Postgraduate research supervision: a critical review of current practice

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Changes in the funding and delivery of research programmes at the university level have, in recent years, resulted in significant changes to research supervision. This paper critically reviews key influences effecting postgraduate supervision. Analysis draws on literature spanning 2000–2010 to determine the appropriateness of traditional models of postgraduate research curricula and supervision for the New Zealand context. Influences discussed include the research context, faculty issues, supervision pedagogy and models of supervision. Each area is analysed for strengths and challenges and contribution to the knowledge economy. From this review, the authors propose strategies for the development of postgraduate research supervision: faculty development, including supervisor education, and formalised research training for students.

Keywords: postgraduate supervision; doctoral supervision; doctoral research supervision; supervision pedagogy

Introduction

Research supervision has changed significantly in recent years. Widespread changes have caused governments to scrutinise the purpose of higher education and the attributes and capabilities research graduates have for the workplace. Australian and European researchers have noted that workplaces require a highly skilled workforce with technological skills, applied knowledge and the competency to contribute to the knowledge economy (Barnacle 2005; Ellis 2006; Kehm 2007; Walker and Thomson 2010). Workplace demands have influenced research education at a time when educational policy and research funding have changed, with universities becoming more accountable to governments for the production and quality of their research outputs (Harland 2010; Scott et al. 2004). This means that universities have multiple responsibilities to respond to workplace needs, to engage in capability building (with staff and students) and to establish specific research platforms that take into account external environment funding contestability. Overall, the political and economic factors that influence research across Australia and Europe are very different to the professional and epistemological issues that traditionally shaped postgraduate research and how it was supervised (Barnacle 2005; Craswell 2007; Enders 2005; St. George 2006; Walker and Thomson 2010). As a result, research degree programmes in the higher education market have expanded and research supervision has had to change.

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Supervision today is about integrating research management and support systems for a diverse national and international student population (Rodwell and Neumann 2008). These factors impact the institutions offering research degrees, the students seeking research education and the supervisors managing complex issues in a contestable funding environment (Green and Usher 2003; Manathunga 2005a; Sampson and Comer 2010). In this paper, key issues influencing postgraduate supervision in New Zealand, including the research context, faculty issues, supervision pedagogy and models of supervision, are analysed. Strategies for improvement are proposed.

The research context

For some time now, there has been an increased interest in postgraduate research supervision and research education success. Completion times have extended and government funding has decreased, while institutional competition for students has increased (St. George 2006). Taylor and Beasley (2005) reported that only 50% of doctoral students complete and very few do so in the specified time frame. Problems with timely completion are well documented around the world (Green and Usher 2003; Neumann 2005; Rodwell and Neumann 2008). Debates surrounding this issue have focused on supervisory processes (Gill and Bernard 2008; Golde 2010; Ives and Rowley 2005; Nulty, Kiley, and Meyers 2009; Pearson and Brew 2002; Price and Money 2002) and student and institutional factors (Manathunga 2005a). More recently, the debate has moved onto supervision pedagogy and recognising research teaching as a sophisticated skill (Golde 2010; Grant 2010; Walker 2010). Each of these issues will be discussed in the course of this review.

The ongoing problems with successful completion have highlighted critical questions about traditional approaches to research education (Enders 2005; Green and Usher 2003; St. George 2006). Universities have been challenged to examine systems and processes, admissions, availability of research programmes, resource issues and the academics who manage the process. Systems and processes have certainly changed, although the academics managing the process may not have. Essentially, the notion that one size of supervision fits all is limited in the current context.

