



Promoting excellence in higher education

Final Report

Building Research Supervision and Training across Australian Universities

University of Technology, Sydney

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www.first.edu.au/public/ALTC



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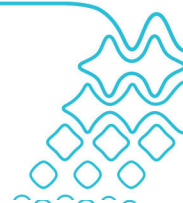
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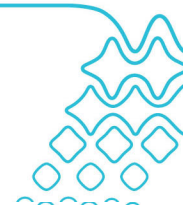
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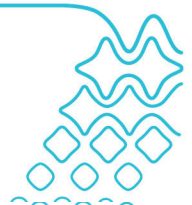
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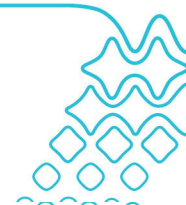
The project team would like to thank the many research education leaders, coordinators, and supervisors across Australian and New Zealand universities who participated in the symposium, survey and interviews. We are well aware of the pressures on their time and are also aware that without their contribution the project could not have been completed.

Finally, the team would like to thank the deans and directors of graduate studies who assisted with distribution of the survey and contacts for interviews. Their participation and support enabled us to address the logistical challenge of accessing research education leaders, coordinators and supervisors within their universities.



List of abbreviations

ANU	The Australian National University
APA (I)	Australian Postgraduate Awards (Industry)
ARC	Australian Research Council
ASCED	Australian Standard Classification of Education
ATN	Australian Technology Network of Universities
AUQA	Australian University Quality Agency
BFOS	Broad Field of Study
DDoGS	Deans and Directors of Graduate Studies
DVC	Deputy Vice-Chancellor
ERA	Excellence in Research Australia
fIRST	for Improving Research Supervision Training
Go8	Group of Eight Universities
HDR	Higher Degree by Research
ICT	Information and Communication Technology
IPR	Intellectual Property Rights
IRU	Innovative Research Universities
IT	Information Technology
NGO	Non Government Organisation
PVC	Pro Vice-Chancellor
QA	Quality Assurance
QUT	Queensland University of Technology
UTS	University of Technology, Sydney



Executive summary

Building Research Supervision and Training in Australian Universities was undertaken with the aims of identifying existing higher degree research supervisor training provisions; identifying current and future needs of supervisors and making recommendations that assist universities in their on-going development of effective higher degree research supervisor training.

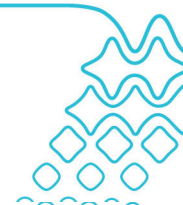
Outcomes from the project as a whole highlight the importance of the changing place of knowledge in contemporary society and resulting implications for higher education. They also highlight the significance of the changing context of research education for both supervisors and their students; and the impact of such changes on the roles and responsibilities of supervisors and on supervisor development. Specific outcomes and their implications from the project have been addressed in the report under four major headings:

- professionalisation and formalisation of research education;
- growth and diversity in research education;
- changes for supervision practices and
- changes for supervisor development.

The project provides evidence that pressures within universities for *increasing professionalisation and formalisation of research education* have resulted in supervision of research students becoming more transparent and accountable, and supervisory practices becoming increasingly subject to scrutiny. A major finding from the project is that, with these changes, there is a need for increasingly sophisticated and constructive conversations about supervision pedagogy that engage all supervisors, both new and more experienced. Such conversations need to go beyond issues of compliance to address quality of supervision and good supervisory practices. A further finding from the project is that there is a need in many universities for greater emphasis on professional leadership in research education. (See Recommendations 1, 2 and 3.)

All project participants identified *diversity* as a major factor in research education: in the linguistic and cultural diversity of students; in diverse process of and modes of study; in the role of technology in mediating supervision and /or conducting research; in non-traditional and interdisciplinary outcomes from research education; and in the diverse career paths followed by students on completion of their degrees. Project outcomes suggest the need for greater acknowledgement within universities of the theoretical and practical challenges of supervising and examining interdisciplinary and non-traditional research education projects. They suggest the need for at least some universities to update their systems, rules and regulations governing supervision and examination of theses. They also suggest the need for universities to further acknowledge and address the issue of research students' academic literacies. (See Recommendations 4, 5 and 6.)

The changing context of research education has resulted in *changes to supervision and supervision practices*. Project outcomes provide evidence that the roles required of supervisors are changing and expanding. At the same time supervisors are expected to comply with QA processes. Outcomes highlight the additional demands placed on supervisors by international and local students who are experiencing difficulties, and indicate the need for further/better support and resources to assist supervisors address these demands. Outcomes also show that supervisors are concerned about their workload pressures, not from supervision *per se*, but from the need to balance time for



supervision against demands of teaching, research and administration. (See Recommendations 7 and 8.)

Changes in research education and supervision have resulted in *changes for supervisor development*, and point to new challenges for those responsible for supervisor development and training. Project findings indicate general agreement on the need for systematic support for new supervisors to introduce them to roles and responsibilities of supervision; to key QA processes; to issues of compliance and possible pitfalls; as well as to good supervisory practices. However, the findings also indicate considerable resistance from more experienced supervisors to compulsory, centralised and formal training programs; and a strong preference for locally and informally supported learning, especially that which addresses 'just in time', and on-demand supervisor support and development. The project thus provides evidence of the need to rethink some of the ways in which supervisor development is currently conceived and organised. Further, it suggests the need for locally situated programs that can engage experienced supervisors in creative and innovative ways. (See Recommendation 9.)

Project outcomes provide evidence of overall levels of dissatisfaction amongst supervisors regarding existing levels of resources, and indicate the need for additional targeted resources for supervisors and for supervisor training and development. (See Recommendation 10.)

Summary of recommendations

Recommendation 1: That universities provide additional ways of facilitating rich and sustained conversations about research education and ensure systems and processes are in place to support such conversations.

Recommendation 2: That universities further support and develop leadership in research education at central and local/faculty levels.

Recommendation 3: That ALTC commission a project on leadership in research education.

Recommendation 4: That universities ensure systems, guidelines and regulations be reviewed to ensure they keep pace with the changing nature of research education.

Recommendation 5: That universities further address the challenges faced by supervisors as a result of increased growth and diversity in research education.

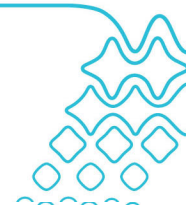
Recommendation 6: That the higher education sector and individual universities further acknowledge and provide resources to address academic literacy in research education.

Recommendation 7: That universities address pressures on supervisors by identify and responding to supervisors' major concerns in supervision.

Recommendation 8: That universities acknowledge pressure of supervision when negotiating supervisors' workloads.

Recommendation 9: That universities review existing professional development programs to ensure they address the different needs of new and experienced supervisors.

Recommendation 10: That universities review existing and future resources for supervisor development.



Introduction to the project report

This section of the report, and those that follow, provide a detailed account of the project *Building Research Supervision and Training across Australian Universities*. These sections begin with an account of the approach and methodology undertaken in the project, followed by an overview of major outcomes and recommendations. For interested readers, further details of outcomes from separate sources of data (from symposium, survey and interviews) are provided in later sections of the report.

In 2007, the Australian Learning and Teaching Council (then Carrick Institute for Learning and Teaching in Higher Education) provided funding to a UTS-based team, working in conjunction with the FIRST Consortium, to undertake a project with the overall aim of building and supporting research supervision and training across Australian and New Zealand Universities. The project was undertaken in a context where research and innovation are increasingly seen as central to the development of Australia's competitiveness in a global economy, and where much of our success in this area is seen as dependent on a cohort of well-trained researchers. It was also undertaken in a context where universities are increasingly motivated to improve their research training performance – in part through the achievement of timely quality research degree completions in areas of research strength aligned to national priorities, but also through efforts to improve research supervision, and through more effective approaches to supervisor training and development.

The specific aims of the project were:

- to identify existing higher degree research supervisor training provisions;
- to identify current and future needs of supervisors; and
- to make recommendations that assist universities in their on-going development of effective higher degree research supervisor training.

Approach and methodology

The project was designed in two stages. The first consisted of a symposium of key academics in the field of supervision pedagogy. Outcomes from the symposium then informed the development of the second stage – a scoping exercise where information was sought from individuals and groups, via survey and follow up interviews, about existing practices, available resources, and perceived future needs in research education and supervision.

The approach and methodology undertaken in the two stages are outlined below.

Stage one – the symposium of scholars and practitioners of research education

The purpose of the symposium was to bring together experts in the field to address current key issues and future directions in research education. It thus provided the broader context within which the scoping exercise was located. During the symposium, twenty-five key academics from Australia and New Zealand participated in a two day discussion that was organised around six major topics:

1. What is the future nature and purpose of the doctorate?
2. What is the role of supervision in research education?



3. How will the increasing accountability of universities affect research education?
4. What is the current state of research supervisor education?
5. What are the implications of the growing diversity of candidates and supervision arrangements?
6. What is the agenda for future research education?

A team leader and co-presenters provided input for each of the sessions and then general discussion was invited from all symposium participants. All sessions were recorded.

Following the symposium, a summary of discussion of each of the six sessions was provided to the team leader and co-presenters. The summaries were adjusted in the light of feedback from these participants. These summaries then provided the basis for an overall summary of outcomes from the symposium. While the task of reducing two days of symposium discussion to a summary was necessarily a reductive exercise, it enabled the project team to identify key themes from the symposium and to draw on these in Stage 2 of the project

A consolidated report from the Symposium discussion was sent to all participants. It was also published on the fIRST website (www.first.edu.au). A copy is also included in a later section of this report.

Stage two – the scoping exercise

The purposes of the scoping exercise were to learn more about current research education programs, practices and priorities; and about perceived future needs in research education and supervision development. The scoping exercise itself consisted of an online survey of supervisors from universities in Australia and New Zealand and a series of follow up interviews with research leaders, faculty co-ordinators, and supervisors.

The survey of supervisors in Australia and New Zealand universities

The survey represented the biggest source of data for the project. Its specific purpose was to seek information from practising supervisors from all universities in Australia and New Zealand about their existing supervision practices, the resources they use in supervision, and their perceived future needs in research education and supervision. A total of 47 (from a possible 50) universities participated in the survey. A total of 1884 responses were received. This represents responses from approximately 10% of the overall supervisor population in universities in Australia and New Zealand. Survey responses were broadly representative of the general population of research degree supervisors in terms of discipline distribution, gender and representation from supervisors in Australia and New Zealand. Thus the survey population can be considered as broadly representative of the general population of research degree supervisors.

The survey questions were organised around the following Sections:

- Section 1: About the supervisor: background information about supervisors' academic disciplines and their levels of experience in supervision;



- Section 2: Research Supervision practices: supervisors' priorities in their work as a supervisor, and their own supervision practices;
- Section 3: Development and support of supervisors: supervisors' views on what shaped their development as a supervisor and their views on the nature of support that will facilitate effective supervision; and
- Section 4: Views on the nature of research and future directions: supervisors' views on research and on being a researcher, their views on future directions of doctoral research.

In developing the survey, the project team drew on outcomes from the symposium as well as research in related areas. Some questions were designed deliberately to build on specific research to enable comparisons between survey responses and outcomes from that research. The following authors gave permission for their work to inform these questions: Orrell & Condon (2004) Q6; Pearson & Kayrooz (2004) Q7; Pearson & Brew (2002) Q8; Åkerlind (2008). Qs 12, 13 & 14.

Development of the survey involved processes of drafting, revising and piloting of questions. The final version of the survey was made available electronically, via a University of Technology, Sydney (UTS)-based survey design and implementation tool. To encourage maximum participation, initial discussion of the project occurred at a meeting of the Deans and Directors of Graduate Studies (DDoGS). An invitation to participate in the survey was then emailed to the DDoGS representative at each university, who was asked to pass on the invitation to all supervisors in their university. The DDoGS representatives were also asked to send out a reminder email to supervisors. Electronic access to the survey was available for 8 weeks. (See Appendix 2 for a copy of the survey questions.)

Analysis of responses to the survey first involved downloading data from the UTS site. Responses to closed questions were analysed quantitatively using SPSS and Microsoft Excel. Responses to open ended questions were analysed qualitatively using content analysis to identify major recurring themes and issues.

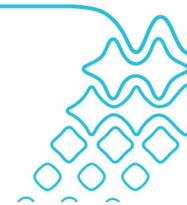
A summary of outcomes from the survey is available both on the FIRST website and also later in this report. Further details of analysis of data are provided in the summary of outcomes.

Interviews of research leaders, research degree coordinators and supervisors

As indicated, following analysis of the survey, a number of follow-up interviews were undertaken. They provided an opportunity to follow up in greater detail some of the major issues that had emerged from both the symposium and the survey.

The interviews were of two kinds: those that sought the views of leaders of research education within universities and faculties; and focus group discussions with groups of supervisors. Predictably, these two groups overlapped to some extent. For example, research education leaders were also typically active supervisors, while some of the supervisors who attended focus group discussions were also coordinators of research programs within their faculties. Nevertheless, interviews with the two groups did provide some differences in perspectives.

Six universities were approached to participate in the follow up interviews. These included two Go8 research-intensive universities; two ATN universities and two regional universities. Universities were selected on the grounds that they were representative of different categories of universities, and that they were from different



Australian states. The initial approach to these universities was via the DDoGS. The project team then followed up with a series of emails to the DDoGS representative at each selected university; to research degree coordinators (identified by DDoGS representative) and to focus group participants (identified by research degree coordinator). Interview times at each university were then negotiated.

In total, interviews were conducted with 59 participants. Of these, eight interviews were with research leaders (these included: PVC Research; DDoGS); 14 with research degree coordinators (these were coordinators of research degree programs) and 37 with supervisors in focus group discussions.

Interview questions were developed around a specific number of topics. For research leaders and research degree coordinators these were the:

- changing nature and purposes of research degree education: interviewees' perceptions of the extent to which research degree education is changing;
- changing purposes of research degree education;
- likely future directions in research degree education;
- likely implications of any changes for research degree supervision; and
- likely implications of changes for research degree education training.

For focus group interviews with supervisors, these were:

- purposes and priorities of research degree supervision;
- challenges of being a supervisor;
- influences on own ongoing development as a supervisor; and
- priorities in research supervision training and supervisor support.

(Interview questions are provided in Appendices 3 and 4.)

All interviews were audio recorded. Analyses of interviews began with a detailed summary of what was said in each interview. These summaries were double-checked by members of the project team. The summaries then provided the basis for content analyses that aimed to identify the major recurring themes and issues in interviewees' comments. On the basis of these content analyses, a framework was developed to summarise major themes and to identify major features within those themes. This framework in turn has provided the basis for the detailed summary of outcomes available both on the FIRSST website, and later in this report.

Ethics

Ethics approval for the project was sought and obtained from the UTS Ethics Committee. Issues addressed in the design of the project included ensuring identity of individual participants remained confidential; ensuring that participants were genuine volunteers; ensuring that no harm could come to focus group participants; and recording of discussions and interviews. These issues were addressed as follows.



Confidentiality of participants

While the project team was necessarily aware of the identity of Symposium and interview participants, summaries of outcomes from the Symposium and interviews did not identify individual participants or their universities. Identity of survey respondents was not requested, and to ensure that no respondent could inadvertently be identified, where the response rate was less than 20, individual universities were not provided with details of responses from their supervisors (instead they were provided with a consolidated summary only).

Ensuring participants were genuine volunteers

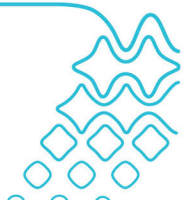
The project team regarded symposium participants' attendance as agreement to participate. Likewise the team regarded participants' survey responses as agreement to participate. While interviewees were nominated by the DDoGS representative at their university, they were free to refuse the invitation to participate in interviews. In addition, all interviewees signed letters of consent.

Focus group participants

Letters of consent for focus group participants included an agreement to abide by a code of behavior to ensure there could be no embarrassment or harm to other participants.

Recording of discussions and interviews

All participants were informed prior to the event that discussions and interviews would be recorded.



Project outcomes, conclusions and recommendations

This section of the report provides a summary of project outcomes that draw across all sources of data: symposium, survey and interviews. This section also presents major conclusions and recommendations. It thus represents an elaboration of the Executive Summary. Later sections of the report present more detailed outcomes from individual sources of data. The organisation of the report is thus designed to provide the reader with easy access to the project, its major outcomes and recommendations. Readers with an interest in the details of project outcomes will find these in later sections where specific outcomes from the symposium, the survey and interviews are presented separately.

Project outcomes

What emerges from the project as a whole is the importance of the changing place of knowledge in contemporary society and resulting implications for change in higher education. Project participants consistently emphasised the significance of the 'knowledge economy' where economic performance is seen as linked to the development of a skilled and innovative workforce, and where individuals in the workforce are seen as 'knowledge workers'. As participants pointed out, these new ways of conceiving knowledge challenge traditional notions of research, and also of research education.

The project highlights the significance of the changing context of research education, and points to current rethinking within universities regarding the nature and purposes of research education in the twenty first century. The changes evident in research education, however, need to be seen in the context of pressure for change in higher education as a whole. The project provides evidence of the specific ways in which these changes are impacting on research education and on those involved in research education. Relevant factors here include the expansion of universities within a globalised and digital society; more active involvement of government in universities; more emphasis on Quality Assurance (QA) and on mechanisms to monitor QA; and more active central administration and management within universities themselves. Government intervention and the impact of QA in research education have resulted in the more active involvement of university administrations in research education and in what goes on within individual faculties. As project participants have indicated, a consequence of this is that universities are currently involved in debates about the nature of research education: about the extent to which it is primarily research or education (and whether research education should be located in research or education portfolios); about its purposes – to produce research or to produce researchers; about the place of the individual researcher and individual project in relation to research teams and team projects; and about the balance of these issues in research education within specific disciplines and faculties.

A further relevant change in research education in recent years is the place of supervision within the research degree process. Previously, research education consisted primarily of completion of a thesis and the supervisor was central to this process. Now, when undertaking research education, students are also involved with other networks, other communities and are subject to influences and practices beyond their supervisor. Graduating research students are expected to have developed a range of generic skills. In addition, students are increasingly undertaking their research education as part of a team. While involvement with team projects has long been common in the sciences, it is becoming increasingly common in social sciences. While completion of a thesis remains important, supervision increasingly needs to be seen as one part of the larger process of research education. As participants in the project symposium put it, there is a need for universities and for supervisors to think more



broadly about the total environment for higher education and role of all players within the 'ecosystem' that is research education.

The ways in which these changes and debates are being played out in universities are having a substantial impact on supervisors and their roles and responsibilities in supervision. They are also having a substantial impact on supervisor development. Outcomes from the project provide evidence of the ways in which research leaders, coordinators and supervisors have been affected by changes in research education. These outcomes are elaborated below, under four major headings. These are:

- professionalisation and formalisation of research education;
- growth and diversity in research education;
- changes for supervision practices; and
- changes for supervisor development.

Professionalisation and formalisation of research education

As indicated, findings from the project highlight the changing context of research education. They also highlight the pressures for increasing professionalisation and formalisation of research education that are being experienced within universities. Such pressures result from higher expectations of government and other peak bodies in regard to research degree completions, and their increasing intervention in research education within universities. They also result from an increasing emphasis on QA processes and mechanisms in universities as a whole, and in research education in particular.

