



The impact of digital technology on postgraduate supervision

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There is a need to improve supervision of higher degree students to increase completion rates, reduce attrition and improve quality. This discussion paper explores the contribution that technology can make to higher degree research supervision. It focuses on research studies that support supervision through the application of digital technology. In reviewing current research, I discuss whether web-based tools can influence the training of Higher Degree Research (HDR) students, are effective in supporting students, and can reduce breakdowns in supervisory relationships. A major trend in higher education is the re-purposing of Web 2.0 systems, not only to access knowledge collaboratively, but also to create and sustain communities of learners. In critically reviewing current research-based papers, I was able to assess the impact of web-based tools on the training and support of doctoral students. The longer-term aim of this research project is to create a digital platform that can assist postgraduate students and their supervisors.

Keywords: higher degree research supervision, Web 2.0 systems, supervisors.

Background to the supervision project

Addressing high attrition rates among HDR students (more than 25%) and the quality of research undertaken by such students are areas of great concern to many universities (Norton, 2012). In response, supervision has moved from an individual relationship to a team approach, leading to a reduction in independent research and providing access to a range of supervisors with various forms of expertise (Green and Bowden, 2012). Redirection from a product-oriented thesis to a process-oriented one; and from a person-centred to a community-centred method has revolutionised many universities approach to providing higher degree education (Stubb et al., 2012). These modifications may instigate changes in the pedagogy of supervision, heighten critical thinking about research questions, and enhance positive relationships with supervisors (Lee, 2008). According to Hammond et al. (2010), using technology as a tool in supervision can transform the character of higher degree training and raise the research outcomes for Australian universities. Therefore, using technology should be able to boost completion rates and reduce the time taken to complete degrees (Hammond, Ryland, Tennant, & Boud 2010).

One of the reasons for looking toward technology to solve Australian universities' research problems is that digital environments are already changing the way people interact (Danby & Lee, 2012). Students, whether undergraduate or postgraduate, are demanding greater flexibility in the way that they study. They want their supervisors to be available 24/7 and to respond to their texts/emails, etc. There is also more remote and distance learning among postgraduate students, which exacerbates the need for communication that bridges the geographical gap. These burgeoning needs can be mediated by software that takes advantage of common computer literacies and is accessible regardless of the choice of device.

With this background in mind, the current paper examines the literature regarding how technology can support the supervision of HDR students. The literature presented will provide a starting point for collegial discussion, which aimed at developing criteria appropriate for designing a web-based supervision platform. The overall outcome of this process is to inform a larger project to design a comprehensive communication platform for supervisors and their HDR students.

Literature search

To investigate the research that is currently available about how technology is used in the supervision process, empirical research articles were identified on that topic based on these methods. The

academic referencing system Sente 6 was used to search the following databases: ScienceDirect, Editlib, ERIC, Academic Onfile ProQuest and SAGE Journals. This yielded limited results so the keywords were expanded to include pedagogical concepts, like 'face-to-face training', 'reflective practice' and 'distance education', 'doctoral student training', 'doctoral process' and 'doctoral education'. Results from this second stage search numbered in the several thousands. Then a restricted time period was used to recognize how technology changes rapidly: 2006 – 2013. The search focused on the Web browser as a participation platform for which software applications are built. From several thousand, the final set of articles comprised 196 Peer reviewed papers, 64 Conference Proceedings, 8 Dissertations, and 16 Reports. When using the filter concepts related to technology, supervision and pedagogical supervision, and supervisor–supervisee relationships, a final set of 18 papers considered most relevant to this project was selected.

Findings

The literature review revealed a clear shift towards participatory pedagogy with the supervision relationship becoming more reciprocal and less hierarchical (e.g., Andrew, 2012; Fenge, 2012). While research regarding HDR supervision is comprehensive, there appears to be limited investigation into the role of technology within supervisory relationships. Nevertheless, several large-scale national studies, such as the United Kingdom's *Researchers of Tomorrow* (Carpenter, et al., 2010; Carpenter et al., 2011; Carpenter, 2012) and the Grattan Institute's *Mapping Australian Higher Education* (Norton, 2012), concluded that in general supervisor's competency with regard to technology was substantially lagging behind that of their students.

