technology-enhanced practices, needs and constraints; and b) to open a discussion about the importance of taking these practices seriously when developing new research infrastructures and services. We argue that lack of awareness of researchers' needs and limited engagement with researchers in co-development of infrastructures may not only disenfranchise many researchers, but may also actively discourage short- and long-term uptake of eResearch technologies.

## BACKGROUND AND RATIONALE

Over the last decade, individual universities and governments in various countries, including Australia, have made significant commitments and investments in developing advanced technological infrastructures to support research – in short, eResearch [1, 2]. These investments have been fuelled by an explicit expectation that eResearch infrastructures will be taken up by broader research communities and will enhance the nature, quality and efficiency of research. Nevertheless users and developers of eResearch infrastructures and services face numerous challenges embracing and scaling up eResearch [3-5]. While some of these challenges might be technical, others are likely to be social, cultural and epistemic, but in any case none of them are explored or well understood. In a consultative study for the Economic and Social Research Council, Steve Woolgar argued:

“Despite the enormous unfolding investment in e.g. grid technologies, it seems we know almost nothing about how and why (and by whom) these new technologies will be taken up, nor what will be the likely effects on the nature and conduct of e-Science and e-Social Science research. The need for attention to these questions is urgent because the initial current investments are establishing systems that will remain in place for some time to come.” [6:2].

In order to improve eResearch uptake and maximise the benefits of research infrastructure, we need to understand existing research and technology practices; what motivates researchers to go beyond traditional research approaches; and what prevents them from adopting eResearch. In this study we aimed to investigate the role of technologies in current research practices, what kinds of challenges researchers typically face, and what kinds of eResearch solutions and support could be most beneficial for them.

## APPROACH AND PROCEDURE

This study was conducted using an online survey which covered three main eResearch areas: a) data management, retention and sharing; b) technology-enhanced research methods, tools and services; and c) research collaboration and dissemination. The questions focused on four aspects: a) present practices and barriers for eResearch; b) attitudes, and awareness about eResearch; c) priorities and requirements for new infrastructures, services and support; and d) researchers' willingness to be involved in future elicitation of needs and specification of requirements. In total, participants were asked to respond to 40 questions, most of which required them to choose from a range of options and allowed a short comment, while eight questions asked participants to provide open narrative answers.

The online survey was conducted in May–June 2009 at four NSW universities: the Universities of Sydney, Newcastle, New England and New South Wales. Email invitations were initially distributed via Deputy Vice-Chancellors Research inviting all academic staff, research students and research support staff to participate. Further invitations and reminders were sent directly to some interest groups, centres and faculties within universities. The invitation clearly stated that “We are interested in your research practices and opinions, whatever your discipline, and whatever the extent of ICT use in your research”, thus targeting both researchers who may be new to eResearch and existing users. After the survey was closed, multiple-choice answers were analysed using statistical analysis, while written answers were categorised and further explored for common patterns.

## INITIAL FINDINGS

Results presented in this abstract are preliminary, based on findings after initial technical data analysis of data. By the time the paper is presented detailed and analysed results will be available. In total 658 participants took the survey and

537 (82%) of them completed it to the end. About 26% respondents were from University of Sydney; 16% – from Newcastle, 17% – from New England, 29% – from UNSW, and 12% – indicated other institutions or skipped this question. About 23% of survey participants were postgraduate students, 68% academic staff and 8% others, typically research administration staff. Disciplines were all well represented, with Medical and Health Sciences a clear leader (24%). Below are some selected preliminary results that present a snapshot of the situation.

**Data management, retention and sharing.** About 50% of respondents said that 81–100% of their research data is in digital format. However asked how they disseminate research findings, the overwhelming majority of respondents (79%) still use conventional publishing (journals, books, proceedings). About 54% did not have an explicit research data management plan and 15% didn't know whether they had one. Asked "Do you face any data management or preservation issues?", 43% said yes and 20% didn't know. Of those who allow researchers outside their team to access their research data (48%), the overwhelming majority (73%) privately negotiated such access.

**Research methods and tools.** More than 75% participants indicated that they use spreadsheets, databases and statistical software for data handling and analysis; 47% indicated that they used software specifically developed for their data; but very few used data and computation intensive methods, such as data mining (15%) or voice recognition (22%). In contrast, asked which digital methods they don't use, but would had they support, participants nominated such methods as modelling and simulation, data mining, and voice recognition and transcription software, among others.

**Research collaboration and dissemination.** Only about 8% are not involved in collaborative research. Most collaboration occurs within the research group (70%) and with other universities (50%). The favoured current technology often used for collaboration is still overwhelmingly email (94%), with face-to-face meetings running at 61%. Video conferencing is only used often by 13% of respondents, and virtual research environments and project management tools used very little (1% and 4% respectively), though these along with institutional repositories are all frequently identified as areas that would benefit from institutional or ICT support, amongst many other suggestions.

**Awareness and attitudes.** Only less than half (43%) of the researchers who responded to the survey had heard the term 'eResearch' before the survey. Nevertheless more than 70% stated that eResearch is important or very important for future progress in their research fields. More than 43% indicated that they face data-management or preservation issues, and about 29% stated that present ICT support only minimally or not at all matches their research needs. Only 7–26% of respondents had heard about or used services provided by Australian eResearch bodies, such as ANDS, ARCS, NCI, Intersect, or NCRIS. In contrast, more than 30% of respondents indicated that they would be willing to participate in follow-up focus groups and discussions aimed at developing eResearch services and support; over 59% wanted to receive a brief report of the survey; and 60% wanted to receive information about eResearch activities from their university.

## CONCLUSIONS

The results reported here are snapshots of the current situation based on the responses of self-selected participants from four universities in NSW. While results cannot be generalised, they are indicative of existing attitudes and practices across different disciplines. These results indicate that eResearch development is not only a technical, but also a social challenge. They point to a significant interest in eResearch, but a lack of awareness and minimal engagement between eResearch service providers and researchers. In many ways the survey itself contributes towards the important task of opening eResearch to a broader research community. As one respondent commented, "(the) survey gave me an idea of what software may be available that I hadn't even considered using or even knew of - eg. audio analysis - what is that! Would like to know more."

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