A consequence of the increasingly formal and professional approach to research education and to supervision is that supervision of research students is becoming more visible, transparent and accountable. Supervision no longer occurs just in the private space between supervisor and student. As research education has become more accountable, supervisory practices have become increasingly subject to scrutiny. Outcomes from this project indicate that those involved in research education are generally positive about the shift from private to public 'space'. They are also very positive about the value of talk about supervision as a way of improving supervision. Such talk provides a context where supervisors can reflect on roles and responsibilities in supervision, draw on insights from others regarding good supervisory practices, and share specific challenge or problems they may encounter in their work with individual students.

The shift to a more formal and professional approach to research education across universities also highlights the need for increasingly sophisticated conversations about supervision pedagogy that go beyond mere compliance with QA. Such conversations need to address broader questions about the nature of research education, theoretical understandings of supervision, and the quality of supervision. Thus a major finding from the project is the importance of ways of engaging all supervisors, both new and more experienced, in constructive conversations that go beyond issues of compliance to address quality of supervision and good supervisory practices.

Facilitation of such discussions requires professional leadership. While most universities have research degree coordinators at both central and local levels, outcomes from this project indicate there is considerable variation between universities in the ways in which these positions are conceived. In at least some universities, these roles are conceived primarily as administrative, rather than in research education



leadership roles. Thus a further finding from the project is that there is a need in many universities for greater emphasis on professional leadership in research education.

Recommendation 1: Facilitate rich and sustained conversations about research supervision.

The project recommends that universities provide additional ways to facilitate opportunities for rich and sustained conversations across academic communities about research education, and that they ensure systems and processes are in place to facilitate and support such conversations.

Such conversations would include at least:

- implications of changes in research degree education for students and for supervisors;
- processes for compliance with Quality Assurance standards;
- ways of theorising what it means to be a supervisor;
- the nature of good supervision practices, including insights from cross disciplinary, cross institutional discussions; and
- specific strategies that support supervisors in their work with students.

The project also recommends that such conversations, and the systems and processes that support them, be located at both local (faculty) and central levels, and that they include cross disciplinary and cross institutional perspectives.

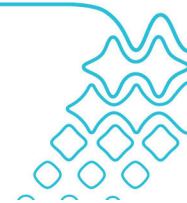
Recommendation 2: Further support and develop leadership in research education

The project recommends that universities enhance their leadership in research education at central and local levels, (e.g. graduate school and at local/faculty levels).

At the central level, leadership could be enhanced by more systematic coordination across universities of all activities pertaining to research education and professional development for researchers.

At the local/faculty level, leadership could be enhanced by:

- recognising the increasingly important role of research degree coordinators in leading and supporting supervisor development at the local level within (and between) faculties, and providing appropriate resources and support to enable these coordinators to be proactive in this area; and
- developing and coordinating systematic mentoring programs that function within and between faculties.



Recommendation 3: A project on leadership in research education.

The project commends ALTC for its support to date for the investigation of research education and recommends that it consider making research education a priority issue for the future.

Further, the project recommends that ALTC commission a project specifically on leadership in research education and that this project address ways in which universities can develop and implement models of distributive leadership in research education. Such a project would support universities to enhance research education leadership at both central and local/faculty levels.

Growth and diversity in research education

As Pearson, Evans & Macauley (2008) point out, diversity is not a new phenomenon in research education. However, with the considerable growth in research education programs recent years, supervisors' experiences of increased diversity are very real and participants in the project consistently highlighted diversity as a major factor in research education. They noted that this diversity is evident at a number of levels:

- *amongst students*: diversity is most obviously evident in the range of students that supervisors encounter. They may be diverse in their age and gender, and in their life experiences; they may be international or local students; and they may be diverse in their linguistic and cultural backgrounds;
- *in processes and modes of study*: research students are able to study in full or part-time modes; their physical location may be different from that of their supervisor as they may live and work in different countries or may be enrolled in different universities; they may be involved in face-to-face or distance supervision;
- *in the role of technology in mediating supervision and/or conducting of research*: the role of technology in students' research may vary depending on the nature of their research; it may also vary depending on their physical location and mode of study;
- *in outcomes from research education*: diversity in outcomes from research education are evident in the proliferation of projects and theses that are non-traditional and/or interdisciplinary, and that push the boundaries of what counts as a thesis. Diversity in outcomes are also evident in increasing expectations that students will develop a range of skills and abilities in addition to successful completion of a thesis (e.g. skills with specific methods of data collection and analysis; in preparing and presenting conference papers; in publications etc); and
- *in students' career paths following completion of their research degree*: while some students pursue academic careers, increasingly others are seeking employment in range of other professions.

Project participants overall were positive about new ways of thinking about knowledge, about new ways of conceiving research and about new kinds of projects. However, they also pointed to the challenges for both supervisors and examiners associated with such changes, and the need for university structures to keep pace. Project outcomes here suggest the need for greater acknowledgement within universities of the

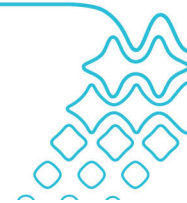


theoretical and practical challenges of supervising and examining interdisciplinary and non-traditional research education projects. They also suggest the need for at least some universities to update their systems and their rules and regulations governing supervision and examination of theses.

While participants agreed on the significance of growth and diversity in research education, they had differing views on the implications, especially of increasing numbers and hence of increasing diversity amongst students. Those who were research leaders and coordinators generally saw growth and diversity, including diversity of students, as providing increased opportunities for universities. Those who were practising research supervisors were more conscious of the challenges and difficulties that they experienced in their work with individual students. Project outcomes suggest the need for greater acknowledgement from universities of pressures on supervisors that result from factors such as:

- different physical locations of supervisors and students and challenge of communication and role of IT in mediating supervision;
- cultural and linguistic differences between students and supervisors; and
- interpersonal relationships between supervisors and students, and additional difficulties in establishing and maintaining these relationships with little or no face to face interaction.

An area of particular concern to supervisors was that of academic literacy. Supervisors reported high level of concern regarding many local and international students' abilities with academic reading and writing in English, and noted that they were frequently unclear about how much support they should provide for students in academic literacy. Questions raised by supervisors included: what level of support was appropriate; whether support with academic writing was legitimate; whether professional editors were acceptable, and if so, whose responsibility was it to pay for these editors. Supervisors reported being unsure at what point they should refer students for professional help with their academic reading and writing; and to whom they should be referred. In some instances, they also reported reluctance to refer students for help as the only help available was too general and did not address the specific disciplinary challenges faced by students. They also reported their own lack of knowledge of how to go about helping their students with academic literacy, and identified this as a need for their own further professional development. Outcomes from the project suggest the need for universities to further acknowledge and address the issue of research students' academic literacy.



Recommendation 4: *Ensure systems, guidelines and regulations keep pace with the changing nature of research education.*

The project recommends that universities review their own systems, guidelines, rules and regulations regarding both supervision and thesis examination to ensure:

- they are relevant to increasingly diverse interdisciplinary and non-traditional research education projects;
- they keep pace with pressures for increasingly interdisciplinary and non-traditional research education projects; and
- they provide relevant and appropriate guidelines for both supervisors and thesis examiners in regard to interdisciplinary and non-traditional projects, and their forms of presentation.

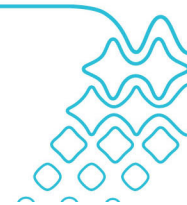
Recommendation 5: *Further address the impact of growth and diversity on supervisors and provide further support.*

The project recommends that universities further address the impact of diversity on research supervisors and the additional challenges they face as a result of:

- diverse geographical locations of supervisors and their students;
- working with culturally and linguistically diverse students;
- supervising interdisciplinary projects; and
- working with students who are experiencing difficulties or problems.

Such challenges could be addressed by ensuring structures and resources are in place to support supervisors in their work with diverse students and in diverse modes of study by, for example:

- addressing specific challenges within the professional development programs provided for supervisors, with appropriate follow-up support; and
- providing specific support mechanisms (beyond risk minimisation) for supervisors working with students experiencing difficulties (or for students working with supervisors who are problematic).



Recommendation 6: Strategies for addressing academic literacy in research education be improved.

The project recommends that the higher education sector and individual universities further acknowledge and provide resources to address the challenge faced by many research students (both international and local) and their supervisors in regard to academic literacy.

ALTC and the higher education sector could do this by:

- commissioning a project to clarify questions regarding roles and responsibilities of supervisors regarding support for students' academic literacies. Such a project, with reference to DDoGS guidelines on best practice, could provide guidelines in this complex area. It could also develop guidelines regarding the kind of professional knowledge of academic literacy required by supervisors.

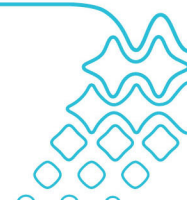
Individual universities could do this by:

- in addition to centralised resources, providing further discipline specific resources for students at the local/faculty level for teaching English for Academic Purposes (EAP); and
- providing appropriate professional development and resources to increase supervisors' own professional knowledge of academic literacy, and knowledge of how to support their students in academic literacy.

Changes for supervision practices

The changing context of research education and the pressure for formalisation and professionalisation of research education has had a considerable impact on supervision and supervision practices. As indicated earlier, this has resulted in the process of supervision becoming more visible, more open to scrutiny and more public. A consequence of this, noted by a number of project participants, is the decreasing relevance of supervisors' own supervisory experiences for supervision in the twenty first century university, and hence the need for supervisors to develop new supervisory practices. Unsurprisingly, there were some differences in the 'vision' of research education between research leaders and coordinators on the one hand, and supervisors on the other. There were also differences in views on the place and role of supervision. Research leaders generally were more explicitly conscious of the scope of change in research education, while supervisors were more focused on their students, and on the specific practices that would assist their students to complete their theses. Outcomes from the project highlight the importance supervisors placed on their work with students. They also highlight important disciplinary differences in supervisory practices, and the concern of many supervisors that space is retained for individual innovation and diversity within supervision practices.

Despite supervisors' continued focus on completion of theses, the project outcomes provide evidence that changes in the nature of research education are impacting on the roles required of supervisors and that these roles are changing and expanding. The outcomes highlight the diverse, and at times conflicting pressures on supervisors, and provide evidence that, in addition to their disciplinary and research expertise, supervisors are increasingly aware of pressure to:



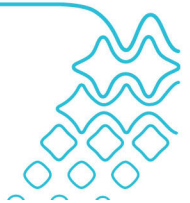
- take on complex and diverse roles as managers, mentors, coaches, facilitators and, at times, counsellors;
- meet the changing expectations and demands of students in regard to their supervisors (including students' expectations of value for money);
- balance teaching skills with discipline and research expertise ;
- balance support for students with their developing independence as researchers; and
- work in different ways with students who are increasingly undertaking their research as part of a research team and as part of a bigger research project.

In addition, supervisors are aware of expectations that they comply with QA processes. Research outcomes suggest these expectations have the following implications:

- pressure from QA processes for compulsory supervisor training (with variable levels of supervisor enthusiasm for this supervisor training);
- concern from some supervisors that QA driven supervisor development strategies prioritise compliance rather than quality of supervision;
- the need for universities to place more emphasis on informal and /or local professional development for supervisors within a QA framework; and
- concern from some supervisors that they are being pressured (as a result of QA compliance) toward a 'single model' of supervision, with insufficient recognition that the legitimate needs of supervision can be addressed in multiple ways.

Project outcomes show that supervisors are concerned about their workload pressures, not from supervision *per se*, but from the need to balance time for supervision against demands of teaching, research and administration. In addition, supervisors consistently noted the additional demands placed on them by some international and local students who were experiencing particular difficulties. Many also expressed concern that universities provided insufficient resources to assist them address these difficulties, and that the response to 'problems' was primarily one of risk management. They identified a number of specific areas where they felt they required further support. These areas included support for supervisors to:

- deal with demanding situations;
- assist students' develop the generic skills identified by universities;
- encourage students to complete publications;
- address issues of students' academic literacy;
- supervise students who are located outside of Australia; and
- supervise interdisciplinary projects.



Recommendation 7: Address pressures on supervisors by identifying and responding to supervisors' major concerns in supervision.

The project recommends that universities address the increasingly complex roles and skills required of supervisors by:

- ensuring strategies are in place to provide different levels of support for supervisors at point of need: from peers; from mentors; from department or Unit leaders; and where relevant, from those responsible for conflict resolution; and
- ensuring research education leaders have resources and support to develop and implement such strategies.

The project also recommends that studies are undertaken within individual universities to identify supervisors' specific priorities and concerns, and that additional relevant measures are put in place to address these.

Recommendation 8: Acknowledge pressure of supervision when negotiating supervisors' workloads

The project recommends that, when negotiating supervisors' workloads, universities take account of:

- the need to balance supervision with other academic duties (of teaching and research);
- the number of research students that are desirable for one supervisor, in relation to the supervisor's other responsibilities;
- the weighting of roles of principal and associate/co supervisors in workloads; and
- the time required for supervising students who are experiences specific challenges.

Changes for supervisor development

The overall changes in research education and supervision have further implications for supervisor development, and outcomes from the project point to new challenges for those responsible for supervisor development and training. As indicated earlier, the project highlights the need for new and more sophisticated ways of thinking about the nature of supervision and consequently of supervisor development. An implication here is that models of supervision training based on assumptions that supervisors simply need to 'top-up' their skills are inappropriate to address the increasingly complex nature of supervision in the twenty first century. As project participants noted, a major challenge faced by those involved with supervisor development is to find a way of balancing requirements of compliance with a comprehensive and ongoing focus on quality of supervision. Symposium participants noted that a further challenge is to find a balance between the 'carrot' and 'stick' approaches to engaging supervisors in development and training programs.



All project participants agreed on the importance of systematic programs that support new supervisors and familiarise them with roles and requirements of supervision. In sum, project findings in regard to development of new supervisors were:

- research participants agreed on the need for systematic support for new supervisors to introduce them to roles and responsibilities of supervision; to key QA processes; to issues of compliance and possible pitfalls; as well as to good supervisory practices; (they also acknowledged the existence of valuable induction programs already in existence in many universities);
- participants agreed that while some central support mechanisms are appropriate for new supervisor programs, they are not enough, and that some additional local/ faculty support is needed; and
- participants consistently identified mentoring as especially important for new supervisors.

However, the most consistent finding from the project was that on-going development of experienced supervisors is the most challenging aspect of supervisor development, and that there is considerable resistance from supervisors to compulsory, centralised and formal training programs. There is also considerable cynicism about the value of such programs.

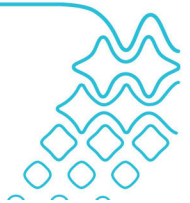
Project findings in regard to ongoing development of more experienced supervisors were:

- consistent agreement from project participants that centralised and formal learning has limited value, especially for experienced supervisors; and preference for locally and informally supported learning, especially that addresses 'just in time', and on-demand supervisor support and development; and
- evidence of different perspectives among project participants regarding the purpose of existing supervisor development programs: research leaders and coordinators generally saw such programs as part of academic professional development, while supervisors more frequently saw them as pressure for compliance.

Project outcomes thus provide evidence that there is a need to rethink some of the ways in which supervisor development is currently conceived and organised. Further, in the light of the major and consistent finding that supervisors prefer learning about supervision at the local level, the outcomes suggest the need for locally situated programs that can engage experienced supervisors in creative and innovative ways, but that also draw on cross faculty and cross institutional expertise where relevant. The project team suggests that such programs could usefully include *reactive, pre-emptive and proactive dimensions*.

Programs that addressed *reactive* dimensions would involve on-demand training that was specific to a particular issue with the purpose of bringing about change to a specific situation that had been identified as important by supervisors. They would be likely to be informal, and localised. They may also involve mentoring where new and more experienced supervisors work together.

Programs that addressed *pre-emptive* dimensions would be longer term and would typically address issues that had been identified as important by research leaders and coordinators. They may be centrally located, more formal in nature and would result in compliance with university requirements or QA mechanisms.



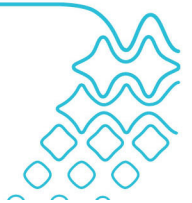
Programs that included *proactive* dimensions would address both at-risk situations and also address some of the more theoretical and practical issues regarding the quality of supervision and supervisory practices. Specific topics addressed in these programs would be initiated either by research leaders or by supervisors, and the programs could be located locally or centrally, depending on the specific topic being addressed.

A further implication from the project is that new ways of conceiving supervisor professional development will require new and additional resources.

Project outcomes provide evidence of overall levels of dissatisfaction amongst supervisors regarding existing levels of resources, and indicate the need for additional targeted resources for supervisors and for supervisor training and development. Outcomes highlight in particular:

- the need for resources that address the overall quality of supervision, including those that enable supervisors' to address their specific needs on a 'just-in-time' basis; and
- the possibility for further development of on-line resources, especially those that provide for point of need support.

Project outcomes have specific implications for the place of the fIRST consortium and website in providing resources for supervisor development. Outcomes provide evidence of support, but also evidence of considerable lack of awareness of its existence. It appears that in larger universities, some other on-line resources may complete with fIRST, however, participants from smaller universities reported higher levels of use of fIRST resources. Thus the project raises questions about the place of fIRST in supervisor development, and its direction for the future.



Recommendation 9: *Review of existing professional development programs to ensure they address the needs of supervisors.*

The project recommends that universities review their own procedures to ensure they have in place systematic and structured programs for the induction of new supervisors. Such programs should include:

- some centralised and formal component;
- some local component (this is what especially needs to be strengthened); and
- systematic mentoring programs that include peer support, as well as mentoring between less and more experienced supervisors.

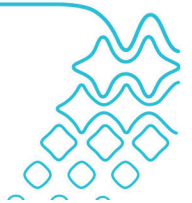
The project also recommends that universities rethink strategies for ongoing development of experienced supervisors by including reactive, pre-emptive and proactive dimensions within their supervisor development programs that will enable them to:

- seek more innovative and creative solutions to supervisor development beyond the standard course workshops;
- balance allocation of expertise and resources between central and local programs;
- tie the requirement for formal registration of supervisors to faculty-based programs on professional development;
- introduce a mentoring program (with benefits for both less and more experienced supervisors); and
- allocate resources to facilitate and support other informal supervisor learning opportunities that foster ongoing discussions about supervision.

The project also recommends that universities consider further developing and implementing modules on supervision in existing postgraduate higher education teaching programs.

Recommendation 10: *Review of existing and future resources for supervisor development*

The project recommends that universities conduct a review of their existing resources for supervision development. This review should be undertaken with a view to identifying strengths and weaknesses in current provision of resources, and with a view to identifying the additional resources required by supervisors to meet new challenges and demands. Such a review should include the potential for enhancing existing resources, the value of using resources developed at other universities; and the possibilities of making more extensive use of resources such as fIRST.



How the project uses and advances existing knowledge

The project used and advances existing knowledge in a number of ways. These include:

- synthesising the shared expertise, knowledge and experience of symposium participants (experts in the field of research education);
- building on relevant literature in the field (specifically in design of the survey); and
- developing a research design that built consecutively on project outcomes. Thus symposium outcomes informed the development of the survey; which in turn informed the structure and content of interviews.

This project also built on existing knowledge by undertaking a systematic investigation of current practices and perception in regard to research education programs and supervisory practices. To our knowledge no other study of this scale has been undertaken in Australian universities. The research design of the project enables a nuanced picture to emerge of current practices and needs in supervisor training and development in Australian universities, and provides a basis for recommendations that are likely to be of use to these universities.