One of the main contextual changes is that government higher education priorities have altered and affected university research funding. Funding changes have an indirect impact on how supervision is managed. For example, in New Zealand, postgraduate research students have increased although the number of supervisors has not changed (Gerristen 2008; Sampson and Comer 2010) and funding in the tertiary sector has tightened (St. George 2006). Part of the problem in New Zealand at least is that university research funding is competitive and influenced by the Performance Based Research Funding (PBRF) model, which aims to foster and reward excellent research (Tertiary Education Commission 2006). Fifteen percent of the PBRF allocation is allocated for external research income, 60% is determined on the quality of an academic's research outputs and 25% of university research funding is allocated to postgraduate research completion. While the funding for research completion is not time-limited, PhD funding is restricted to 4 years (Sampson and Comer 2010). These three key performance indicators provide each university with an overall score and define a university's research status in a

competitive higher education context. This model emphasises the need for universities to be socially and economically accountable for their research work so that it supports economic and educational policy (Neumann 2005). Changes, however, stress timely completion and the quantity of research outputs (Sampson and Comer 2010), causing tension that potentially interferes with supervision. This has consequences for both supervisors and students.

At the same time, there are increases in the numbers of students seeking research training in the international context (Rizvi 2010; Robinson-Pant 2010). The globalisation of higher education suggests that research students are a ready source of income (Park 2005). Although there are more doctoral students (Emilsson and Johnsson 2007), there are fewer full-time students as part-time students have increased (Watts 2010). Part-time students are usually in their 40s, have substantive family and work commitments and need extended time for completion (Evans 2010; Watts 2010). While some universities assess risk potential when selecting research students, completion is still very difficult to predict (Manathunga 2005a). For example, one Australian study reports that part-time students are more likely to complete quickly, when compared with full-time students, if permanent residency, field of study and English-speaking backgrounds are taken into account (Rodwell and Neumann 2008).

Clearly, the challenges facing students and supervisors are complicated in a context where fast supervision is important (Green and Usher 2003). There is a tension between student expectations for research education and the institutional emphasis on research and employment capability development (McCormack 2004). Different expectations influence research supervision (Gill and Bernard 2008) in that supervisors are both teachers of research and responsible for the pastoral management of students who have multiple responsibilities externally. Consequently, the supervisory role has expanded and now includes an advisory role, a quality control role, a supporting role and a guiding role (De Beer and Mason 2009). Changing roles illustrate how supervision is situated in a context where wider faculty issues influence the quality of the process.

Faculty issues

Like everything else in research supervision, faculty issues are wide-ranging and include the quality of faculty, student success, supervision pedagogy and models of supervision. Not surprisingly, the quality of research supervision depends on the quality of faculty. Quality service provision is a key performance indicator for universities internationally (Manathunga 2005a, 2005b). Quality in this context is defined as the faculty credentials, research and publication records, grant success and supervision completions (Kim, McKenna, and Ketefian 2006). Quality management, however, is challenging when staff shortages, aging workforce and inexperienced faculty are considered (Ellis 2005; Minnick et al. 2010). This said, faculty undoubtedly influences student success.

Institutions measure student success in terms of timely completion (McCormack 2004; Yam 2005), which they see as influenced by programme capacity issues, funding, faculty–student relationships, advisory input, graduate policies and practices (De Valero 2001). Students however take a different view, reporting that the major problem with timely completion is inadequate supervision (Emilsson and

Johnsson 2007). Gill and Bernard (2008) stated that the major determinant of student success is the effectiveness of the student–supervisor working relationship. Positive relationships promote success, while poor relationships negatively affect timely completion (De Valero 2001; Gurr 2001). Supervisory experience, or the lack of it, may contribute to supervision problems. Risk increases when a student has personal problems and when there are supervision relationship problems, project management issues and difficulties accessing support from the faculty research culture. Experienced supervisors, however, recognise the danger signals and step in to provide appropriate teaching and support (Manathunga 2005a).

Overall, it is evident that supervisors are expected to coach and mentor students, teaching, guiding, and advising the researcher in training for several years (Nulty, Kiley, and Meyers 2009). Thompson et al. (2005, 283) argued that the relationship can be 'intellectually and emotionally demanding'. Supervisors have reported issues with isolation, lack of confidence and competence, not to mention a lack of rights (Emilsson and Johnsson 2007). While teachers enter supervision with varied teaching expertise, supervision is a specialist activity that is learned through a combination of improved theoretical understandings plus an active participation in the process. Emilsson and Johnsson (2007) suggested that formal training programmes, over a period of time, go a long way to addressing some of the issues. Formal training may pre-empt a supervisor having to learn through trial and error and if supervision pedagogy is included in the programme there is potential to improve the quality of research supervision.