A major impetus for using Web 2.0 technologies was to initiate doctoral students into scholarly communities where the highly interactive relationships and focused on more a participatory pedagogy (Danby, & Lee (2012). Using collaborative-based technology, such as 'Google docs', delivered a sense of connectedness that promoted social and academic outcomes. However, not all the studies revealed that supervision was moving towards a more participatory pedagogy (Halse (2011). In some, the relationships did not change as a result of using technology: the supervisor still maintained the role of advisor and mentor and provided support and quality control, but with the advantage of better communication (de Beer, & Mason (2009). However, in most countries there is mounting pressure to implement a more open and flexible type of supervision (Stelma (2011).

The technology used in these studies varied considerably and included the following: Skype, Elluminate, Wimba, Second Life, telephone, and MSN messenger in distance education; Wikis, Microblogging, Social Bookmarking and email; ePortfolio (PebblePad) and an in-house virtual portfolio as a dialog tool; Microsoft Office 365 (Share-Point and OneNote for collaborative writing, Yammer for collaborative ideas and Lync/Skype for communication) and WebCT in more traditional supervision. Two crucial studies were extremely salient because they created completely new web 2.0 technology environments: *Doctoralnet* (Danby, & Lee, 2012) and *Form@doct* (Melingre, Serres, Sainsot, Men, 2013). These environments enabled doctoral candidates who were geographically isolated to collaborate with their supervisors and other doctoral students. The use web 2.0 technology facilitated discussions, videoconferencing, linked homepages, and collaboration in writing spaces (Danby, & Lee, 2012). In particular, Danby & Lee identify the synergy between technology and pedagogy in relation to achieving supervisory goals.

It was apparent that digital tools enabled greater dialogue and interaction between the students and their supervisors (de Beer & Mason, 2009; Cumming, 2010; Carpenter, 2012). Moreover, students generally desired more web-based communication and support from their supervisors (Rockinson-Szapkiw, 2011). The digital environments created virtual spaces that combined technology and pedagogy into a process where research projects could be developed in a more collegial and collaborative way (Le, 2012). Through combining supervision pedagogy with new technologies, these research projects reflected a shift to a process of creating communities of scholars. In one study focusing on Generation Y doctoral students who used Web 2.0 technologies, most participants confirmed that their supervisors were not very interested or competent in new Web technology applications and continued to supervise in a traditional manner (Carpenter, Tanner, Smith, & Goodman, 2011). There was no strong synergy between students and supervisors in spite of the opportunities to use social learning technologies. Apparently their supervisors' knowledge and competency in using technology for the advancement of the process was lagging behind that of their

students. Other pedagogies involved collaborative processes through using either ePortfolio as a resource (Le, 2012) and communication tool or collaborative Website workspace (Rockinson-Szapkiw, 2011).

Conclusion

This literature review identified the need for an iterative process based on scholarly conversations about supervision pedagogy. In particular, such discussions need to focus on two paradigms in order to design a comprehensive web-based supervisory communication platform. The two paradigms that emerged were: technological and pedagogical. It was apparent from the literature that there was a necessity to redefine these concepts in terms of a united digital pedagogy, because one term in isolation was not sufficient for success without the other. Social media is essential to create a sustainable community for students and their supervisors in the future. It is clear that current students are demanding greater use of technology and want their supervisors to become competent in the use of it to make their relationships more flexible and interactive.

A digital pedagogy model that brings about these multidimensional changes using a social media application could help to create the next generation of supervision pedagogy. Ideally it would develop a more participatory relationship to shift supervision from an intense personal relationship to a more professional one. A technological tool to assist in implementing this vision is only a first step in providing the foundation for a sustainable bridge between technology and supervision pedagogy. Critically, further empirical studies are needed. Such research, in focussing on the multidimensionality of contemporary supervision, is likely to contribute to the recognition of doctoral supervision as a field of scholarly work.

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