Critical success factors and impediments

A number of factors contributed to the success of this project, the most important factor being the network of contacts the project team brought with them. This network enabled the project team to identify and invite relevant symposium participants; it also enabled the team to work constructively with DDoGS representatives and to develop procedures for dissemination of the survey, and identification of potential interviewees.

Another factor that contributed to the success of the project was the level of experience that the project team brought to research design, data collection and analysis. Members of the team contributed different but complementary areas of expertise in these areas.

The project team also experienced a number of impediments, primarily in regard to dissemination of the survey, and negotiation of interview appointments.

The survey was large scale and was administered electronically. Administration of the survey relied on the DDoGS representative in each university notifying supervisors of the project and encouraging them to participate. Some DDoGS representatives were more diligent than others in informing supervisors about the project. In addition, however, some universities did not have electronic access to all supervisors and thus the DDoGS representative, despite their willingness, could not contact or easily inform supervisors about the project. Interviews also presented some impediments. Despite considerable help from the DDoGS representative in each of the six universities where interviews were conducted, negotiating suitable times to meet interviewees, especially in focus group discussions, proved challenging.

Despite the impediments that resulted from the specific design of the project, this design was essential to the success of the project. It enabled the research team to access supervisors in universities across Australia and New Zealand in ways that would not otherwise have been possible. As with any project, the specific choices made in the design of this project had advantages and disadvantages.



Dissemination

Dissemination of information about the project and its outcomes has been ongoing throughout the project. It has been undertaken in the following ways:

- feedback to project participants (through separate reports on outcomes of symposium, survey and interviews);
- provision of individual institutional results from the online survey (this enabled institutions to benchmark themselves against national averages);
- publications of separate reports on outcomes from the symposium, survey and interviews on the fIRST website (www.first.edu.au);
- presentations at Quality of Postgraduate Research (QPR) conferences (the team presented a paper at the 2008 and will present another paper at the 2010 conference);
- presentations to the Australian Council of Deans and Directors of Graduate Studies (the team has presented regular reports to the DDoGS on the progress of the project); and
- presentation to International Doctoral Research Education Network, 2010 (Mark Tennant)

Evaluations

This project is itself primarily of an evaluative nature, examining as it does the current position and requirements for research education supervisor development. Because of this, the project team felt that no formal formative evaluation was required. However, at the conclusion of each stage of the project, as indicated, an interim report was published on the fIRST web-site. The various stakeholders were informed of the publications and invited to respond to the report. Thus the main communities involved with the study have been invited to provide ongoing informal feedback at each stage of the project.

In addition, to informal feedback, the project team sent a request to all DDoGS representatives who had received institutional results from the survey (any institution who had over 20 responses were sent a summary of their results). They were asked to indicate ways in which they had used these data. Eight institutions responded to the email. The summary below shows the response of these institutions.



	Total
The results were presented to graduate school board or advisory committee for consideration	5
The results were used directly to inform policy or procedural changes in the graduate school	5
The results were presented to university wide committees for consideration	4
The results were circulated to senior members of the university with interests in supervision development	3
The results were circulated to members of the graduate school for information	2
The results were used directly to inform policy or procedures changes in the university	2

As the above summary indicates, the project has had an impact. The majority of respondents indicated they used the data to inform their graduate board or committees; and that it had informed policy or procedural changes. In some cases the data was referred to senior university committees for consideration and also influenced policies and procedures at an institutional level.

It is the intention of the project team to complete a number of articles that will be submitted for publications in relevant academic journals. Through these, it is hoped that the project will have a wider impact.

Linkages to other projects

This project is relevant to a number of other current ALTC projects and Fellowship programs that are either directly or indirectly related to the area of research education. These include:

- Research graduate skills: The Australian National University (ANU) (<http://www.altc.edu.au/project-research-skill-development-questions-anu-2007>);
- Honours in Australian Higher Education: The Australian National University (ANU) (<http://www.altc.edu.au/project-role-honours-contemporary-anu-2007>);
- Towards a pedagogy of supervision in the technology disciplines: Queensland University of Technology (QUT) (<http://www.altc.edu.au/altc-teaching-fellow-christine-bruce#program-summary>); and
- Development and evaluation of resources to enhance skills in higher degree research supervision in an intercultural context (Macquarie University and The University of Newcastle) (<http://www.altc.edu.au/project-development-evaluation-resources-macquarie-2007>).

During the initial stages of this project, the team organised a joint meeting of representatives from each of the above projects to share information about purposes and methodologies. This meeting and subsequent informal discussions confirmed that the following linkages between projects.



The project on Research Graduate Skills undertaken at ANU addressed the issue of the generic research skills required of research students. While relevant to our project, the issue of generic research skills is one of a number of issues to emerge as important. The issue of generic skills is relevant to supervisors (and to this project) as supervisors need to be aware of the nature of generic skills, and they need to be able to incorporate them into their supervisory practices. The issue is also relevant for research leaders and coordinators who need to ensure that students have opportunities to develop such skills within the research education process as a whole — both during and beyond their interactions with supervisors. A number of recommendations made by this ANU project have direct implications for supervisor training as they address questions regarding the type of support needed by supervisors to ensure that their students are developing appropriate research generic skills.

Although appearing to be peripheral to this project, the ANU study of the position of honours in Australian higher education has some implications. In their survey responses, a number of supervisors expressed concern about the preparation of students prior to undertaking a research degree. Since honours programs frequently provide a route for students into doctoral degrees, the overall quality of honours programs is relevant to supervisors. In addition, many supervise honours as well as doctoral students, and, indeed, supervision of honours students is sometimes regarded as a training ground for higher research degree supervisors.

The issue of pedagogy in supervision was addressed in Professor Christine Bruce's Teaching Fellowship *Towards a pedagogy of supervision in the technology disciplines*, undertaken at QUT. Outcomes from our project indicated that this issue is important to research education as a whole, and it is currently being debated in a number of universities. Questions raised in our project included: is research education primarily about research or about pedagogy; is good supervision primarily a pedagogical practice or is it about initiation into a field of research; and should research education be located in the research portfolio or in the teaching and learning portfolio? Debates about the position of pedagogy in research education underlie many of the current changes in supervisor development, and therefore recommendations from the Fellowship about pedagogy in the technology disciplines are more broadly relevant to other disciplines.

The project on enhancing supervisor skills in an intercultural context addressed an area of central concern of this project: the diversification of research education. Our project outcomes highlighted the increasing cultural diversity of local and international research students (and supervisors), and the impact of this diversity on supervision. The Macquarie University and The University of Newcastle project, like this one, highlights the complexity of intercultural issues; it makes the point that more than communication skills are involved; and it points to the raft of issues that supervisors need to be aware of in their work with diverse students. It also highlights the need for relevant resources to assist supervisors in their work.

While each of the above projects intersects with the outcomes of this project, they do not overlap in any significant way. The two that are perhaps most relevant to ours are the ANU Graduate Skills project and the QUT study of pedagogy of supervision in technology disciplines. The outcomes and recommendations of these two projects, and ours, are therefore summarised in the following table to enable the reader more easily to note the points of intersection and of difference.



Building supervisors capacity (UTS)	Grad skills project (ANU)	Pedagogy in research education in technology disciplines (QUT)
<p>Recommendation 1: Facilitate rich and sustained conversations about research supervision. The project recommends that universities provide additional ways to facilitate opportunities for rich and sustained conversations across academic communities about research education, and that they ensure systems and processes are in place to facilitate and support such conversations.</p> <p>Such conversations would include at least:</p> <ul style="list-style-type: none"> • implications of changes in research degree education for students and for supervisors; • processes for compliance with Quality Assurance standards; • ways of theorising what it means to be a supervisor; • the nature of good supervision practices, including insights from cross disciplinary, cross institutional discussions and • specific strategies that support supervisors in their work with students. <p>The project also recommends that such conversations, and the systems and processes that support them, be located at both local (faculty) and Central levels, and that they include cross disciplinary and cross institutional perspectives;</p> <p>Recommendation 2: Further support and develop leadership in research education</p> <p>The project recommends that universities enhance their leadership in research education at central and local levels, (e.g. Graduate School and at local/faculty levels). At the central level, leadership could be enhanced by more systematic coordination across universities of all activities pertaining to research education and professional development for researchers.</p> <p>At the local/faculty level, leadership could be enhanced by:</p> <ul style="list-style-type: none"> • recognising the increasingly important role of research degree coordinators in leading and supporting supervisor development at the local level within (and between) faculties, and providing appropriate resources and support to enable these coordinators to be proactive in this area and • developing and coordinating systematic mentoring programs that function within and between faculties <p>Recommendation 3: A project on leadership in research education.</p> <p>The project commends ALTC for its support to date for research education and recommends that it consider making research education a priority issue for the future. Further, the project recommends that ALTC commission a</p>	<p>Follow-up research on employer expectations It is recommended that:</p> <ul style="list-style-type: none"> • further research be conducted to generate a more accurate understanding of the current and emerging expectations of groups who employ HDR graduates; • the target audience for this research would constitute a diverse range of professional, government, commercial and other interest groups to identify contemporary HDR skills deemed to be of critical importance in the selection of research graduates (Note that discussions have already commenced with the Australian Deans and Directors of Graduate Studies); • links be established with relevant research and development projects with a view to drawing on significant data sets such as PhD graduates five to seven years out: Employment outcomes, job attributes and the quality of research training (2007), and • peak employer and industry bodies such as ACCI, BCA and AIG be approached with a view to becoming actively involved in the implementation and/or dissemination of the findings arising from this research. <p>It is recommended that:</p> <ul style="list-style-type: none"> • research be conducted to explore the concept of contextualised performance in authentic settings; • a major focus of this research be on the assessment and reporting of the performance and demonstrated capability of HDR candidates and graduates in multiple contexts (i.e. rather than focusing on research graduate skills per se); • links be established with relevant research and development projects to exchange the findings and implications arising from recent research (e.g. quantitative—Graduate Skills Assessment Test; and qualitative—case studies of contemporary HDR practice); and 	<p>Create opportunities for supervisory conversations around pedagogy, to promote communication about supervision as a teaching and learning practice</p> <p>Promote a vision of pedagogical excellence in supervision as a critical element of quality in research training.</p> <p>Adopt, and adapt where required, the pedagogical framework and supporting resources as development tools for supervisors.</p> <p>Seek deeper understandings of the higher degree research curriculum as seen from supervisor and student perspectives.</p> <p>Further develop the pedagogy of supervision framework within the disciplines of IT and Engineering.</p> <p>Adapt and develop the pedagogy of supervision framework in relation to other disciplines</p> <p>Make the Pedagogy of Supervision framework available to technology supervisors as part of the Student Research Centre standard suite of resources</p> <p>Link existing 'graduate capability statements' with expressions of learning outcomes using the words of supervisors from the technology disciplines, to assist with supervisor buy in to the agenda.</p> <p>Consider supporting a large scale survey of the views and practices of individual supervisors in relation to graduate capabilities, as suggested by Borthwick and Wissler (2003, p.10).</p> <p>Create development opportunities for less experienced supervisors,</p>



Building supervisors capacity (UTS)	Grad skills project (ANU)	Pedagogy in research education in technology disciplines (QUT)
<p>project specifically on leadership in research education and that this project address ways in which universities can develop and implement models of distributive leadership in research education. Such a project would support universities to enhance research education leadership at both central and local/faculty levels.</p> <p>Recommendation 4: Ensure systems, guidelines and regulations keep pace with the changing nature of research education.</p> <p>The project recommends that universities review their own systems, guidelines, rules and regulations regarding both supervision and thesis examination to ensure:</p> <ul style="list-style-type: none"> • they are relevant to increasingly diverse interdisciplinary and non-traditional research education projects; • they keep pace with pressures for increasingly interdisciplinary and non-traditional research education projects, and • they provide relevant and appropriate guidelines for both supervisors and thesis examiners in regard to interdisciplinary and non-traditional projects, and their forms of presentation. <p>Recommendation 5: Further address the impact of growth and diversity on supervisors and provide further support.</p> <p>The project recommends that universities further address the impact of diversity on research supervisors and the additional challenges they face as a result of:</p> <ul style="list-style-type: none"> • diverse geographical locations of supervisors and their students; • working with culturally and linguistically diverse students; • supervising interdisciplinary projects and • working with students who are experiencing difficulties or problems. <p>Such challenges could be addressed by ensuring structures and resources are in place to support supervisors in their work with diverse students and in diverse modes of study by, for example:</p> <ul style="list-style-type: none"> • addressing specific challenges within the professional development programs provided for supervisors, with appropriate follow-up support; • providing specific support mechanisms (beyond risk minimisation) for supervisors working with students experiencing difficulties (or for students working with supervisors who are problematic). <p>Recommendation 6: Strategies for addressing academic literacy in research education be improved.</p> <p>The project recommends that the higher education sector</p>	<ul style="list-style-type: none"> • stakeholders in research graduate skills development (e.g. ALTC, Universities Australia, CAPA, ACER) be approached to become involved in the implementation and/or dissemination of the findings arising from this research. <p>It is recommended that:</p> <ul style="list-style-type: none"> • a national forum on research graduate skills be conducted to share critical outcomes and processes from contemporary research and development projects; • primary objectives be determined in consultation with key stakeholders (e.g. moving towards a common language and terminology for graduate skills; improving the quality of skills training and development); ALTC might like to consider using the Quality in Postgraduate Research 2010 conference as an option for such a forum. • the ALTC consider building on the outcomes of forums conducted previously to promote information exchange (e.g. the Graduate Attributes Project, The University of Sydney); • links be established with other relevant research and development projects and initiatives with a view to identifying resources and outcomes; • stakeholders in research graduate skills development (e.g. ALTC, Universities Australia, CAPA, ACCI, BCA, AIG) be approached to become actively involved in the implementation and dissemination of the proposed forum. 	<p>such as quarterly meetings of members of this community, to discuss supervisory issues and strategies</p> <p>Increase support for supervisors and students; for example, by creating positions that will help supervisors and students achieve aspects of the higher degree research capability agenda.</p> <p>Request technology (and other) faculties to work with supervisors and students to adapt university higher degree research graduate capabilities to the faculty's disciplinary context, for instance by providing examples of planned learning outcomes that relate to each capability within the faculty context</p> <p>Establish faculty level awards for excellence in higher degree research supervision.</p> <p>Propose faculty or school level awards for excellence in higher degree research supervision and identify markers of excellence, including clarity of pedagogical intent</p> <p>Formally establish mentors for less experienced supervisors, especially supervisors without completions experience.</p>



Building supervisors capacity (UTS)	Grad skills project (ANU)	Pedagogy in research education in technology disciplines (QUT)
<p>and individual universities further acknowledge and provide resources to address the challenge faced by many research students (both international and local) and their supervisors in regard to academic literacy.</p> <p>ALTC and the higher education sector could do this by:</p> <ul style="list-style-type: none"> • commissioning a project to clarify questions regarding roles and responsibilities of supervisors regarding support for students' academic literacies. Such a project, with reference to DDoGS guidelines on best practice, could provide guidelines in this complex area. It could also develop guidelines regarding the kind of professional knowledge of academic literacy required by supervisors. <p>Individual universities could do this by:</p> <ul style="list-style-type: none"> • in addition to centralised resources, providing further discipline specific resources for students at the local/faculty level for teaching English for Academic Purposes (EAP) and • providing appropriate professional development and resources to increase supervisors' own professional knowledge of academic literacy, and knowledge of how to support their students in academic literacy. <p>Recommendation 7: Address pressures on supervisors by identifying and responding to supervisors' major concerns in supervision.</p> <p>The project recommends that universities address the increasingly complex roles and skills required of supervisors by:</p> <ul style="list-style-type: none"> • ensuring strategies are in place to provide different levels of support for supervisors at point of need: from peers; from mentors; from department or Unit leaders; and where relevant, from those responsible for conflict resolution; • ensuring research education leaders have resources and support to develop and implement such strategies. <p>The project also recommends that studies are undertaken within individual universities to identify supervisors' specific priorities and concerns, and that additional relevant measures are put in place to address these.</p> <p>Recommendation 8: Acknowledge pressure of supervision when negotiating supervisors' workloads</p> <p>The project recommends that, when negotiating supervisors' workloads, universities take account of:</p> <ul style="list-style-type: none"> • the need to balance supervision with other academic duties (of teaching and research); • the number of research students that are desirable for one supervisor, in relation to the supervisor's other responsibilities; • the weighting of roles of principal and associate/co supervisors in workloads, and; 		



Building supervisors capacity (UTS)	Grad skills project (ANU)	Pedagogy in research education in technology disciplines (QUT)
<ul style="list-style-type: none"> the time required for supervising students who are experiences specific challenges. <p>Recommendation 9: Review of existing professional development programs to ensure they address the needs of supervisors.</p> <p>The project recommends that universities review their own procedures to ensure they have in place systematic and structured programs for the induction of new supervisors. Such programs should include:</p> <ul style="list-style-type: none"> some centralised and formal component some local component (this is what especially needs to be strengthened) and; systematic mentoring programs that include peer support, as well as mentoring between less and more experienced supervisors. <p>The project also recommends that universities rethink strategies for ongoing development of experienced supervisors by including reactive, pre-emptive and proactive dimensions within their supervisor development programs that will enable them to:</p> <ul style="list-style-type: none"> seek more innovative and creative solutions to supervisor development beyond the standard course workshops; balance allocation of expertise and resources between central and local programs; tie the requirement for formal registration of supervisors to faculty-based programs on professional development; introduce a mentoring program (with benefits for both less and more experienced supervisors) and allocate resources to facilitate and support other informal supervisor learning opportunities that foster ongoing discussions about supervision. <p>The project also recommends that universities consider further developing and implementing modules on supervision in existing postgraduate higher education teaching programs.</p> <p>Recommendation 10: Review of existing and future resources for supervisor development</p> <p>The project recommends that universities conduct a review of their existing resources for supervision development. This review should be undertaken with a view to identifying strengths and weaknesses in current provision of resources, and with a view to identifying the additional resources required by supervisors to meet new challenges and demands. Such a review should include the potential for enhancing existing resources, the value of using resources developed at other universities; and the possibilities of making more extensive use of resources such as FIRST.</p>		



Report from the symposium of experts and scholars

In this and the following two sections of the report, details of outcomes from analysis of different sources of data in the project are presented. Similar versions of these sections have previously been published on the fIRST website (www.first.edu.au) and have been made available to participants in the project. The purpose of this section is to present outcomes from the symposium discussion.

As indicated earlier, the symposium represented the first stage of the project. It brought together an invited group of key academics who are recognised as experts in the field of higher education and supervision. The purpose of the symposium was to outline broad issues that would subsequently inform the scoping exercise to be undertaken later in the project. As indicated, the symposium program was organised around six major topics that were central to the concerns of the project.

- What is the future nature and purpose of the doctorate?
- What is the role of supervision in doctoral education?
- How will the increasing accountability of universities affect doctoral education?
- What is the current state of research supervisor education?
- What are the implications of the growing diversity of candidates and supervision arrangements?
- What is the agenda for future research education?

A team leader and co-presenters provided input for each of the sessions and then general discussion was invited from all symposium participants. The summary that follows identifies key issues that emerged from discussion across the six symposium sessions. Thus it attempts to identify the broader issues that emerged from the symposium as a whole, rather than the details of discussion in any one of the sessions.

