73. **Rethinking the scholar: openness, digital technology and changing practices**

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Overview

This presentation discussed the current landscape on scientific publication, and the route from 'analogue' to digital scholarship (Borgman, 2007; Holliman et al., 2009; Weller, 2011). The Digital Scholarship project was used to reflect on potential changes to academic practice.

Traditional routes to publication are well known. Primary literature is about establishing priority, including printed text (Montgomery, 2009), and the peer review process (Wager, 2009) and tends to be searched by indexes (Gartner, 2009). 'Alternative' routes to publication have emerged including pre-print servers (e.g. arXiv), open access journals, open review (e.g. JiME), open repositories (e.g. ORO), popular science books, or 'festschriften'. Other sets of communication opportunities include press conferences, and news and current affairs media, with further possible forms of publication including 'secondary' and 'grey' literature, email and online forums, social media and networking, podcasts, audio downloads and web video. Figures in this landscape of publication include academic journals, scientific institutions, 'big science' projects, higher education institutions, industry, news media, magazines, NGOs and scientific citizens.

'Analogue' towards digital scholarship

The American Council of Learned Societies Commission on Cyber-infrastructure for the Humanities and Social Sciences defines digital scholarship as creating collections and the tools to use them and comments that while it is surprising that these should be counted as scholarship, 'research has always required collections of appropriate information, and throughout history, scholars have often been the ones to assemble those collections, as part of their scholarship.'

Unsworth (2000), again focusing on the tools that scholars need in the digital age, describes seven scholarly primitives or some basic functions common to scholarly activity across disciplines, over time that such tools would need to support. He describes these as discovering, annotating, comparing, referring, sampling, illustrating and representing and discussed the ways in which computers could support these activities. Digital information is efficiently stored, searched for, and retrieved. It facilitates digital archives, curation and informatics. The research process makes use of digital scholarship, includes requirement for training (e.g. in information literacy). It enables the use of automated and personalised updates on funding calls, facilitates searching for collaborators, electronic submission and review. What do these possibilities mean for the activities of contemporary digital scholars?

Cozzini (2008) discusses how the American term cyber-infrastructure used in the Borgman et al. report (2008) is equivalent to the European e-infrastructure and goes on to discuss

the contemporary prospects for e-Science. These were first introduced in United Kingdom by John Taylor, then Director General of the Office of Science and Technology in the U.K as follows:

> *In the future, e-Science will refer to the large scale science that will increasingly be carried out through distributed global collaborations enabled by the Internet. Typically, a feature of such collaborative scientific enterprises is that they will require access to very large data collections, very large scale computing resources and high performance visualization….*"

As a practising e-scientist Cozzini has a good perspective on the reality surrounding this vision of the future He writes (p.2)

> "*Many national and international projects around the world are now carrying out research and innovation activities that transform the vision of e-science/ e-infrastructure and Grid computing into reality. The first waves of such initiatives came mainly from the natural sciences, where large volumes of data are involved in research and modern simulation approaches require huge amount of raw computing power. High energy physics, astronomy, meteorology, and computational biology are just a few areas where the new paradigm has been applied with considerable success.* (….)

"Scholarship Reconsidered" was produced by Boyer in 1990 reflecting on higher education; he developed an extended notion of what it means to be a scholar. He identified four functions of scholarship: discovery, integration, application, and teaching. Pearce (2010) identifies for each of these functions a changed set of practices, Open data, Open publishing, Open engagement and Open education. These changing set of practices were investigated in an Open University project exploring digital scholarship (Pearce et al. 2010).

The Digital Scholarship (DISCO) project conducted at the Open University 2009-10, interviewing 22 academics in higher education about their teaching communication and publication practices. The interviews took 40-60 minutes. They were semi-structured with a set of questions to investigate how new technologies available to academics were being used and how this was influencing their scholarly practices. Either face to face, telephone or Skype were used. A number of themes were identified which are reflected on below: openness, engagement

Reflection

The impulse towards openness is an important part of the changed landscape for the digital scholar. Burton has described the open scholar as "*someone who makes their intellectual projects and processes digitally visible and who invites and encourages ongoing criticism of their work and secondary uses of any or all parts of it--at any stage of its development*" (http://www.academicevolution.com/2009/08/the-open-scholar.html). Although the interviewees recognised some of this impulse, many had reservations about working in such an open fashion.

Some interviewees described their use of open educational practices. McAndrew, Scanlon and Clow (2010) argue that it is not just the research landscape for academics is changed but also that of their teaching practices. It is not only the academic who is potentially who changed here but also the learner: '*The idea that learning is less about transmission, or in-*

deed less about knowledge, and rather about how to operate at personal and society levels has resonances in the current striking change in learning environments. In these emerging more-open environments the user gains the ability to personalize educational resources in the widest sense. When this personalization is combined with social networking enabled by technology, the learner can start to set a customized learning agenda.'

Philips (2011) and Poliakoff and Webb (2007) have discussed the dialogic turn in research practices and the implications of this for public engagement. The interviewees were reflective about the ways in which communicating online had changed their practices, in terms of networking with potential collaborators to developing activities engaging the public using blogs.

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74. Walking the ethical tightrope between science and policy: responsible communication of scientific research to policy-makers

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Introduction

There is increasing recognition that policy-makers need to be provided with the latest and best scientific evidence to ensure policy is better informed. However the dialogue between science and policy is not straightforward, nor free of conflict (JRC and AAAS, 2010). Researchers may feel a lack of reception from policy-makers for their work, whilst policy-makers may fail to identify relevance in research unless it is highlighted for them (Stone, 2002). This emphasises the importance of good communication and the role of knowledge brokers in this field (Holmes & Clarke, 2008).

Science for Environment Policy (SfEP) is a weekly electronic news alert targeted at policy-makers across the EU. It disseminates environmental research to 14,000 subscribers and is financially supported by the European Commission. The project has recently expanded to include two new publications that cover emerging, multi-disciplinary and sometimes controversial areas of research such as Biodiversity and Health, Plastic Waste and Green Infrastructure. As such, they require communication of research that is accessible to policy-makers but also faithful to its scientific roots.

An action research project was initiated to develop these multifaceted publications and explore the process of responsible science communication to policy-makers .The metaphor of an 'ethical tightrope' is used to describe the experience science communicators can face when finding the balance between communicating research in a format that will have an impact on policy, whilst maintaining its scientific objectivity and meticulousness.

The research used the new SfEP publications as a platform to conduct in-depth interviews with both scientists (n = 6) and EU policy-makers from DG Environment (n = 6). Participants were asked about the use of research in policy-making, the qualities that make research valuable to policy and the advantages and disadvantages of using a professional science communication service.

Results

Policy-makers appear to use research at several stages of policy-making from informing new policy (e.g. green papers, communications, etc.) to supporting the implementation of existing policy (e.g. technical guidelines for Member States) (Davenport et al. 2010). To some extent this agrees with the European Environmental Agency's (EEA) framework of research in the policy cycle (see Figure 1), which proposes research is used in issue framing, ex-ante impact assessment, policy development, implementation and ex-post evaluation. However, unlike the EEA framework, the responses in this study suggest that research is rarely used in the