Supervision pedagogy

In the New Zealand context where university funding changes emphasise research outputs, supervisors face increasing pressure to support students in completing their studies and working towards publication in a timely manner. However, not all teachers are specialised in supervision. Over the last decade, there has been a push towards examining doctoral supervision as 'pedagogy' (Boud and Lee 2005; Johnson, Lee, and Green 2000; Petersen 2007). Many authors agree that supervision pedagogy impacts supervision effectiveness (De Valero 2001; Emilsson and Johnsson 2007; Gill and Bernard 2008; Golde 2010; Ives and Rowley 2005). Firth and Martens (2008) argued that supervision is a specialist form of 'teaching' complete with its own institutional roles and responsibilities. Emilsson and Johnsson (2007) believed that supervision is a sophisticated, high-level teaching process in which learning is central. These views are different to the traditional view of supervision that has focused much more on methodological issues. When supervision pedagogy is emphasised, it is assumed that research students need to be taught how to research, how to write a grant proposal, how to prepare an ethics proposal, how to review the literature, how to write, how to analyse data and how to manage a research project. This view supports the notion that research students will engage in capability expansion (Walker 2010) and do this better when they are taught (Dixon and Hanks 2010; Goode 2010). Pearson and Brew (2002), for example, have focused on supervision as teaching, developing cognitive apprenticeship strategies in which the supervisor role models the doing of research tasks for students. Clearly, supervision style influences how processes are managed (Adkins 2009). The teaching emphasis underpinning

process management certainly removes the pressures related to effectiveness measurement and timely completion.

Many writers (from countries other than New Zealand) believe that if supervision pedagogy is central, processes will be attended to and outcomes improve (Arambewela and Hall 2008; Evans and Stevenson 2010; Lee 2008; Manathunga 2009; Sinclair 2004; Taylor and Beasley 2005; Zhao, Golde, and McCormick 2007). However, much depends on the supervisor's approach that varies from a 'hands-off' mode, wherein the supervisor largely leaves students to their own devices, to the 'hands-on' mode, which tends to promote faster completions (Sinclair 2004). Teaching in the hands-off' mode requires students to manage their own research project, while the hands-on mode is much more structured (Taylor and Beasley 2005). Thus, the pedagogical input varies from structural emphasis on tasks to the management of relationships that have a socio-emotional component (Manathunga 2009). Ideally, supervision pedagogy would be all-inclusive of both the structure and the process.

In reality, understandings of supervision pedagogy are variable. However, Lee (2008) presented a framework that incorporates different modes of supervision plus supervision pedagogy. She proposes an approach which integrates research project management with enculturation into the disciplinary community, critical thinking development, emancipation and quality relationship development. This approach may be a way to ensure that the multiple demands of research supervision are addressed. It may facilitate the sharing of supervision responsibilities so that the student and the institution are equally involved in the process (Walker and Thomson 2010). The approach is limited though, as it is a Western view of the world which does not take into account Asian views of teaching and learning (Evans and Stevenson 2010; Lee 2008). This has implications for research supervisors working with increasing numbers of international students.

Studies in Australia and the USA exploring the student perspective of the supervision process have found that supervisor feedback, good access, academic advising and personal touch are among the most important variables influencing student satisfaction (Arambewela and Hall 2008; Zhao, Golde, and McCormick 2007). Results suggest that students want both structure and support, which may challenge some supervisors who see their role as moving the novice student through dependency and interdependency to full independence as a researcher (Grant 2005; Lee 2008; Moriarty, Danaher, and Danaher 2008). What stands out is that supervisors need to be adaptable and supervision style discussed openly to ensure compatibility that meets the need of both parties (Deuchar 2008). Overall, different models of supervision are required for different students.