Major themes to emerge from the discussion

The 'space' occupied by research education

Discussion in symposium sessions highlighted tensions inherent in the nature of research education where the supervisor is both teacher and researcher, and where research students are students but also researchers. As participants noted, research education occupies a 'hybrid space' between teaching, learning and research, where students are required to be independent and autonomous, but are also required to accept guidance and to respond to feedback. Supervisors are required to support students' developing independence, but also to ensure their progress towards completion of the research degree stays on track. Balancing multiple roles is a complex task for both supervisors and students.

Symposium participants pointed out that the complexities of roles of supervisors and students have considerably increased in response to the changing place of knowledge in contemporary society. A society that emphasises a 'knowledge economy', where future economic performance is seen as linked to the development of a skilled and innovative workforce, and where individuals within that work force are seen as 'knowledge workers', has major implications for research education. Such a society challenges traditional notions of research contributing to the stock of disciplinary knowledge, and of universities as communities of individual and autonomous scholars. It also challenges traditional assumptions about research education. As one participant



argued, in such a world, research education becomes a site of tension regarding what constitutes legitimate knowledge, and regarding the ways in which skills and attributes of the new knowledge worker are produced.

Symposium participants pointed to the need for universities to think more broadly about the total environment for higher education and the roles of all players within the 'ecosystem' that is research education. They also pointed to the need to think about the nature of learning at doctoral levels and to what it takes to achieve independent original thought.

Competing pressures in research education

In the context of a world that challenges traditional notions of knowledge and of scholarship, the symposium discussions identified a number of competing pressures on research education. Research education can be seen as a way of contributing to national innovation and economic development. Graduate students, as likely future research leaders in science, industry, technology, and other professions, can contribute to the national economy and to the nation's competitive edge in international markets. As a result, there is pressure at national and university levels for growth in doctoral programs, and for programs that attract high quality students and equip them to participate in a global knowledge-based society. And in order to equip students for such a society, there is pressure for research programs to address issues of employment, interdisciplinarity, development of flexible skills, creativity and innovation.

At another level, in order to ensure greater efficiency and 'quality control' there is pressure for compliance in research education. Supervisors are increasingly required to comply with regulations that are imposed by governments, universities and individual faculties that aim to ensure greater consistency in students' experiences as research students, and greater efficiencies through improved retention and reduction in completion times. University regulations are also designed to reduce risk – especially of student complaints and litigation.

As symposium participants pointed out, tensions exist between pressure on one hand for expanded creative and innovative doctoral programs that cater to the needs of diverse students, while on the other for increasing conformity to uniform processes, standards and outcomes. Getting the balance right between risk-taking and risk-minimising in research education requires fine judgment. It also places considerable pressure on supervisors to make assessments about 'how much risk' is possible or appropriate, and about accountability and responsibility in their work with research students.

Diversity in research education

As many symposium participations noted, diversity is a major factor in their experiences of research education. Diversity, they noted, is evident on a number of levels:

- Research students themselves are considerably more obviously diverse than in previous years. With the "massification of doctoral programs" as one participant described it, and with pressure on universities to become more cost effective, there has been a substantial increase in numbers of international research students. The local student population has also become more diverse, with a broader age mix of students; a higher proportion of women; and a greater number of students from diverse socio-economic backgrounds represented in doctoral programs than was previously the case. Diverse cohorts of students contribute to the social, linguistic and cultural diversity of faculties and, of course, international students also contribute financially through their substantial fees. However, this diversity also brings challenges, most notably in



concerns about maintaining standards and quality – and hence contributes to the pressures noted above towards regulation and conformity of systems, procedures and outcomes. Some symposium participants pointed out that the enrolment of diverse students also raises the issue of academic English – and the need for support for both students and supervisors here.

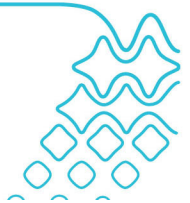
- Research education programs are also increasingly diverse in forms of provision. In addition to traditional PhD by thesis, most universities also offer professional doctorates, and some offer diverse curricula within doctoral degrees. Students are able to study in full-time or part-time mode; they are able to study as distance students. Cross-disciplinary research is becoming more common, and non-traditional theses are more acceptable with the result that more diverse products now serve as doctoral theses.
- Research reported by symposium participants provides evidence that students enrolled in different modes experience different levels of satisfaction with their candidature, with those in part-time and distance modes or in professional doctorates generally recording lower levels of satisfaction than full-time students. Symposium participants noted there is frequently overlap in diversity of programs and of students. For example, the predominant profile of part-time students (now the largest group of research students) is that of active professionals in their thirties or forties who see completion of a doctorate as a way of impacting on their profession. Additionally, many students inhabit global, digital worlds to which supervisors may have limited access. This marks a substantial change from previous student profiles of younger, full-time students who complete a research degree in order to pursue a career as researcher or as an academic. As symposium participants pointed out, available research evidence suggests the mind-set of universities has not changed sufficiently to satisfactorily accommodate the diversity of students and doctoral programs.

Implications for the changing nature of research education

The traditional model of research education is that of a master-apprentice relationship, with the supervisor (master) guiding the student (apprentice) towards completion of a thesis. While development of a student's capacity as a researcher has always been embedded in the goal of thesis completion, the extent to which this goal was prioritised varied within individual and often idiosyncratic relationships between supervisors and students.

Factors outlined above – of new modes of knowledge production, of the hybrid space that is occupied by research education, of competing pressures on research education and of its increased diversity – have all contributed to changes in the context in which research education is located. They also present challenges to traditional ways of thinking about the nature of research education. Some symposium participants argued that the notion of an independent autonomous scholar is no longer an ideal to which doctoral programs should aspire. The new knowledge economy, they argued, requires workers who are skilled in collaboration and negotiation; who operate flexibly in a global and digital world and who can develop creative solutions to problems on the basis of available information. Thesis completion and development of specific research skills remain important in research education – students are still primarily assessed on the basis of successful completion of a thesis. However, as symposium participants pointed out, the changing context of research education, and pressure to think beyond the thesis, have shaped new ways of thinking about the doctoral enterprise by some scholars and by some students and their supervisors.

Universities in Australia and elsewhere have engaged with new thinking about research education in various ways. Most universities and faculties provide programs for students in the form of seminars and workshops designed to support students'



understanding of research and specific research skills (indeed many symposium participants are involved in design and implementation of such programs). These programs however are usually seen as additional to the main task of completion of a thesis. More radical responses have been to begin to reconceptualise the goal of research education. Some universities now have lists of graduate attributes that identify various attributes, competencies and skills that students are expected to develop during their candidature (although thesis completion appears to remain central to successful completion of doctoral degrees). Others now accept greater diversification of products that count as theses.

Discussion in the symposium suggested that ways of thinking about the doctoral enterprise are very much ongoing and unresolved. Symposium participants pointed out that discussions (and disagreement) about purposes of doctoral degrees occur not only at university level, but also between disciplines, and between students and supervisors. Participants identified the following range of purposes in this discussion:

- preparation of employment ready researchers (including the interdisciplinary and intercultural skills that are needed for employment in a global digital world);
- preparation for research leadership (and ways of identifying and supporting potential leaders); and
- engaging in professional development (evidence from responses to a survey reported at the symposium suggest most students see professional development as the major purpose of their doctoral studies. They also see their goals in broad terms, beyond simply preparing for employment, as tapping into a broad range of organizations and individuals within and beyond academia).

Such discussions clearly challenge traditional models of research education. They also raise questions about the nature of student–supervisor relationships and the changing (additional) roles of supervisors in research education.

Implications for the changing role of supervisors and expanding nature of supervisory skills

One outcome of the new thinking about research education has been recognition that research students' activities go beyond completion of a thesis and engage people other than their supervisors. Symposium participants pointed to students' participation not only with research cultures within the universities and faculties where they were studying, but also to engagement with national and international networks, with community and professional colleagues, and with fellow students.

However, despite all the changes in thinking about research education, and despite recognition of the multiple links and relationships in the lives of research students, symposium participants also noted the resilience of the one-to-one student–supervisor relationship. In the view of many of the participants, at least to this point in time, the student–supervisor relationship remains the central component in students' successful completion of a research degree, though there is a strong need for multiple relationships to be formed.

- So what does this mean for the role of supervisors and for the skills that they are required to bring to their work with research students?
- The 'unfinished' nature of discussions about the role and purposes of research education appear to be reflected in the multiple and at time conflicting roles that the supervisor is expected to undertake. So in one sense the supervisor is caught in the middle of a field that is in flux.



Symposium participants noted that supervisors still need to support students through their knowledge of the discipline/content area of the students' thesis; through their knowledge of research design and methodology; and also through the relationship they develop with their students. However, the changing context has raised a number of (as yet unresolved) questions about the role of supervisors and the kinds of skills that they need to bring to the process of supervision. These include:

- Who is in charge of the project that is the student's candidature? Is it the supervisor or the student? Who is the 'project manager', and does this change during the life of the student's candidature? What levels of independence within the project are desired or can be expected of students?
- What understanding of nature and purposes of candidature is the supervisor working with, and do the supervisor and student share similar understandings of this enterprise?
- How should the supervisor balance roles of providing research training, teaching research students in areas of discipline knowledge, and administering the student's candidature?
- What is meant by 'good' disciplinary supervision? Should the supervisor place a stronger emphasis on networking, on students' abilities to interact with others, with communication and team-work? Is there a need for mobility, adaptability, responsiveness and global thinking on the part of the supervisor, and for such attributes to be fostered in the supervision process?
- Should the supervisor be expected to be involved in cross-disciplinary supervision? What issues arise when supervising with colleagues from other disciplines?
- How should the supervisor respond to pressures for risk management? How much of their time should be allocated to compliance with systems and procedures? Does this mean they should not supervise 'risky' students? How should they balance risk, creativity and complexity in research education, and in their supervision of students?
- Should supervisors have a range of responses to working with diverse students (should they reject a 'one size fits all' approach to supervision)?
- How can supervisors develop the ability to be adaptive and flexible in their supervision while also justifying their professionalism and conforming to 'measures' of good supervision?
- What are implications for supervisors' workloads of the massification and diversification of doctoral education? How many students can realistically be supervised by the one supervisor? Can students be supervised in groups or teams?
- Who else should be involved in supervisory work, and how can the involvement of others be managed?
- Is the supervisory role more effective when undertaken by panels? If so, how should these be organized, and how do supervisors cope with the additional workload that accompanies supervision panels?



Implications for nature and challenges of research supervisor training

What are implications of all of the factors above for research supervisor training? For those involved in the development and implementation of such training there are a number of challenges.

Research supervisor training is typically funded and supported as part of universities' concerns with timely and cost effective completion of higher research degrees. On the one hand, the aim of research supervisor training is to contribute to the overall professionalism of supervision by providing pedagogical support for supervisors, and assisting them to develop greater awareness and skills in their own supervisory practices. On the other hand, research supervisor training provides a way for the university to monitor supervisory practices, to ensure greater compliance with university systems and policies, and to minimise risk. Those responsible for developing and implementing research supervisor training must negotiate the space between the 'carrot' of providing pedagogical support for supervisors, and the 'stick' of monitoring their practices and ensuring compliance and risk minimisation.

Symposium participants involved in research supervisor training tend to prioritise the pedagogical 'carrot' in their work. They aim to create an environment where supervisors want to be involved and where supervisors are drawn into the scholarly community of those involved with research education. They also aim to create the kind of good will that will encourage supervisors to be open to further, and more challenging, training. But they are clearly aware of the challenge here, and describe research supervisor training as a 'devilish thing' that needs to be both light and engaging. They point out that this training needs to work within the culture of the institution and the specific culture of individual disciplines and faculties. Thus they need to balance training that can occur centrally at an institutional level with training that needs to be at a faculty or department level. They point to the dangers of making research supervisor training compulsory and the backlash that may result. They also point to the advantages of research supervisor training that is 'just in time' and that enables supervisors to engage with issues at the point when they most need support. They note that research supervisor training is often targeted to early career researchers who are new supervisors, but recognize that demands of such training need to be balanced against other demands faced by new supervisors.

A further challenge for those involved in research supervisor training arises from the difficulty of assessing its effectiveness. While determining the success of research supervisor training is important, the challenge lies in establishing appropriate criteria for success. Possible criteria include: numbers of supervisors who complete programs; positive evaluations from participants; evidence of a cultural change in the nature of supervision; and evidence of the development of reflexive practitioners who challenge their own practices. Some criteria are easier to measure than others but less useful in determining overall effectiveness and success.

In the complex and changing field of research education, the challenges faced by those involved with research supervisor training are not likely to disappear and are not easy to resolve.



Report from the survey of research supervisors in Australia and New Zealand

This is the second of three sections where outcomes from analysis of data are presented. The purpose of this section is to present outcomes from the survey that was conducted in the project with research supervisors across all universities in Australia and New Zealand. A version of this section has previously been published on the FIRST website (www.first.edu.au).

As indicated, the purpose of the survey was to seek information from practising supervisors across all universities in Australia and New Zealand about their existing supervision practices, the resources they use in supervision, and their perceived future needs in research education and supervision. The survey questions were organised around the following Sections:

- Section 1: About the supervisor: background information about supervisors' academic disciplines and their levels of experience in supervision;
- Section 2: Research Supervision practices: supervisors' priorities in their work as a supervisor, and their own supervision practices;
- Section 3: Development and support of supervisors: supervisors' views on what shaped their development as a supervisor and their views on the nature of support that will facilitate effective supervision; and
- Section 4: Views on the nature of research and future directions: supervisors' views on research and on being a researcher, their views on future directions of doctoral research.

As also indicated, in developing the survey the project team drew on outcomes from the symposium as well as research in related areas. Some questions were designed deliberately to build on specific research to enable comparisons between survey responses and outcomes from that research. The following authors gave permission for their work to inform these questions: Orrell & Condon (2004) Q6; Pearson & Kayrooz (2004) Q7; Pearson & Brew (2002) Q8; Åkerlind (2008) Qs12, 13 & 14.

Development of the survey involved processes of drafting, revising and piloting of questions. The final version of the survey was made available electronically, via a University of Technology, Sydney (UTS) based survey design and implementation tool. To encourage maximum participation, initial discussion of the project occurred at a meeting of the Deans and Directors of Graduate Studies (DDoGS). An invitation to participate in the survey was then emailed to the DDoGS representative at each university, who was asked to pass on the invitation to all supervisors in their university. The DDoGS representatives were also asked to send out a reminder email to supervisors. Electronic access to the survey was available for eight weeks. (See Appendix 1 for a copy of the survey questions.)

Analysis of responses to the survey first involved downloading data from the UTS site. Responses to closed questions were analysed quantitatively using SPSS and Microsoft Excel. Survey items in Sections 2, 3 and 4 were given a score on a range of one to five (e.g. *not at all useful* – *very useful*, where *not at all useful* was given a score one, and *very useful* was given a score of 5). Means were then calculated for each item for the overall population. Items were also analysed against independent variables (of discipline, supervisor experience and category of university), and were tested using independent-sample t-tests. Results from this analysis are only used in this report



(unless otherwise stated) where they had a significance level below 0.05 (e.g. $p < 0.05$) and therefore could be considered as statistically significant.

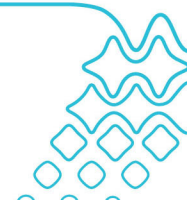
Responses to open ended questions were analysed qualitatively using content analysis to identify major recurring themes and issues. The number and length of responses to open ended questions (around 1600 responses to each question) led the researchers to decide first to undertake a detailed analysis of the first 200 responses in order to identify and code major themes and issues in relation to each question, and thereafter to analyse every 10th response to confirm the stability of codes. Numbers of responses were also recorded to provide insights into the priority accorded to each code.

Survey response

A total of 47 (from a possible 50) universities participated in the survey of research supervisors. A total of 1884 responses were received. We estimate this represents responses from approximately ten percent of the overall supervisor population in Australia and New Zealand. These 1884 responses form the basis of analysis and outcomes presented in this section.

To determine the extent to which the survey population was representative of the general population, an analysis of the Australian survey population by Australian Standard Classification of Education (ASCED) Broad Field of Study was undertaken, and results compared with the distribution of the Broad Field of Study (BFOS) of the Australian doctoral student population (DEEWR 2007a), (no comparable data were available from New Zealand). Our expectation was that supervisors would have a similar disciplinary distribution to their students, and that therefore the two distributions should be similar. (No national data are available for categorisation of staff disciplines.) While the results showed a slight over-representation of survey participants in Health, and a slight under-representation in Engineering and Technology, the overall distribution was very similar, suggesting that the survey population can be considered as representative of the general population of supervisors across disciplines.

An analysis of the survey population in terms of participant's institutions and gender was also undertaken. The analysis based on the participants' institutions showed that 76.4% of participants were from Australia and 23.6% were from New Zealand (Table 3). This contrasts with the doctoral student population where Australian students represent 86.7% of the total Australian and New Zealand population (DEEWR, 2007a, Education Counts, 2007). While, proportionally, Australian supervisors were slightly under-represented in the survey and supervisors in New Zealand were slightly over-represented, the differences were not so large as to distort the overall survey responses. The gender split for the survey populations was 44.2% women, 53.9% men (2% did not identify their gender) (Table 1 in Appendix 2). This compares with a split of 41.5% women and 58.5% men in the general Australian academic staff population (DEEWR, 2007b). Thus, despite small differences in discipline distribution, gender and representation in supervisors from Australian and New Zealand, the survey population can be considered as broadly representative of the general population of research degree supervisors.



About the supervisors

Section 1 of the survey sought information about supervisors' disciplines, their current supervision loads and their levels of experience as a supervisor.

Distribution of current supervision duties

Survey responses showed that most supervisors have multiple supervision roles. Ninety three percent of the survey population were supervising at doctoral level. Of these 51.5% were supervising only doctoral students, while an additional 41.8% were supervising both doctoral and masters students (Table 4). Slightly fewer than 4.2% were supervising at Masters level only, and 2.4% were not currently supervising at the time they completed the survey. Most supervisors were also both principal and associate supervisors. The largest group were doctoral principal supervisors (73.8%), followed by doctoral associate supervisors (73.3%) (Table 6).

Supervision workloads

The average number of students being supervised by individual supervisors can be estimated from the survey, but because individuals can undertake multiple roles the research team decided to focus only on principal supervisors who were currently supervising students at the time of the survey. These individuals are referred to in this report as 'active principal supervisors'. As indicated earlier, active principal supervisors were further classified according to experience as New Supervisors; Experienced Supervisors; and Very Experienced Supervisors.

On average, supervision loads for active principal supervisors (Table 7) were:

- principal supervisor of 3.02 doctoral students;
- associate supervisor of 1.83 doctoral students;
- principal supervisor of 0.73 masters students; and
- associate supervisor of 0.33 masters students.

Thus the average number of higher degree by research (HDR) students supervised by active principal supervisors was 5.91.

The actual number of students being supervised varied in relation to the experience of individual supervisors. New Supervisors averaged 1.99 doctoral students as a principal supervisor, while Very Experienced Supervisors averaged 4.28 doctoral students.

There was some variation between institutional groups in the number of students being supervised. Supervisors in the ATN group had the highest average number of HDR students per active principal supervisor (6.52) while those in the IRU group had the lowest (5.64) (Table 8).

The average number of HDR students per active principal supervisor also varied with the ASCED BFOS. Supervisors in Creative Arts had the highest average (7.52), while Management and Commerce had the lowest with (5.40) (Table 9). Supervisors in Architecture and Building had the highest average of doctoral students (5.53) while supervisors in Engineering and Related Technologies had the lowest (4.21).



We took a different approach to the analysis of completions of research degrees with the average number of students in relation to types of supervision as the unit of analysis. Student completions can be summarised as follows (Table 11):

- average number of doctoral students supervised to completion by principal supervisors: 2.64;
- average number of doctoral students supervised to completion by associate supervisor: 1.81;
- average number of masters students supervised to completion by principal supervisor: 2.34; and
- average number of masters students supervised to completion by associate supervisors: 1.21.

An analysis that focuses only on doctoral students supervised to completion by principal supervisors ('principal doctoral completions') enables a comparison of completions across groups of universities and across disciplines. Supervisors in the Go8 universities had the highest average number of principal doctoral completions (2.98), while those in Other Australian universities had the lowest (2.64) (Table 12). Number of principal doctoral completions also varied in relation to discipline, with Psychology and Cognitive Sciences having the highest average (3.58) and Law and Legal Studies the lowest (1.55) (Table 13).

Overall 43.0% of the survey participants had no doctoral completions as a principal supervisor (Table 14). Of the active current principal supervisors 37.4% (N=393) had no doctoral completions as a principal supervisor (that is, they were New Supervisors) (Table 15). Of this group it appears that 60.6% (N=238) had not first supervised a doctoral student to completion as an associate supervisor before becoming a principal supervisor (Table 16). Thus the notion of academic apprenticeship whereby a New Supervisor first supervises a student to completion as an associate supervisor does not seem to apply in the majority of cases. This finding may partly reflect a relatively recent emphasis on academic apprenticeship, however, it appears to be common across all categories of universities and disciplines.

Research supervision

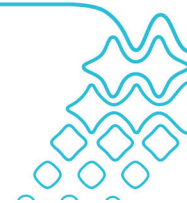
Section 2 of the survey asked participants about priorities in their work as a supervisor and about their own practices as a supervisor. There were two questions in this Section.

The first question in this section (**Q6**) asked participants to indicate the priority (low to very high) they accorded to nine listed supervision practices. This question drew on the work of Orrell & Condon (2004).

Average rating of items ranged from 2.83 (lowest) to 3.62 (highest).

Items that were rated as highest priority were:

- *Providing feedback to my students within an agreed time* (3.62); and
- *maintaining a productive relationship with my students over the entire period of their candidature* (3.57).



Items that were rated as lowest priority were:

- *facilitating wider academic contacts and networks for my students (2.83); and*
- *having skills to attend students who are more than usually demanding (2.87).*

Level of supervisor experience (New, Experienced and Very Experienced) had some impact on supervisors' priorities, with Very Experienced supervisors according slightly higher priority to a larger number of factors than those with less experience. All categories of supervisors accorded highest priority to *providing feedback to my students within an agreed time*. Lowest priority for Very Experienced supervisors was *having skills to attend students who are more than usually demanding*, while for New and Experienced supervisors' lowest priority was *facilitating wider academic contacts and networks for students*. Overall, however, these differences were not large.

Discipline difference also had some impact on supervisors' priorities. Supervisors in Social Sciences gave more priority to *providing feedback to my students within an agreed time* than those in the Natural Sciences (e.g. Education: 3.75 and Natural and Physical Sciences: 3.52). Those in Agriculture (3.56) and Education (3.53) placed higher priority on *capacity to advise my students on academic writing* than Engineering (3.24). One of the lowest scoring items, *having skills to attend students who are more than usually demanding* was lowest in Management and Commerce (2.74), but highest in Creative Arts (3.07) and Education (3.03). This perhaps reflects the challenges of supervising diverse students in humanities and social sciences. Overall, however, discipline differences were smaller here than for other questions.

The second question in Section 2 (**Q7**) asked participants to identify the frequency with which they employed a range of 40 supervisory practices. The items in this question were based on those used by Pearson & Kayrooz (2004) who asked students to identify the frequency with which their supervisors used these practices. Outcomes from this question provide the possibility of comparing supervisors' and students' perceptions regarding the nature of supervisory practices.

It is worth noting that overall means for all items in this question were high. Means for items ranged from 4.63 (highest) to 3.25 (lowest). Thus most supervisors indicated that they frequently undertook many of the 40 activities that were listed in this question.

Activities most frequently undertaken were:

- *carrying out duties in a professional manner (4.63);*
- *being approachable, responsive and affirming to your students (4.60);*
- *encourage students to develop and evaluate their own ideas as you discuss what they are doing (4.59);*
- *ensure official requirements are met (4.55);*
- *respect knowledge and expertise students bring to their candidature (4.54); and*
- *help students plan and refine viability of their project (4.51).*

Activities least frequently undertaken were:

- *advising on issues related to Intellectual Property Rights (3.25);*
- *introducing students to professional networks (3.39);*



- *periodically review your supervisory process and interaction with students (3.45);*
- *initiate contact with your students (3.52);*
- *encourage students to network within the university (3.61);*
- *assist your students to progress their career goals (3.64); and*
- *direct your students to leading researchers (3.70).*

Disciplinary differences had some impact on responses to this question. These differences were relatively small in the most frequent activities. For example:

- *carrying out duties in a professional manner: Society and Culture: 4.72 (most frequent); Engineering: 4.52 (least frequent); and*
- *respect the knowledge and expertise your students bring to their candidature: Architecture and Building: 4.73 (most frequent); Agriculture: 4.36 (least frequent).*

However, disciplinary differences were more evident with the least frequent activities. For example:

- *advising on issues related to Intellectual Property Rights: Creative Arts: 3.98 (most frequent); Agriculture: 3.06 (least frequent); and*
- *introducing students to professional networks: Architecture: 3.70 (most frequent), Management: 2.90 (least frequent).*

Outcomes from this question indicate that supervisors spend most time in professional interaction with students around the thesis (being approachable and responsive; developing ideas; meeting requirements; respecting knowledge; refining viability of thesis). Here there are few disciplinary differences. They spend less time on issues beyond the thesis (e.g. Intellectual Property Rights (IPR), networks, or career goals) or reviewing the supervisory process. However, here disciplinary differences are more obvious.

The level of supervisor experience had an impact on responses to this question. The more experienced the supervisor, the more likely the supervisory practices were to occur.

The greatest differences between Very Experienced and New supervisors occurred in:

- *Introducing students to professional networks (3.65/3.21);*
- *Assisting student to progress career goals (3.87/3.46);*
- *Assist student to formulate research topic (4.30/3.89);*
- *Assist student to obtain resources for conferences (4.20/3.80); and*
- *Help arrange for students to present work at seminars/conferences (4.44/4.04).*



Lowest differences were:

- *Respect knowledge of students (4.58/4.48);*
- *Being approachable (4.65/4.55);*
- *Directing students (4.30/4.16); and*
- *Initiating contact with students (3.58/3.44).*

The majority of items in this question showed a statistical difference (although often small) between categories of universities. For example:

- IRU most likely (4.08) to *negotiate availability with students*, Go8 least (3.64);
- ATN most likely (4.71) to *carry out supervisor duties professionally* Go8 least (4.58); and
- Go8 most likely (4.52) to *encourage publication during/on completions*, New Zealand least (4.15).

Development and support of supervisors

Section 3 of the survey asked participants their views on what shaped their development as a supervisor, and on the formal or informal support that is necessary to develop supervisors capable of effective supervision of research students. There were four questions in this Section.

The first of these questions (**Q8**) asked participants what had influenced their own development as a supervisor. They were required to mark as many as they wished of nine items listed in the question. They also had the opportunity for additional open-ended comment. This question drew on the work of Pearson & Brew (2002).

Of the listed items, the ones marked by the highest proportion of participants were:

- *how they were supervised as a student (87.9%) and*
- *refining your supervision practices based on reflections of your experiences (84.4%).*

The items marked by the lowest proportion were:

- *reading about effective supervision practices (32.4%) and*
- *participation in professional development sessions (40.9%).*

There were some disciplinary differences here. The factor *how they were supervised as a student* was highest in Architecture (95.8%), and lowest in Engineering (81.8%). *Reading about effective supervision practices* was lowest in Agriculture (29.2%) but highest in Engineering (37.7%).

Not surprisingly, the extent of supervisor experience impacted on responses. The item with the biggest difference between New and Very Experienced Supervisors was *experiences over time of being a supervisor* (64.8% to 92.1%). New supervisors were slightly more influenced than Very Experienced supervisors by *how they were supervised* (88.8% to 85.6%). Very Experienced supervisors were slightly less



influenced by *participation in development sessions* than New supervisors (40.6% to 45.1%).

Participants were also invited to add open-ended responses to the question. The table below shows the issues that were most frequently raised in these open-ended responses.

(As indicated earlier, analysis of open-ended questions is ongoing. Numbers in the table are based on analysis of the first 100 responses only. Some participants identified more than one issue in their responses.)

Major influences on Supervisor Development

Issue	Frequency
Own experiences of being supervised	26
Working with colleagues / peers	21
Experiences as / while being a supervisor	18
Learning from supervision courses / workshops (good and bad)	16
Other themes	7
working with diverse students	6
Involved in presenting supervision training courses	6
Importance of relationships with students	4
Experiences in examining theses	4
Professional experiences outside university	3
Researching supervision practices	3

Samples of individual comments provide some insight into the nature of identified issues:

- own experiences of being supervised;
- trying to be different from own bad hands-off supervision;
- own experience of supervision was poor → try to be different;
- my supervision was desultory. PG supervision these days is better;
- working with colleagues and peers;
- I prefer to discuss practice with experienced colleagues (rather than attending courses);
- refined practices based on discussion with colleagues and students;
- I attempt to share co-supervision with new staff so they get a bit of practice;
- experience as/while being a supervisor



- being mentored in effective supervision;
- talking to and reading about how top class scientists supervise; and
- experience: teaching students to think independently and innovatively.

Overall responses to the question about influences on development as a supervisor were not particularly surprising. However, the open-ended responses provide some further insights here. It is widely acknowledged, for example, that supervisors' own experiences of being supervised as a doctoral student have a major impact on their own views and practices in supervision. The open-ended responses indicate that this impact is primarily negative. Most supervisors appear to try not to replicate their own bad experiences. Supervisors' comments on the impact of working with peers would appear to have implications for how faculties and Graduate Schools might think about supervision training. Systematic mentoring programs, for example, may provide a valuable adjunct to formal courses for new supervisors.

The second question in Section 3 (**Q9**) of the survey asked participants what, if any, formal research supervision training sessions they had undertaken. Participants were required to indicate whether they had attended any of seven listed courses, and to indicate whether the courses were compulsory and whether they had found them useful. They were also invited to add open-ended responses.

The course that appeared to be taken most often was *managing candidature* (54.6% of the survey population), with those in the Creative Arts most likely to attend this course (75.8%) and those in Agriculture least likely (40.9%). The course that appeared to be least attended was *examining theses* (16.6%), with those in Education the most likely to attend (24.5%), and those in Natural and Physical Sciences the least likely (9.9%).

Level of supervisor experience impacted on course attendance and perceptions of usefulness of specific courses. Not surprisingly, Very Experienced Supervisors were generally less likely to attend formal sessions, except for those on *international students*, where they were the most likely. New Supervisors found courses on *codes of practice*, *ethics* and *managing candidature* more useful than more experienced supervisors (e.g. *ethics*: 3.76 for new supervisors, 3.40 for Very Experienced supervisors).

Supervisors in the Go8 were the least likely to attend courses in Australian universities particularly in *codes of practice*, *ethics* (Go8 36.5%, overall 43.1%), *managing candidature* (42.7% to 53.5%) and *examining theses* (11.1% to 16.6%). Not surprisingly, more courses overall were compulsory for less experienced supervisors; e.g. *codes of practice*: compulsory for New Supervisors 42.9%; compulsory for Very Experienced 29.7%.

Overall, the most useful course appeared to be *examining theses* (3.70) despite being the least attended. The least useful course appeared to be *codes of practice* (3.36). Supervisors in the Creative Arts seemed to find courses more useful than those in other disciplines (e.g. *managing candidature*, Creative Arts: 3.81, against discipline average of 3.54). However, only three courses overall showed significant differences across disciplines in perceptions of usefulness, *ethics*, *managing candidature* and *academic writing*. In terms of the latter, Natural and Physical Sciences found it least useful (3.40 against overall 3.69).



A surprisingly large number of participants chose to add comments in the open-ended component of this question. Their responses (based on analysis to date) indicate that most supervisors have completed some kind of formal supervision training session. These courses include:

- substantial courses (Grad Dips; courses of more than 11/2 days) 21;
- short courses on how to be a supervisor 25; and
- single courses on a range of topics 18.

An additional 19 participants commented on the value (or lack of value) of courses on different aspects of supervision, without mentioning any specific course.

These responses suggest that a large proportion of supervisors have attended some kind of course on supervision. However, the range of responses regarding the value of these courses highlight the challenge faced by those who have responsibility for designing and delivering such courses. It is very difficult to develop courses that meet the needs of supervisors who have diverse disciplinary expertise, approaches to research, and experience as supervisors (an issue that was identified by our symposium participants).

The third question in Section 3 (**Q10**) asked participants whether their faculty/university provides adequate support for supervisors. Participants were asked to indicate level of support (from *not at all* to *very well*) in response to eight items.

Means for all items in this question were lower than for many other questions in the survey, ranging from 3.41 (highest) to 2.24 (lowest). Means for items in this question suggest an overall low level of satisfaction in regard to support for supervisors provided by universities.

Highest means were for:

- *resources (Information and Communication Technology (ICT), library etc)* (3.41); and
- *student support e.g. academic writing, thesis development etc* (2.71).

Lowest means were for:

- *dealing with problematic students* (2.24);
- *opportunities to be mentored by other supervisors* (2.30); and
- *supervision is recognised adequately in your workload* (2.50).

Disciplinary differences were evident in relation to only three items. These were: *supervision workload*, *funding for conferences*, and *resources*. For example, Natural and Physical Sciences were least satisfied with *supervision being adequately recognised in workload* (2.30), and Agriculture supervisors were the most satisfied (2.75).

New Supervisors were least satisfied with *support for problematic students* (2.06). Indeed this was one of the lowest scores for the entire survey. Also New Supervisors felt less supported than their more experienced colleagues for *supervision in the workload*, *funding support for their students to attend conference*, and *resources*.



University groups showed statistical differences in relation to a number of items: *workload, academic writing, professional development and resources*. Supervisors at ATN universities overall were the most satisfied e.g. *Supervision is recognised adequately in your workload* (2.75 compared with 2.50 overall). Supervisors in New Zealand were more satisfied in *funding for conferences* (2.68) than their ATN counterparts (2.58). However, levels of satisfaction were low overall.

The final question in Section 3 (**Q11**) asked participants about their own ongoing development as a supervisor. Participants were asked to rank seven items from essential to not important for their on-going development. They were also invited to make open-ended comment here.

The highest scoring items for supervisors across disciplines were:

- a *greater self-awareness of their conceptions of research and supervision* (3.63); and
- *extended repertoire of supervisory practices* (3.47).

The lowest scoring items were:

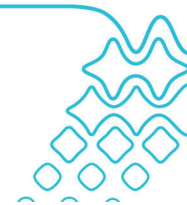
- a *greater understanding of literature on the scholarship of supervision* (2.76); and
- *enhanced understanding of Information Technology (IT) mediated communications for supervision and supervisory practices* (2.79).

Disciplinary differences impacted on responses to this question. Although there were no disciplinary differences for the highest scoring item (*greater self-awareness of conceptions of research and supervision*), there were differences in the lowest scoring item (*enhanced understanding of literature on supervision*). Supervisors in Natural and Physical Sciences scored 2.35 for this item in comparison to Education (3.44). It was noteworthy that supervisors in Education generally scored highest in items where there were significant differences: *supervisory strategies* (Education 3.84, in comparison to 3.47 overall); *policy and procedural requirements* (3.59/3.18); *understanding of IT mediated strategies* (3.18/2.79); *scholarly literature on supervision* (3.22/2.76). The only factor where Education did not score the highest was *enhanced competency in interactional and communications skills*. Supervisors in six other disciplines scored this item higher than those in Education. This may indicate that those in Education feel they are already competent in communication skills.

Supervisor experience also impacted on responses in this question. All items in the question showed statistical differences when analysed in relation to supervisor experience. Not surprisingly, New Supervisors thought all items more important than those with more experience. The factor with the greatest difference was *understanding the scholarly literature on supervisory practice* (New Supervisors: 3.02; Very Experienced Supervisors: 2.42).

University groups impacted moderately on all responses to the question. Most noticeably, New Zealand universities scored lower on all but one of the items than other categories of universities (e.g. *greater self awareness of own conceptions of research and supervisory practice*: NZ: 3.49; average for all categories of universities: 3.63). Go8 universities also scored slightly lower than average on all but one of the items, while ATN, IRU and Other Australian Universities were slightly higher in most items than the average.

In sum, it appears that in regard to their ongoing development as supervisors, participants are more concerned with reflective analysis of their own practices than with



accessing outside information – either from scholarly literature or from learning more about IT.

Views of research

Section 4 of the survey asked participants their views about the nature of research and likely future directions of research and of doctoral education. The purpose of this Section was to help locate demands and pressures of research supervision within the broader context of research priorities in universities. There were four questions in this section, as well as a final open question inviting participants to comment on any aspect of supervision or supervisor development not already addressed in the survey. The first three of these questions drew on the work of Åkerlind (2008).

The first question (**Q12**) asked participants to rank each of eight items in terms of their importance (very important to very unimportant) to the participant's research.

Overall, items in this question were rated highly by all participants. The items identified as most important were:

- *investigating questions of personal interest to me* (4.56);
- *creating a sense of achievement* (4.49);
- *investigating an issue that has been puzzling me* (4.38); and
- *making a contribution to a larger disciplinary or social group* (4.33).

The least important items were:

- *ensuring my continued employment* (3.61); and
- *discovering something new in my disciplinary area that enables me to become known in my field* (3.88).

A number of items showed variation by discipline. For example, supervisors in Creative Arts rated *investigating questions of personal interest to me* (4.72) of more importance than those in any other discipline (although differences here were relatively small). Supervisors in Natural and Physical Science rated *contributing to social, political or community change* (3.47) as less important than those in the other disciplines.

Supervisor experience also had some impact on perceptions of importance. Not surprisingly, New Supervisors rated the item *fulfilling expectations of my job* (4.20) as somewhat more important than Very Experienced Supervisors (3.92). University group, however, had little impact, except that supervisors in New Zealand rated *contributing to social change* (3.81) lower than those in Australian universities (4.01–4.19).

The survey outcomes to this question suggest that researchers in all disciplines are driven by the desire to investigate questions of interest to them, rather than more pragmatic issues such as continued employment. There appear to be differences across disciplines in the level of importance supervisors attach to social and political relevance of their research. Here there appears to be a divide along the Sciences vs. Humanities continuum. Not surprisingly, some differences occur as a result of supervisors' levels of experience, with New Supervisors being somewhat more concerned with continued employment and fulfilling expectations of their job than their more experienced colleagues.