Models of supervision

The problems with timely completion and the introduction of supervision pedagogical issues, and their influence on supervision processes, have resulted in an examination of various models of supervision (Boud and Lee 2005; Johnson, Lee, and Green 2000). Oddly enough, despite the significance of the subject, there is little research evidence to support the efficacy of these models (Buttery and Richter 2005). There are three types of supervision:

- *traditional model*, which involves a dyadic relationship between a supervisor and a student;
- *group supervision*, in which a relationship exists between a supervisor and a student and between a student and a student; and
- *mixed model*, which is a mixture of the above two and also incorporates new technologies, including the use of online programmes and teleconferences.

The traditional model of supervision prepares students for independent research. Independence development assumes that the supervisor is the expert and the student is the apprentice who learns by doing (Manathunga 2005a; Nulty, Kiley, and Meyers 2009; Parker 2009). Usually two supervisors work with a student, meeting regularly to discuss and document progress. Highly structured on the surface, closer scrutiny suggests that supervisors engage in mentoring, sponsoring, progressing and coaching (Pearson and Kayrooz 2004). The model seems to suit intelligent, self-directed students who are capable of becoming independent researchers with minimal input from their supervisors (Manathunga and Goozee 2007). However, students may miss out on broader discussions with other students and faculty (Neumann 2005) and isolation may limit researcher capability development if the requirements for contributing to the knowledge economy are considered (Walker 2010). Nonetheless, Wisker, Robinson, and Shacham (2007) argued that group supervision offers an alternative model that provides supportive cohort interaction.

Informal peer support from students complements the formal supervision process. Yet, while the aim of group learning is to promote intellectual independence (Manathunga and Goozee 2007) and collective learning certainly offers social and emotional support, it does not necessarily promote scholarly development (Parker 2009). Parker (2009) proposed a community learning approach to research supervision, suggesting that scholarly writing groups may change student attitudes towards writing. For some time now, doctoral writing groups have been shown to improve writing outputs (Aitchison and Lee 2010). Under the community model of supervision, doctoral supervisors arrange workshops that cover topics such as regulations and standards, research design, writing, library skill development, research problem-solving seminars and tutorials, and methods classes, all of which support learning. Networks across the university are formed and may provide a research community for the exchange of ideas that complements supervisory input. There is some evidence suggesting that the group supervision model improves the supervisory process (Buttery and Ruchter 2005).

A third model of supervision is the blended learning approach (De Beer and Mason 2009), which, importantly, utilises the environment (Boud and Lee 2005). Environment not just involves immediate infrastructure resource issues but includes communities of people who are intellectually, socially and geographically complex and dispersed. The blended learning approach combines individual sessions between a supervisor and a student, with a virtual classroom that offers teleconferences, online exemplars, discussion groups and self-paced online courses (Morrison 2003). Crossouard (2008) has argued that this model of supervision has been most effective for strengthening relationships between supervisors and students. It has also created communities of practice (Wisker, Robinson, and Shacham 2007). This model reflects the recent changes in higher education and the move to blended teaching approaches that include face-to-face contact combined with online learning.

The final model of supervision that is seen today is the professional doctorate, such as the Doctorate in Education developed in the 1920s. Education professional doctorates commenced at Harvard University and have led to the development of nursing and health sciences doctorates in Ireland, Australia and New Zealand (Ellis 2006). Australian development has been substantial and now includes professional doctorates in engineering, law, accountancy, psychology, management and the creative arts (Neumann 2005). The UK offers professional doctorates in business administration, education, engineering, nursing and midwifery (Scott et al. 2004). Neumann (2005) suggests that the professional doctorate is particularly attractive to policy-makers and advisors, as it is seen as revenue generating and a way of ensuring research relevance in doctoral research training (Neumann 2002). The professional doctorate targets students entering employment in areas other than academia and those already employed seeking professional and career development for the workplace (Eley and Murray 2009). While students usually have substantial experience in the workplace, most do not have the grade-point averages for PhD entry. Fundamental to the professional doctorate, as it is in many PhD programmes in Australia (Neumann 2005), is formal coursework and research in the professional field. The aim is to develop students so that they have the research capability to become active contributors to the knowledge economy in the workplace. Students attend classes in topics such as leadership, research methodology and policy development, where they work through the development of a research project, which will make a significant contribution to change and development in the workplace. The main advantage of this model is that students develop in a group and establish research networks. The disadvantages, which may be related to student entry capability, are similar to the problems associated with timely completion and supervision, which have already been discussed (Ellis 2006).