The second question in Section 4 (**Q13**) asked participants what they saw as the major purposes of research. Participants were asked to rate each of six items (from very important to very unimportant) in response to the statement 'I see research primarily as a process of ...'.

Items in this question were also generally rated highly. The items identified overall as most important were:

- *investigating interesting questions* (4.58); and
- *addressing broad disciplinary issues of importance to my field or to society* (4.31).

Least important items were:

- *gathering of information or collection of data* (3.53); and
- *discovering truth* (3.61).

There were substantial disciplinary differences across the majority of items. All supervisors rated the item *investigating interesting questions* as important with Creative Arts (4.63) rating highest here, and Engineering (4.26) lowest. All supervisors also rated *addressing broad disciplinary issues of importance to my field or to society* as important, (4.51–4.07, except Engineering: 3.99).

However, substantial disciplinary differences were evident in the item *identifying a problem using a set of specific research procedures or skills*, with supervisors in Health (4.37), Agriculture (4.34) and Engineering (4.27) giving this item considerably higher priority than Creative Arts (3.49) and Education (3.92). The item *discovering truth* resulted in even greater variation with Agriculture (4.23) rating this item considerably higher than those in Education (3.03). Indeed, this response by Education supervisors produced one of the lowest scores in the whole question.

Level of experience of supervisors had little impact on responses to this question. New Supervisors ranked *gathering of information or collection of data* (3.62) as slightly more important than Very Experienced Supervisors (3.49), and they also ranked *investigating interesting questions* (4.43) as slightly less important than Very Experienced Supervisors (4.57). Otherwise there were few differences in responses between less and more experienced supervisors.

University groups also appeared to have little impact on responses to this question. In light of the above discussion, not surprisingly supervisors from all university groups scored *investigating interesting questions* higher than other items. There was some difference in the item *addressing broad disciplinary issues of importance to my field or society*, with the IRU group scoring highest on this item (4.33), and New Zealand universities scoring lowest (4.08). New Zealand universities overall scored items slightly lower than those in Australian universities.

Responses to this question overall confirm the value supervisors attach to investigating interesting questions and solving problems. Their perceptions of the primary purposes of research vary, however, in relation to discipline, again, primarily along the continuum between science/ technical disciplines and humanities/ social sciences. Level of experience and category of university appeared to have relatively little impact on perceptions of purposes of research.

The third question in Section 4 (Q14) asked supervisors about their purposes when publishing or reporting on their research. They were required to rate eight items from



very important to very unimportant. Responses indicate supervisors have a number of reasons for publishing and reporting research, and generally they rated items highly.

The most important of these were:

- *sharing my research with others engaged in my field* (4.63);
- *making my research known to others* (4.41); and
- *improving my research* (4.22).

Lowest rated items were:

- *encourage change amongst relevant social groups or communities* (3.75); and
- *sustain/advance my career* (3.86).

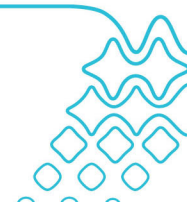
Disciplinary differences once again proved to be more important for variation in rating of items than either supervisor experience or category of university. All supervisors in all disciplines rated *sharing my research with others engaged in my field* as important, and thus ratings were very similar across disciplines (Architecture: 4.74, Management and commerce: 4.45). Ratings were also similarly high across disciplines for *improve my research* (Architecture: 4.43, Society and Culture: 4.16) and *make my research known to others* (Engineering: 4.59, Management: 4.18). (Indeed, Engineering's rating of 4.59 was the highest overall for any item in this question.)

However, ratings for a number of other items showed considerable variation across disciplines. Three such items were: *encourage change amongst relevant social groups or communities* (Education 4.21, Natural and Physical Sciences: 3.16); *extend my understanding of theoretical and conceptual issues* (Creative Arts: 4.40, Agriculture: 3.87); and *sustain/advance my career* (Agriculture: 4.19, Education: 3.48). The variation in relation to discipline once again seems to reflect the science/technical disciplines–humanities/social sciences continuum.

Level of supervisor experience generally had little impact on reasons for publishing or reporting on research. For example, all supervisors sought to *share research with others engaged in my field* (New: 4.61, Very Experienced: 4.64); all supervisors sought to *make an impact on their field* (New supervisors: 4.13, Very Experienced: 4.22). Two items showed some variation. These were: *improve my research* and *sustain/advance my career*. Not surprisingly, these items were more important for New Supervisors than Very Experienced (4.30/4.07 and 4.05/3.86 respectively).

University groups had little impact with only two items showing any variation here. These were: *making an impact on my field* and *encouraging change amongst relevant social groups or communities*, with the Go8 scoring the highest in the first (4.30) and the Other Australian Universities in the second (3.97). Supervisors in New Zealand, again, scored the lowest in both these factors (4.04/3.47).

The fourth question in Section 4 (**Q15**) was open ended and invited participants to comment on what they saw as important future challenges and changes in research education. As indicated previously, analysis of open-ended questions is ongoing, and here we report only on analysis of the first 100 responses. The table below shows the themes with the highest frequency of comments.



Supervisors' views on further Challenges and Changes in Research Education

Theme	Frequency
Decrease of investment in, and (under) valuing of research	23
Increasing challenges and pressure on academics	22
Impact and challenge of diverse students	17
Specific challenges for future research	14
Pressure for PhD completions + pressure on students	14
Preparation of students prior to enrolment in research degree	14
Pressure on supervisors	12
Changing nature of PhD	12
Need of more support for students	5

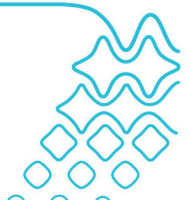
A sample of comments providing insights into the nature of these themes is as follows:

- decrease of investment in, and (under)valuing of research;
- decrease of investment in research is adverse to creating knowledge and advancing thought;
- rise of bureaucracy and compliance costs; rampant managerialism in universities;
- challenge of funding for research including research education to create sustainable career possibilities;
- pressure and challenges on academics;
- pressure for accountability and increasing responsibilities in academic work;
- pressure from adoption of corporate model in university education;
- increased institutional expectations on academics;
- balancing demands of performance based research funding with demands of teaching and community service in environment of increasing constraints;
- challenges and changes in research education: impact and challenge of diverse students;
- lack of interest in research by students: convincing good students to undertake research; attracting good students to universities other than Go8;
- distance and part-time students (so not part of research culture);
- increasingly diverse students - age, ethnicity, purposes for undertaking research (challenge of dealing with this diversity);
- preparation of students prior to enrolment in research degree;



- problem of dumbing-down of undergrad degrees (and under-prepared students);
- weakening of disciplinary pathways —> less well prepared students;
- need to engage undergrads in research in preparation for research degrees;
- dealing with students with poor initial skills — writing, reading, critical analysis;
- specific challenges in future research;
- addressing new issues in research in relation to global climate change, energy, greenhouse etc;
- contesting hard/soft science schism: avoiding caricature of social science;
- dealing with ethical considerations, especially arising from newer technologies;
- maintaining support for curiosity driven research and all its associated risk;
- creating culture of research which is collaborative and focused around broadly shared agenda, rather than individual whim; and
- need for multidisciplinary and team approaches (some universities are poorly prepared for this).

This range of themes identified by participants in their responses to this question is noteworthy in itself. These themes correspond to a number of similar issues identified by symposium participants. In survey responses participants' addressed the specific and often competing pressures faced by academics and students who are engaged in research education. A comparison between symposium outcomes, where the perspective was on the bigger picture of research education, and participants' responses to this survey question provide different perspectives and insight into the complex and pressured world of academia.



Report from interviews with research leaders and supervisors

This is the third of three sections where outcomes from analysis of data are reported. The purpose of this section is to present outcomes from analysis of interviews. A version of this section has previously been published on the FIRST website (www.first.edu.au).

As indicated earlier, the interviews were designed to follow up issues that emerged from the survey. Thus, themes evident in the interviews reflect and overlap with many of those that emerged from analysis of the survey. The value of outcomes from the interviews lies in the more nuanced insights they provide into these themes than were available from the survey

As indicated, the interviews were of two kinds: those that sought the views of leaders of research education within universities and faculties; and focus group discussions with groups of supervisors. Predictably, these two groups overlapped to some extent. For example, research education leaders were also typically active supervisors, while some of the supervisors who attended focus group discussions were also coordinators of research programs within their faculties. Nevertheless, interviews with the two groups did provide some differences in perspectives.

As also indicated, six universities were approached to participate in the follow up interviews. These included two Go8 research-intensive universities; two ATN universities and two regional universities. Universities were selected on the grounds that they were representative of different categories of universities, and that they were from different Australian states. The initial approach to these universities was via the DDoGS. The project team then followed up with a series of emails to the DDoGS representative at each selected university; to research degree coordinators (identified by DDoGS representative) and to focus group participants (identified by research degree coordinator). Interview times at each university were then negotiated.

In total, interviews were conducted with 59 participants. Of these, eight interviews were with research leaders (these included: PVC Research; DDoGS); 14 with research degree coordinators (these were coordinators of research degree programs); and 37 with supervisors in focus group discussions.

Interview questions were developed around a specific number of topics. For research leaders and research degree coordinators these were:

- the changing nature and purposes of research degree education: interviewees' perceptions of the extent to which research degree education is changing;
- changing purposes of research degree education;
- likely future directions in research degree education;
- likely implications of any changes for research degree supervision; and
- likely implications of changes for research degree education training.

For focus group interviews with supervisors, these were:

- purposes and priorities of research degree supervision;
- challenges of being a supervisor;



- influences on own ongoing development as a supervisor; and
- priorities in research supervision training and supervisor support.

(See Appendices 3 and 4 for details of interview questions.)

All interviews were audio recorded. Analyses of interviews began with a detailed summary of what was said in each interview. These summaries were double-checked by members of the project team. They then provided the basis for content analyses that aimed to identify the major recurring themes and issues in interviewees' comments. On the basis of these content analyses, a framework was developed to summarise major themes and to identify major features within those themes.

Outcomes from analysis of interviews

Four major themes were evident in the analysis of interviews. These were:

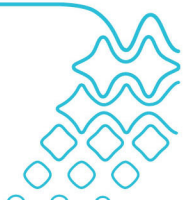
- *Formalisation of research education*: the expansion and increased accountability in research education; the impact of introduction of explicit standards and accompanying quality assurance systems;
- *Diversity in research education*: the expansion of research education, a diverse set of students, processes, outputs and outcomes;
- *Nature of contemporary supervision*: the effects of the formalisation and diversity of research education upon supervision; requirements for a wide set of skills and knowledge beyond supervisors' disciplinary expertise; and
- *Support for supervisors*: needs of supervisors; development of supervisors' skills; provision of support services and resources.

Formalisation and professionalisation of research education

The first major theme/issue to emerge from interviews was the increasing formalisation and professionalisation of research education that has taken place in recent years. Although not asked directly about this issue in interview questions, it was identified as a major factor in research education by all interviewees: research leaders; research degree coordinators; and supervisors. Interviewees noted that with the growth in research education, and increasing intervention from government and other peak bodies, there was pressure for a more systematic approach to research education and for greater accountability to various stakeholders. The consequence, especially in large institutions has been increasing formalisation and professionalisation of research education. The process of formalisation is interwoven with the introduction of specific structures within universities, but is also interwoven with increasing professionalisation of research education as a whole. The complex nature of this shift was evident in the ways in which it was discussed by interviewees.

Interviewees identified two major components in the process of formalisation and professionalisation. These were:

- the introduction of Quality Assurance (QA) processes that aim to ensure consistency of standards, and compliance with regulations and
- the development of a more professional approach of research degree education, with a push to make supervision more visible, transparent and open.



The impact of Quality Assurance

Quality Assurance, standards and compliance were identified as major issues by all research leaders, research degree coordinators and by supervisors. Overall discussion of QA by interviewees highlighted the relationship between formalisation and the introduction of specific structures and mechanisms in research education programs. Examples of such structures and mechanisms raised by interviewees included student progress reports, student surveys and supervisor registers. Other examples included imposing limits on the number of students per supervisor; mandating the frequency of meetings with supervisors; and documenting what students might expect from their supervisors. Perhaps not surprisingly, research leaders, research degree coordinators and supervisors had a somewhat different 'take' on the value and usefulness of these mechanisms.

The research leaders and research degree coordinators who were interviewed in the project were people who had responsibility for research education and who were involved in implementation of QA. Most regarded QA mechanisms fairly positively. They generally agreed there was a need for structure in research education and saw QA processes as ensuring all supervision within their university or faculty was at an acceptable standard. One research degree coordinator described this as needing to protect the brand of her institution when it came to doctoral education. She said,

There has been a massive change in the doctorate, from being a personal relationship to one that is with the institution. Previously the relationship between the supervisor and the institution was one of trust, which worked when the numbers were relatively small.... now it is not about the personal relationship between supervisors and their students but about the product name. Now you have to protect the product name, you have to have quality control mechanisms (Research degree coordinator, Go8 university)

Others mentioned the need to prevent malpractice by supervisors, which in extreme cases could result in litigation. Some however, expressed reservations about overemphasis on QA and with the resulting possibility of narrowing supervision. For example, one research degree coordinator said,

I worry about 'one eye' views of what supervision is. I also like to expose them to other supervisors from other faculties and to different ways of doing things. (Research degree coordinator, regional university).

Research leaders argued that pressure for QA in universities has resulted in the development of more centralised policies, structures and procedures in relation to doctoral education. One research leader stated,

there is a real role for central focus and a real benefit in having a graduate office with central responsibility for QA and monitoring enrolments through to management of thesis submission and examination process etc (Research leader, Go8).

This view was reflected by another research leader who stated,

you can develop policies at central level to say that faculties must do xxx and generally faculties will comply, but it is preferable to have the backing from DVCs[Deputy Vice-Chancellor] and some notion of sanctions... These moves have been partially responsible for the setting up of graduate schools (Research leader, ATN university).



More centralised control of research education has also resulted in greater compliance with ethical standards in research education. One research leader commented,

I discuss ethics often, most believe that ethics are necessary and if planned for are not a great problem, e.g. Ethics and IP requirement are fundamental and indeed facilitate effort with the university. A little effort at the beginning is worth the effort in comparison with the problems that might occur later. ... We are developing a 'light' version of the ethics process where there is a very low likelihood of harm to participants (Research leader, ATN university).

Research leaders and research degree coordinators pointed out that moves towards increased QA and centralised management were often entwined with pressure from stakeholders such as governments and sponsors for more timely completions. Some interviewees identified the pressure for timely completions as the most profound recent change they have seen. As one research degree coordinator commented,

One of the greatest changes I have seen since I completed my degree is the pressure on timely completions, the days of 8 years to complete are gone (Research degree coordinator, regional university).

This pressure was a cause for concern for some interviewees, although as a number noted, most universities are reasonable about completions. One research degree coordinator said,

The pressure for completions means that 3 years for a PhD is a bit tight, the PhD is a bit undercooked. I believe 4 years is about right for a PhD, you have got to have some flexibility. However, it is healthy to have a bit of pressure (Research degree coordinator, Go8 university).

Another from the same university commented,

Timely completions are always an issue, but the university is flexible here but we do not view that it takes as long as it takes. There is some pressure to complete, but it is not excessive. It does not mean students have forever, as we do want them to complete (Research degree coordinator, Go8 university).

Focus group interviews revealed that supervisors saw the formalisation of research education somewhat differently from those whose role was to oversee it. For many, it was difficult to see the benefits of structures that had been imposed by their universities, and in particular to see the benefits of some of the QA processes. As one supervisor put it,

Academics balk at being asked to jump through hoops. The ultimate benefit, of course, seems to be for university to confirm it is compliant' (Supervisor, regional university). For a number of supervisors, the QA processes were seen simply as surveillance. As one supervisor said, 'I think we need less surveillance, it seems counter-productive. You have to acknowledge supervisors as experts (Supervisor, regional university).

Another took the view that,

the whole university system is becoming more bureaucratic; we now have to register as a supervisor. I think it is not necessary. There are professors who have had many years of supervision and had many completions. It is just not needed. Faculty level registers are more useful (Supervisors, ATN university).



Some supervisors, however, could see the need for QA processes and indeed felt there were some tangible benefits of such systems. One supervisor said,

Some of the formalisation I am grateful for, such as the confirmation process, which although at the time is a lot of work, and you never write the thesis that you say you will, it does save a lot of time at the end (Supervisor, ATN university)

Another supervisor had similar views on this issue. She said,

Things when they are put right up the front, like Intellectual Property Rights, can help later on. I think annual reports are important; they make you consider the timelines for the research. I think they are good markers and you feel more comfortable about giving tough feedback (Supervisor, ATN university).

To some extent differences in supervisors views tended to reflect discipline differences, with those in humanities, perhaps surprisingly, more inclined to see the value of QA procedures than those in sciences.

Supervisors had mixed responses to specific QA mechanisms. Some could see the benefits, for example of a supervisor register. As one said,

I think mandatory registration is important. I was thrust into supervision with no mentoring; I wish it had been there when I was a new supervisor (Supervisor, ATN university).

Others felt that it had no useful role to play and was just a way of controlling them,

With the introduction of the supervisory register, there is a requirement to attend a training course, many experienced colleagues are not happy about this. They say, 'we have been getting many PhD students through for years and we don't need to do any training (Supervisor, ATN university).

Some supervisors were concerned that QA mechanisms removed the heterogeneity of supervisory practices, and many commented on the 'single model' they saw being promulgated by their institutions. For example, one supervisor said,

There is a 'one model fits all' approach here; it assumes a unitary way of doing research' (Supervisor regional university).

Another reflecting on her attendance at the focus group for this study said,

I have gained more things to think about post grad supervision talking here and pooling what we have in common, whereas anyone who is running a seminar has to be in some way promoting a model or pushing a line of advice (Supervisor, Go8 university).

Professional approach to research education

The second component in formalisation and professionalisation of research education evident in interviews was the overall shift to a more professional approach to research education within universities, faculties and amongst supervisors. Discussion of this shift was generally framed in association with a shift toward making supervision more visible, transparent and open.



This notion of professionalisation of research education is reflected in a comment from a research degree coordinator who said,

we aim to improve the resources that universities are putting into degrees; and the efficiency of students; and hopefully what students have learned about their subject, and their research skills (Research degree coordinator, ATN university).

Overall there was a greater level of agreement amongst all interviewees regarding the value of professional approaches and of making supervision more transparent and visible than was the case with quality assurance and compliance.

Research leaders and research degree coordinators were very positive about the value of placing supervision pedagogy more centrally in institutional thinking, and of making it more open. A number of interviewees commented on the value simply of having discussions about supervision. As one research degree coordinator put it,

we need to have dialogues about good supervision. When we have problems in institutions this is the only sensible way of addressing them (Research degree coordinator, Go8 university).

A similar view was expressed by a research leader,

discussion about supervision are beginning in ways have never happened before. People are becoming aware that things happen differently in different parts of the university, sometimes for very good reasons. Previously supervision was a private matter and covered all sorts of sins. Now it is becoming more open to public scrutiny (Research leader, Go8 university).

Discussion around the value of making supervision more transparent and visible included debate about whether research education (and supervision) was primarily pedagogy or research. Many research leaders and coordinators argued that supervision is primarily a pedagogical issue. As one research leader said,

I see it (supervision) as a pedagogical relationship; although the students are producing a research product. Supervisors should see it this way but it varies by discipline (Research leader, regional university).

A research degree coordinator commented,

We need more emphasis on the pedagogical relationship and more recognition of the PhD as a professional qualification and as a preparation for academic and professions. The professional role of supervisors should be seen as much as being concerned with teaching and learning as research (Research degree coordinator, Go8 university).

Another research degree coordinator at the same university said,

One of the problems in the sector here and internationally is that there is so much emphasis on research that there has been insufficient emphasis on teaching and learning. We need to position PhD programs in a more holistic way (Research degree coordinator, Go8 university).



One institution had recently moved doctoral education from the research portfolio to the teaching and learning portfolio, and a research leader from that university commented,

we needed a community or network where people are sharing and are informed by pedagogical thinking; this is the idea and I think research supervision needs to fit within that. This is why I am so pleased that supervision has been placed in education portfolio (Research leader, Go8 university).

However, this view was not shared by all. One research degree coordinator said,

I see it as both, but it is better to align supervision with research rather than teaching, I think the one thing that makes doctoral education different to other teaching is the need for research. It therefore aligns more to research activities but it does have a pedagogical element (Research degree coordinator, Go8 university).

Focus group interviews indicated that supervisors also responded positively to making supervision more visible. They commented on the value and usefulness of having opportunities to work collaboratively with their peers and of having opportunities to talk about supervision. They valued, in particular, opportunities to talk to others if they faced challenges with a particular student, and they learned from strategies that others used in their supervisory practices. As one interviewee said,

another supervisor came to talk to me about a student who was not progressing well. I just had a normal conversation and he said that was really helpful; but I think it was because we broke it into pieces; so creating an environment where people feel free to come and ask advise about things (Supervisor, Go8 university).

Supervisors also commented on the importance of experience in supervision. For example,

The vast amount of learning to be a supervisor is learning on the job; you also learn from talking to colleagues; I have been to a few seminars, but mostly you learn by talking to others and then by doing and working out how to do it a bit better, so when to get in there (when supervising a students) and push further and when to let it go (Supervisor, ATN university).

Supervisors frequently described research education with passion and commitment, and expressed concern that the core value of research education as engaging with knowledge be maintained. For example,

The value [of research education] lies in developing knowledge and understanding of a topic, in growth of knowledge; and of personal growth. We need to keep this in picture along with emphasis on institutional requirements.

It's not just instrumental value but it's the broader and more intangible benefits from doctoral education and engagement with the process [of knowledge and research]. Identity [of students] can change as result of being involved in the doctoral process; individual benefit cannot be measured and it's not to do with productivity and getting jobs.

The research process involves learning (not just about end product) but about interactions you have with people and the excitement and joy of discovering things and of engaging deeply with issues; it's the joy of



*early reading and engaging with new theories and discoveries.
(Supervisor discussion, ATN university)*

However, the consensus was that there was value in a professional approach to research education. As one supervisor explained,

There is pressure to be more accountable, and I am interested in holding onto the good things of the traditional thesis; but we have got better at doing things; we now have new structures that help students to streamline the process; so we have got better at helping students' (Supervisor, ATN university).

Diversity in research education

A second major theme evident in interviews in the project was that of diversity in research education. This theme emerged as major priority in interviews with research leaders, research degree coordinators and supervisors. Discussions of diversity included:

- diversity amongst students themselves in terms of:
 - cultural and linguistic backgrounds; and
 - reasons for undertaking research degrees;
- diversity in processes of study, in the impact of globalisation and technology, and in ways of engaging with data;
- diversity in outcomes from research degrees:
 - diversity in what counts as a thesis;
 - diversity in range of outcomes; and
 - diversity in career pathways following completion of research degrees.

All interviewees agreed that increased diversity constituted a major change in research education.

Diversity amongst students themselves

Diversity amongst students was identified as a major issue by all groups of interviewees. In line with comments made earlier during the project symposium, interviewees commented on the impact of globalisation on research education and saw globalisation as a major contributing factor in the increasingly diverse nature of students enrolled in research degrees. Interviewees described this diversity in terms of the cultural and linguistic background of students, but also in terms of students' reasons for undertaking research degrees, and in the career pathways they see for themselves following graduation. While, overall, interviewees were positive about diversity, there was some variation between research leaders, coordinators and supervisors regarding the challenges that this diversity posed. Not surprisingly, research leaders and coordinators tended to focus on the overall balance of students in research degree programs and on challenges to program management posed by diversity. However, supervisors were more concerned with the day-to-day challenges in working with students that diversity imposed, and here academic English was identified as a big issue.



The issue most frequently raised in relation to diversity of students was that of international students. Research leaders and coordinators spoke of the pressure to enrol increasing numbers of doctoral students and in particular to enrol international students. One research leader commented that for her institution,

The main recent change (in the last 5 years) has been the diversification of the student body due to the increased number of international students (Research leader, Go8 university).

Some interviewees expressed concern about the understanding of what was involved in doctoral study and with the (inadequate) preparation of international applicants. As one research leader said,

We get lots of queries and applications from international students but they are often not up to PhD standard. We therefore reject them and so the next question is what do we need to do to get them up to standard? At the moment we don't have facilities to support students to make the transition but we are under pressure to take students because of the money they bring (Research leader, ATN university).

Some research leaders and coordinators noted that whereas in the past they had been under pressure simply to enrol students (and especially international students) into research degree programs, now they are more selective. They also noted that, with the overall formalisation of research degree programs, entry criteria had tightened considerably and are more consistent. Some also noted that recent government pressure to expand research programs is likely to present problems. The concern is that, with increasing global competition for good doctoral students, even with international students, the pool of potential research degree students is too small. As one research leader said,

we are concerned with (over tightening) the strategy around recruitment of PhD students, and we will need more students to recruit with the expansion of funding for PhDs. With additional funding (from the government) for more students, it's now not difficult to get scholarships. So the question is where to place the bar for entry to PhDs. Or whether there is some market that is untapped of top quality students who not coming to Australia ... I don't believe there are a lot of people out there (Research leader, Go8 university).

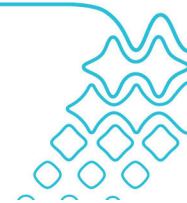
Supervisors also commented on international students in relation to diversity. However, as one supervisor pointed out, diversity in research education programs as a result of international students is not new,

We have had international students for a long time, the only difference appears to be the level of English language they have; it is not as high as it once was (Supervisor, ATN university).

A number of supervisors expressed concerns about 'inadequate preparation' of research students. By this they appeared to mean that students brought with them very different notions of education systems, and that frequently they had an inadequate understanding of what was involved in research degree study in Australia.

The issue most frequently raised by supervisors in relation to international students was that of academic English, although as some pointed out, academic English is an issue not only for international students. One supervisor commented,

I have a fairly balanced group of students in terms of international and domestic enrolments. They have a high degree of difference in their



English language capabilities; some are excellent whilst others are very problematic. The demands are hugely different. One I have to check word by word to even get the meaning (Supervisor, regional university).

The majority of supervisors were sympathetic to the demands that their students faced in reading and writing in their second language, but felt frustrated at times because they did not have the resources (or knowledge) to be able to assist their students adequately. Many also felt that supporting students' academic English was not their job, and they felt that universities needed to provide higher levels of resources here. One supervisor said,

I have not responded as well I have could have to the change in the student body. I say to students I am here to teach you science and not English, so I expect them to present work which is readable. I think I cannot carry on with this as I feel I need to teach them how to write (Supervisor, Go8 university).

Another supervisor said,

the challenge is to establish balance of what is my work and what is student's (in regard to academic English) and the amount of support I should provide; and how hard I should push the students (Supervisor, regional university).

For interviewees, it is not only writing skills that present challenges, reading skills are also problematic. One supervisor said,

I am finding more effort is required to the early stages of the PhD to foster reading skills (Supervisor, ATN university).

Supervisors noted a number of other ways in which both local and international students are diverse: in age; in background; in personality; and in the pressures that the students need to juggle while studying. As supervisors pointed out, students come from wide sets of backgrounds. Some come straight from their honours year and are able to commit full-time to their studies, others are mid-career, have family responsibilities and can only commit some of their time to their studies. All of these factors produce challenges to supervisors and those who manage research education. For example, one supervisor reflecting on these issues said,

Diversity for me is not that sort of diversity [international students]. It is about students' personalities and their needs. I never had one type of student. To me this is the issue. The main thing is the different demands they make on me. I am finding students are having more demands on their lives, rather than making more demands upon me. I have one who is a single mum and working part-time, one is flying to Hong Kong for a divorce, and another is working as a cleaner (Supervisor, ATN university).

Other aspects of diversity amongst students identified by supervisors include the level of demands students make on supervisors; and in the skills and knowledge that they bring to their study. As one supervisor commented,

My perspective is that the older generation are more self-directed and self-motivated. You can tell them things and not do it for them. Whereas with the younger students they need more motivation, they are lot more insecure and they need a lot more feedback (Supervisor, ATN university).



Diversity of processes and modes of study

In addition to diversity amongst students, research leaders, research degree coordinators and supervisors all commented on increasing diversity in processes and modes of study within research degree programs.

The choice of full-time or part-time mode of study is not new in research education. However, as interviewees indicated, mode of study has an impact on the research culture of faculties and has a considerable impact on supervision practices. Mode of study is also related to disciplinary differences in what is regarded as 'usual practice'. For some faculties, typically in the sciences, the usual practice is full-time student enrolment, and for them, the challenge is to accommodate part-time students. For other supervisors, typically in social sciences and humanities, usual practice is where most, if not all of their students are part-time. Typically here there are processes in place to accommodate the needs of part-time students. Some supervisors across all disciplines have a mix of full-time and part-time students and they need to address challenges associated with supervision of both full-time and part-time students.

Diversity in full-time and part-time mode inevitably intersects with diversity of students themselves. Full-time students tend to be younger, have fewer family responsibilities and usually undertake less paid employment, while part-time students typically are older, work longer hours, and have significant family responsibilities. A research degree coordinator commenting upon the issues of recruiting doctoral students in her area said,

the real dilemma is that there is a shortage of doctoral students in nursing. Our students tend to be older, have a mortgage. They don't want to be full-time, they want to be part-time (Research degree coordinator, regional university).

A research degree coordinator from another university said,

The model of students being full-time and on campus does not apply here; we work with students from all over the place. You can only really do it in the social sciences because of the absence of bench work. One of the things the doctorate needs to do is become more flexible to allow more types of students to benefit from it (Research degree coordinator, ATN university).

As indicated, discipline differences impact on what is regarded as 'usual practice' regarding full or part-time mode of study. Discipline differences also impact on what is considered 'usual practice' in how students undertake their research. In some of the sciences, for example, it has been usual practice to undertake a doctorate in a team-based laboratory environment, while in the humanities or social sciences, usual practice has more often been the more solitary experience of students working with one supervisor. As interviewees pointed out however, usual practice in the humanities and social sciences is undergoing some change. There are, for example, a growing number doctoral studies being undertaken in the humanities that are part of larger research projects – typically those funded by the Australian Research Council (ARC). A supervisor, reflecting on these changes, said,

APA (I)[Australian Postgraduate Awards (Industry)] scholarships present some challenges to supervision as you have the dual aims of the project and the student (Supervisor, ATN university).



Another commented that,

he had done a number of linkage projects in the past and they leave a bad taste in your mouth. You put a lot of effort into setting them up but you get little out of it. However, the advantage of an APA (I) is that the supervisor can choose the topic (Supervisor regional university).

A further dimension of overall diversity in processes of study within research education is the physical location of students in relation to their supervisors. Interviewees pointed out, students are now able to be enrolled in an Australian university, and be supervised from that university, while living and working in another country. As one supervisor explained,

I am getting more international students who are not on campus. I have one student where I have been to his country more often than he has been here (Supervisor, Go8 university).

Another supervisor commenting on her experience with international students said,

I have one doing an Australian PhD, who lives in China: her project is about China. What Chinese people consider being normative in comparison to what Australian people consider to be normative is a minefield (Supervisor, regional university).

It is not only international students who may be located at some distance from their supervisor. One supervisor, commenting upon the location of her students, said,

The bulk of my students do not come onto campus, I meet them in my own town (Supervisor, regional university).

In addition, it may be the supervisor who is located outside the university. They may work for an affiliate of the university, another university or an outside organisation.

Diversity in range of outcomes from research education

A final dimension of diversity identified by all interviewees was that of diversity in range of outcomes from research education. Discussions of this issue included: increasing diversity in what counts as a thesis; diversity in the kinds of skills that research education is expected to develop; and increasing diversity in students' career pathways following completion of their degrees.

Research leaders, research degree coordinators and supervisors all commented on the increasing diversity of theses within their universities and faculties. They saw theses, especially in creative arts and in some of the less traditional disciplines, as pushing the boundaries of what was possible and as opening up new modes of knowledge. Interviewees were, in general, accepting and, at times, excited by the possibilities for non-traditional theses. As one research degree coordinator explained,

we have a strong sense of the notion of diversity of doctorate outcomes in creative faculties, for example, music performance plus some kind of written text. There are interesting questions around what is the written text that accompanies performance and what makes it a doctoral level work? It's very impressive how creative arts people can articulate what makes this doctoral level work (Research degree coordinator, Go8 university).

While there was general interest and acceptance of non-traditional theses within areas such as creative arts, there was reservation about developments in some other



disciplines. One research leader for example, expressed concern that some health areas wanted to introduce doctoral programs where the outcomes would involve only practice, and would require no thesis at all. He said,

the big issue is the professional doctorates, and the taught doctorates. These are highly contested at our university. Some are now all course work with no thesis ... so they are doctorates by virtue of their clinical training program. These raise difficult issues. They have the title but are not doctorates in sense of a PhD. Professional doctorate[s], where there is a thesis component, are a different issue. Legitimate doctorates need to have a thesis component of certain length (Research leader, Go8 university).

A number of research leaders and coordinators raised the issue of compulsory students' publications. While publication of students' work during their study has long been encouraged, a number of universities and faculties are considering making publication a requirement for completion of a research degree. As one research leader stated,

We are thinking about formalising that students must publish before completion. One aspect of this is to move away from the idea that the conversation during candidature is primarily with the supervisor to one that engages directly with the wider scholarly community (Research leader, Go8 university).

The push toward making publications compulsory was supported by some supervisors. As one supervisor argued,

journal papers are more of a quality control than the thesis, it harder to get a journal paper written than a thesis (Supervisor, ATN university).

Others were concerned that the push for compulsory publications raised the thorny issue of supervisor – student publications. A research leader at another university stated,

Those (supervisors) who get their students to publish are those who want to get their name on the student's paper. I don't like that very much. I don't push it, the university as a whole would like it more pushed than I do, but I think academics should produce their own publications and not sit on the back of students (Research leader, regional university).

A considerable number of interviewees commented on the additional skills that research education was now expected to deliver. While the thesis of approximately 80,000 words remains the major outcome from doctoral programs, they pointed out there is a growing range of other outcomes expected from research education. One research leader commenting on this, said,

So that is one element: broader development of students beyond just the thesis, or either thinking of the thesis as developing those broader skills, e.g. understanding of national codes, ethics, abilities to give a conference paper, to teach in higher education, to disseminate your work; to understand and articulate your work (Research leader, ATN university).



Others saw the outcomes in terms of more specific skills students developed during their studies. For example, one supervisor said,

the process of writing is one outcome; other skills are conducting focus groups, designing surveys and project management skills. The students who flounder are those who have problems with these other skills. Also having and developing interpersonal skills is important when your project engages with people (Supervisor, ATN university).

A research degree coordinator commenting upon the skills said,

One of the main outcomes is generic skills, such as reading carefully, writing carefully, thinking carefully, speaking articulately etc. It is their confidence, their way of looking at ideas (Research degree coordinator, ATN university).

One supervisor felt that completion of the thesis itself provided the means by which other skills could be developed. He said,

There are some interesting benefits from the thesis, one is to become independent, it is also about intellectual dialogue, it's about sustained dialogue with the supervisor. The combination of these is a focus on the thesis (Supervisor Go8 university).

Many interviewees also commented on the increasingly diverse career pathways that students take on completion of their degrees. The traditional career path following graduation has long been an academic career. While this is still a common career path for students, it is by no means the only one. Many doctoral graduates work in industry, in government, in consultancies, in Non Government Organisations (NGOs). A supervisor, with industry based research experience, commented,

The outcome of the (students') research will inform policies. They have to go out and disseminate the outcome of their research beyond the thesis (Supervisor, ATN university).

Another view came from a supervisor who said,

in my area (creative writing) the process overtakes the importance of the thesis. That is, writing the creative novel is more important than the thesis. It depends upon whether you view the short or long term development of the scholar as important (Supervisor, ATN university).

The changing nature of contemporary supervision

The third theme evident in interviews was that of the changing nature of supervision: what is required of supervisors, how supervision is undertaken and who can do it. Interviewees pointed out that the increased capacity and diversification of research education, coupled with the requirement of accountability (and the QA systems to achieve this) has led to increased demands on supervisors. As a result, the roles of supervisors are becoming more complex: their roles now include the need not only to be discipline experts, but also managers, mentors, coaches and facilitators.



Discussions in interviews of the changing nature of contemporary supervision included:

- pressures on supervisors/ supervisors' workloads;
- supervision practices (including who 'leads' the project); and
- relationships between students and supervisors.

Pressure on supervisors and workloads

Research leaders, research degree coordinators and supervisors all agreed that pressure on supervisors and supervisor workloads were substantial. Research leaders and coordinators, however, had slightly different perspectives on these issues than did supervisors.

University leaders and coordinators reported being aware of the pressures faced by research supervisors, although, on the whole, they felt that workload requirements for supervisors were reasonable. They recognised that compliance with the QA requirements, such as the completion of annual student reports, training, ethics, placed some pressure on supervisors, but felt that these pressures were not excessive. Nevertheless, they acknowledged the pressures faced by supervisors in juggling time available for teaching, research, publishing and supervising. As one research degree coordinator put it,

the pressure varies slightly from discipline to discipline; but it hasn't necessarily increased. The pressure on academics to be research productive has increased but this is a joy for academics; time pressures on academics have grown a bit as universities have become more complex organisations ... if academics are good at organising their time, they can deal with the pressures (Research degree coordinator, Go8 university).

Some disciplinary differences were evident in regard to perceptions of the demands of supervision. As one research degree coordinator said,

It is a well known paradox that science students contribute to supervisors' research but in humanities they take away. This has to be recognised within institutions and in workload, productivity and promotion committees. Many universities generally have taken this on board; so academics are judged by their own peers (where this paradox is recognised) (Research degree coordinator, Go8 university).

An issue of concern to many research leaders and coordinators was that of numbers of students per supervisor. Most reported that their universities had restrictions on the numbers of students that could be supervised by one supervisor at any one time. However they also acknowledged that this restriction was not always adhered to, and that some of the more experienced supervisors had supervision workloads considerably higher than recommended.