Strategies for improvement

To succeed in the current climate of global socio-economic change, it is vital that universities seriously consider and implement strategies to ensure successful growth and development in postgraduate research. Two strategies that standout from the literature and deserve closer consideration are: (1) faculty development in a changing research context; and (2) implementation of formal student research training.

In New Zealand, the broader research context has changed dramatically in the last decade. Thus faculty development through formal training packages is necessary to update supervisors on these changing needs. Academics need to appreciate how institutional and government change influence research supervision. For example, the push for publication during thesis writing is demanding, as are the socio-political accountabilities to the wider community. Changes to funding structures have had, and will continue to have, a substantive effect on the nature of university work, research topic options, the models of supervision, student management and how academics manage their supervisory responsibilities. Therefore, research supervisors need training that addresses changes to policy and processes, wider university sector requirements, supervision pedagogy and alternative models of supervision, all of which impact the quality of research supervision. It is proposed that this faculty training take place at the start of each academic year.

Secondly, as supervisors require training and updates regarding supervision practice, so do students need research training. The increasing number of research students makes the traditional models of one supervisor and one student, and in some cases two or even three supervisors and one student, more difficult to maintain. An alternative is to offer courses for research students that cover topics such as literature review, ethical proposal preparation, grant applications, research design, data analysis techniques, thesis writing, and paper presentation and publication. While many universities already offer these courses, participation tends to be student-directed. More often than not, this teaching takes place in one-to-one meetings that are time-consuming and repetitive for the supervisor. Furthermore, unless a student is highly independent, learning in this model tends to be slower. Therefore, an alternative needs to be considered.

For instance, De Valero (2001) recommended a two-semester orientation course for postgraduate students. Students receive information about degree and research options, courses available, requirements and professional development issue. Once they enrol in research they can access the research capability development detailed above. This formal approach to research training would also include regular university-wide seminar presentations and colloquia where students would share research ideas and preliminary results, so that they could receive feedback from faculty and peers, learning in and from the wider academic community (De Valero 2001). This university-wide approach has the potential to develop a strong, supportive student research community that fosters collegiality, commitment to research and student success. Therefore, student classes should be embedded as part of postgraduate studies. That said, although students who attend group sessions have the benefit of learning from discussions with student researchers, quieter students or students with English as a second language may find group supervision challenging. Therefore, careful ground rule setting and modelling of constructive behaviour by supervisors is encouraged.

Conclusion

This review of literature draws attention to the challenges of doctoral research supervision. Today, research topic choice may be influenced by stakeholder interests and government funding. Funding arrangements are certainly tighter and this impacts timely completion, which is the central issue for research supervision. When these challenges are considered, along with the opening up of the global research education market, it is evident that something needs to change. While more students seek research education, this raises all sorts of issues for supervisors and university systems. Therefore, it is critical that universities review their approach to the management of doctoral research students.

While the context has changed significantly, most research teaching takes place in the traditional model. The result is numerous academics teaching individual students the same thing in separate situations. In the New Zealand context, it is questionable how long this can be sustained. It is argued that a mixed model of supervision is required. This mixed model allows for multiple supervisor student relationships and incorporates learning technology that provides support systems for the growth and development of research students. This is critical for successful completion, but it does not deplete the limited source of supervisors. The introduction of formalised

research capability development classes for all doctoral research students holds promise in terms of encouraging recruitment, retention and completion. However, it also relies on supervisors being aware of, and kept updated on, faculty changes and the demands of the current research agenda. Hence, supervisors also need formal supervision training. Offering supervisors the opportunity to upskill through formal training may develop research excellence and promote timely student completion. In summary, postgraduate research supervision occurs within a rapidly changing environment. It is imperative that supervisors understand the significance of external changes and find alternative ways to address change that also impacts on the research supervision process.

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