Not surprisingly, the issue of pressure on supervisors was high on the list of supervisors' concerns. While, as indicated earlier, some had grumbles about the compliance with regulations, many felt that compliance was not too arduous. Some, in fact felt that these requirements actually assisted the supervision process and reduced pressure on supervisors. In addition, few supervisors expressed concern regarding the numbers of students that they were supervising. The issue for most supervisors was completing pressures on their time and the need to balance time required for supervision with time required for teaching and for their own research and publications. As one supervisor said,

Supervision is seen as a 'tack on' even though there is work allocation. You have a full-workload and then you are given research students. You need to do the reading, the writing, the thinking (Supervisor, regional university).

Another supervisor said,

In terms of the balance in our overall workload, I believe supervision is getting the short straw (Supervisor, ATN university).

Many supervisors commented on the various strategies they used to cope with their workloads: some said they had had to become more efficient in the way they operated; some said they had dropped some activities (often their own writing); and others said they were working very long hours. As one supervisor said,

I am spending a lot of time getting students to write at the expense of my own writing. I have very little downtime and I have become fairly efficient (Supervisor, ATN university).

Supervision practices

Research leaders, coordinators and supervisors agreed that supervision practices have been changing. As indicated earlier, this is in part seen as a result of formalisation of research education and of the introduction of QA procedures. It is also seen as a result of broader processes of professionalisation in research education and resultant shifts in thinking about supervision. Many interviewees described the change in supervision practices primarily as a shift from a private space, where student and supervisor worked together with little interference or contact from others, to a more public space where supervision practices are more visible and more open for discussion, reflection and negotiation, and where they are also more accountable.

A consequence of overall changes is that the experiences of many supervisors' own doctorates no longer provide appropriate models for supervision practices today. A number of supervisors recalled their own supervision as being left alone to get on with their studies, and as being expected to be self sufficient, independent and self-motivating. While many reported favourably on this model of supervision, they commented that it would not be appropriate today. As one supervisor said,

When I was a PhD student I was pretty much left on my own. I was given the task and left to get on with it. I think this is a good way to do it, you give them the ball and they run with it and they adapt ... but it would not work with my students. The problem with my students is that they need much more supervision. The bulk of them I have to watch carefully, otherwise they will go off in their own direction (Supervisor, ATN university).



Another recalling his own experiences, said,

I think I did my doctorate differently to my own students, if I found a problem I would do most of the problem solving and then present it, whereas my students present me with the problem, I really have to push my students to be independent (Supervisor, ATN university).

Supervisors generally agreed that students now expect higher levels of support from their supervisors than in the past. Some supervisors argued there has been a change of culture where students are now treated as customers, with the result that there has been an associated a shift of the responsibility from student to supervisor for the success of the study. As one supervisor said,

There is also the dynamics of liability of what happens if the student does not complete within four years. How do you show who, if anybody, is at fault? (Supervisor, regional university).

Another reflecting on this aspect of contemporary supervision said,

There is also a risk of something 'blowing up', it can fall apart and they point the finger at the supervisor. Hence, I keep emails to ensure that if they accuse me of not meeting I have an audit trail to show what has happened (Supervisor, regional university).

Supervisors also discussed the question of who has responsibility for leading the 'project' of the research degree. Here supervisors had a range of opinions. The majority view was that, since students differ in their needs, supervisors need to be flexible in the level of direction they give to their students and the amount of time they allocate for supervision. One supervisor commented,

We are trying to stay on top of ensuring that students who fall off the radar are contacted. In other cases you need to work out whether you should leave someone alone because they work better that way. There are others who you have to stop becoming too dependent (Supervisor, Go8 university).

As other supervisors pointed out, flexibility can be very difficult. One supervisor said,

I am a good supervisor with some students and not with others, and that is due to every student being different. What I have learnt is to pick the right student. Treating everybody differently is difficult for me. You can have the best student in the world but if they don't fit your personality it is not going to work (Supervisor, Go8 university).

Other supervisors commented on the need to clarify students' expectations of the supervisor-student relationship at the beginning of the study. One supervisor said,

I always give the students a little talk at the beginning I am never going to chase them, they have to take the ownership of this, if they fall by the wayside, that's their problem ... [but] they are all very engaged in their projects (Supervisor Go8 university).



Despite overall agreement regarding the need for higher levels of supervision support now than in the past, there were different views amongst supervisors regarding the scholarly relationship that supervisors should have with their students. These differences did not appear to be related to disciplinary differences. One research degree coordinator in a faculty with a relatively new research degree program put it this way,

I think there are a variety of relationships between staff and students, some see themselves as the top dogs” and it is a master-and-apprenticeship relationship, its handing out the morsels to the students. However, there also those who are more attuned to the students where the students’ skills and knowledge are close to that of the staff (Research degree coordinator, Go8 university).

Supervisors in some other faculties saw themselves as equals to their students and saw their role as supervisor as mentoring their students through the process. A humanities supervisor stated that she wanted,

to empower them [the students], the moment I take on the role of manager this goes. Some of my students are highly experienced and knowledgeable (Supervisor ATN university).

Others saw it quite differently, a research degree coordinator in an education faculty stated,

it is a more of a master and apprentice relationship than a partnership. The student might not think so, but there is still a relationship between the levels of knowledge and experience, particularly at the beginning (Research degree coordinator, ATN university).

Another supervisor from an education faculty said,

The relationship is so complex. To use psychological terms, you are working in the student’s zone of proximal development, so you do have to be challenging them, but you have to have good sense of where students is and pitch the challenge at right level. You don’t want to pitch the level so high that students lose confidence in themselves. So judging that is important. Lot of interpersonal skills are needed; you are all things to the student at all times (Supervisor, regional university).

Others felt they were the disciplinary experts, at least at the beginning of the research, and they expected their students to respect this. They expected their students to become the expert in their chosen field of study, but they saw themselves as remaining the expert in the doctoral process.

Interpersonal relationships between supervisor and students

An issue of major concern for many supervisors was that of interpersonal relationships between them and their students. As many interviewees pointed out, changes in research education and in scholarly relationships between supervisor and students have had implications for interpersonal relationships between supervisors and students. Perceptions of the kind of relationship that supervisors should have with their students seem to vary considerably, although to some extent this seemed to reflect expectation in different disciplines. As one research degree coordinator in the social sciences said,

what we do in social sciences is different to natural sciences. I think (in social sciences) it is a partnership between the practitioner and the



supervisor, it is to and fro between them (Research degree coordinator, ATN university).

The issue of interpersonal relationships with students generated considerable discussion from supervisors, especially those in humanities and social science disciplines. A number of supervisors raised questions regarding the degree to which they had become, or should become, involved with the personal lives of their students. There were different views here; some had become closely involved with their students and with issues impacting on their students' lives, while others kept a distance. As one supervisor put it,

It is all about personal relationships ... of course you need to be a good researcher as well (Supervisor, ATN university).

Supervisors generally placed great importance on interpersonal relationships with students but also saw these relationships as intersecting with overall purposes and outcomes of research education and as requiring a balancing act on the part of the supervisor. One supervisor described this as,

There's stuff you need to do with caring in personal relationships. So with students' personal disasters etc. where does supervisor sit here? How you manage this is hard. You need to balance between being supportive and caring, and recognising students' insecurity etc, and on the other hand you have a role in making sure the student passes, so you do need to be hard to ensure students are going to make it (Supervisor, ATN university).

Other aspects of interpersonal relationships raised by interviewees were more specific. A number of interviewees in regional universities cited tensions around supervising colleagues as students. Here supervisors needed to mentor their colleagues while also critiquing their work. A research degree coordinator commenting on this issue said,

the head of school was a supervisor and there were some concerns about the duality of the relationships between the head and staff members (who were being supervised by the head of school) (Research degree coordinator, regional university).

Another research degree coordinator in the same university commented,

If their (colleague) research performance is very lack lustre, it can cloud the friendship (Research degree coordinator, regional university).

Not all, however, agreed this was a problem. As one supervisor said,

I find having colleagues as students work fairly well here. Even though they are colleagues there is a quite a big gap between me and them (Supervisor, regional university).

Some female supervisors with male students raised the issue of gender relations between students and supervisors. A research coordinator who had had to intervene said,

We had two male students from similar cultures one of whom was not a problem in terms of taking direction and criticism from a female supervisor where as the other student did have a problem (Research coordinator, ATN university).



A supervisor at another institution said,

My very first student I supervised was a disaster, he was a similar age to me and he had trouble taking advice from me, because, I think, of my gender.

She went on to say later in the focus group,

One of them (a student) would not take advice from me and I am convinced that it is because I am a woman and he comes from a background where taking direction from women is not normal (Supervisor, Go8 university).

Support for supervisors

The fourth and final major theme evident in the interviews was that of support for supervisors. As survey and interviews outcomes from this project have indicated, today's supervisors need a wide set of tools. They must be experts in their fields of research, but increasingly they must also be able to take on roles as project managers, teachers of research, time managers, risk managers, and interpersonal negotiators. The nature of support for supervisors that is and/or should be provided by the universities is a central concern of this study, and, in the interviews, we asked research leaders, coordinators and supervisors their views on these matters. Their responses indicate that while interviewees were all positive about some aspects of available support, many believe that more/different support is needed. In what follows, interviewees' responses are elaborated under the following headings (although there are inevitably areas of overlap between these categories):

- becoming a supervisor/ development of new supervisors;
- professional development for experienced supervisors;
- the place of formal courses on supervision; and
- the value of mentoring.

Specific support/resources for:

- new supervisors; and
- more experienced supervisors.

Becoming a supervisor/development of new supervisors

Systematic support for the development of new supervisors was seen as important, by research leaders and coordinators, by experienced supervisors and by the new supervisors themselves. While, the consistent message from survey and interviews has been that many supervisors have reservations about the value of centralised formal courses (see below), interviewees generally agreed that a systematic program with some kind of central and formal component is necessary for new supervisors, and indeed it appears the majority of universities already have such programs in place.

Some differences of opinion were evident amongst interviewees regarding the ideal way of supporting new supervisors. Some interviewees suggested that universities should provide structured courses with sequences of modules to induct new supervisors, while others proposed a combination of central and more local support structures. Wherever they were held, there was general agreement that universities



needed at least to introduce new supervisors to the roles and responsibilities of supervision and to key QA structures and compliance issues. They also needed to alert new supervisors to possible pitfalls. As one supervisor commented,

Early Career Researchers should be made to attend workshops particularly these days where there are legal implications. There is a whole range of traps you can fall into. When I started as an academic it was assumed that you would absorb all this stuff by osmosis and no one was taught how to teach (Supervisor, Go8 university).

The consensus however, was that while centralised formal courses were useful for covering initial requirement of new supervisors, they were not enough, and that other kinds of support needed to be provided at a more local level. Many interviewees saw mentoring as being particularly important for new supervisors. As one research degree coordinator said,

Mentoring can play an important part in development. When a new person arrives they sit at the elbow of someone. We try to make sure a new person is put with someone who is highly experienced (Research degree coordinator, ATN university).

Interviewees' comments reveal some differences in university policy regarding support for new employees in academia. In some universities the doctorate appears to be seen only as the first phase of becoming an independent researcher, while in others there is an expectation that new doctoral graduates will very quickly become fully-fledged researchers and supervisors. Differences appear to occur between those with established research degree programs and those with new programs and fewer available supervisors. A research leader from a Go8 university, for example, said,

I think the notion of the PhD being a single boundary will become less significant but rather a much more fluid arrangement will occur around the ECR [Early Career Researcher]. ECRs could have a 10 year duration of which the PhD is a part. We are putting a lot of effort into ECRs. In previous comments we talked about the PhD student being able to do independent research, but what we want now is for a person to be an independent researcher, that is someone who can do the research, publish, get grants and be able to provide the income for their salary. That is why we are looking at a 10 year window (Research leader, Go8 university)

. In contrast, a research leader from a regional university said,

The moment that staff graduate from their PhD they are expected to be able to supervise. There needs to be support for them that does not overwhelm them. I know some want a bit of time off between completing and supervision (Research leader, regional university).

A supervisor from this university commented,

there is pressure as a junior member of staff to take on supervision. You have a tendency to take on students who you probably should not (Supervisor, regional university).

In sum, it appears that most universities already have in place some kind of structured programs for the induction of new supervisors. Outcomes from both survey and interviews indicate that these programs should include some centralised formal components where supervisors are familiarised with the roles and responsibilities of supervision and with QA structures and compliance issues. They should also include



faculty-based programs that provide a range of formal and less formal ongoing support structures: these could include faculty-based courses that address discipline specific implications of QA and compliance; structured and less structured strategies to address relevant processes and procedures of supervision; and (most importantly) systematic mentoring programs. While most universities already provide a healthy range of centrally located course, outcomes from this project suggest that the more local support is very hit and miss. It is this element in particular that needs to be strengthened.

Professional support for experienced supervisors

While there was broad agreement amongst all interviewees on the need for some formal structure in the induction of new supervisors, there was considerable disagreement on the need for, and nature of, any ongoing professional development of experienced supervisors. Indeed a few interviewees were sceptical about the value of any ongoing professional development for experienced supervisors, and many rejected the need for compulsory participation.

Some differences in perspective were evident in interviews between the views of research leaders and coordinators on the one hand, and the views of supervisors on the other. Research leaders and coordinators who have responsibility for research education and for QA and tended to take a big picture view of support for experienced supervisors. They were aware of the scale of change in research education and implications for changing supervision practices. They were also aware of pressure from government policy and from universities for QA and compliance with specific regulations, and the need to be able to enhance quality of supervision. And they were the ones who were required to intervene when problems arose with students. Thus they were aware that not all experienced supervisors had exemplary practices. Not surprisingly, therefore, they tended to be more positive about the value of formal courses for experienced supervisors. However, they were also well aware of the resistance of many supervisors to such courses. As one research leader said,

This is a quote from an academic from a recent training session feedback form. I don't know how you deal with someone like that. "No more training please I am an academic and not a performing monkey". (Research leader, Regional University).

Comments from many supervisors, and particularly from those who are more experienced, confirmed that they do not find such courses engaging or useful. As one supervisor said,

I am a bit weary of supervisory courses because it strikes me that a lot of the abilities to supervise can only be learnt on the job. There are pushes to formalise them but this often makes them less effective. Formulaic workshops don't work, but something like this [the focus group discussion] with a large group would be good (Supervisor, Go8 university).

Another experienced supervisor said,

My experience is that they [formal] courses are fairly useless for me. They are too generalised. For me the best way to learn is on the job. We have a younger member of staff who has just got his first PhD student and I am mentoring him. To me that is how you learn (Supervisor, Go8 university).



There was also a feeling amongst supervisors that centrally provided courses were in some way pushing the 'party line' on how students should be supervised and supervisors resented this. One supervisor said,

It is the old "let's put the chairs in a circle" scenario. I feel I have to put my intelligence on a shelf to "buy in". They are well intentioned... I am very wary of a top down approach to interacting with your students (Supervisor, Go8 university).

There were, however, a number of experienced supervisors who felt they did gain some insight into aspects of their supervision through formal courses. One supervisor remarked,

I have done all the training workshops here. I think you always take something away from them but it more often than not confirms things that you already have. However, I believe they are not a waste of time as they serve a function, but in terms of improving supervision, the apprenticeship model is more effective (Supervisor, regional university).

Interviewees' responses also varied in relation to the perceived relevance and quality of the course. One supervisor said,

They (formal courses) are variable in terms of the quality. Sometimes they put on a person who is fantastic. Other times you think you could do a lot better with your time. I always find courses more useful if they are applied. For example, where you can break into groups and discuss the topic. Sometime[s] having other disciplines present brings different views on a subject. (Supervisor, regional university).

Research leaders and coordinators reported that universities held different positions in regard to compulsory attendance at supervisor professional development courses. At one institution, attendance was compulsory if a member of staff wished to be on the supervisor register, but at others attendance was voluntary. As some research leaders and coordinators said, it was often the supervisors who most needed professional development who were least likely to attend supervision development courses. For this reason, some universities are considering a move to compulsory attendance, although interviewees reported reservations about such a move. One research leader said,

The DVC wants to make a training programme compulsory for academics and I support that. But I have not got anything good enough for that yet (Research leader, regional university).

A research leader at another university took a slightly different view, saying that supervision training should not be treated differently to other types of academic development. He said,

I don't think programs should be compulsory unless you know they are good, so you don't waste peoples' time. They also need to be embedded in a broader view of continuing professional education for academics and so supervision should not be singled out. (Research leader, ATN university).

In other institutions the decision regarding compulsory attendance is made at the faculty level.

While research leaders and coordinators could be described as being somewhat ambivalent about compulsory attendance at supervision courses, supervisors were much less ambivalent. The majority were not in favour of compulsory attendance,



although a few felt that compulsory participation may expose supervisors to new ideas and encourage them to reflect on their supervisory practices. Overall, however, the view was that compulsory attendance would be counter-productive.

In sum, the ongoing professional development of experienced supervisors presents a major challenge to universities. On the one hand, with increasing formalisation and accountability of research education, universities are pressured to have in place formal procedures for provision and monitoring of supervisor development – and the obvious way to do this is through provision of centralised formal courses. On the other hand experienced supervisors are ambivalent (at best), or highly critical (at worst) of such courses. They are also generally resistant to the move towards compulsory attendance at such courses. Outcomes from the project therefore indicate the need for universities to rethink strategies for ongoing development of experienced supervisors. Rather than putting resources and expertise into centralised courses, outcomes from this project indicate that universities should use at least some of their centralised resources to facilitate and support more systematic and structured programs locally. It also suggests the need for more creative solutions to supervisor development beyond the standard course or workshop. Where universities require supervisors to be formally registered, this requirement could be tied to faculty-based programs on professional development (so that the faculty rather than the central university would be responsible for supervisor registration). Such programs would usefully include a systematic mentoring program.

The value of mentoring

Mentoring has consistently emerged as a major issue in outcomes from both survey and interviews. Survey responses highlighted the importance of experience in supervision and of opportunities to work collaboratively with colleagues in learning about supervision. Responses from interviewees confirmed this finding. Research leaders, coordinators and especially supervisors spoke very positively about the learning that occurred when new supervisors worked with more experienced supervisors. The benefits included the relevant and practical nature of learning; and learning at point-of-need. Interviewees pointed out that this learning is a two-way process and that more experienced supervisors also benefit from mentoring as they are pushed to explain and reflect on their own supervisory practices. In addition, interviewees said they enjoyed the mentoring process. As one supervisor said,

I often co-supervise and also mentor colleagues. I enjoy mentoring others. (Supervisor, ATN university).

Despite the overall positive response, a number of research leaders and coordinators pointed to possible problems with mentoring. Their primary concern was with what knowledge and what practices were being learned. As one research leader explained,

Mentoring has a role but I worry about passing on bad habits. ... You can almost hear, if you put your ear to the ground, you can hear all this terrible practice going on. There is really a great danger of bad practice being passed on (Research leader, regional university).

Some universities had addressed this concern. A research leader, commenting on this said,

We do expect principal supervisors to mentor associate supervisors. We have grants to allow this to happen. We deal with the potential of bad practice by various means including questionnaires and one-to-one discussion (Research leader, Go8 university).



Another concern expressed by research leader and coordinators was the challenge of setting up good mentoring relationships. As a research degree coordinator said when reflecting on this issue,

I think mentoring could work, but it is a bit tricky; matching mentors with mentees is the hardest part. If people can find their own, it can work, I have seen problems where they have been assigned. I think some cross disciplinary mentoring is beneficial. You can get a fresh view (Research degree coordinator, regional university).

Another research degree coordinator said,

I think mentoring could be useful but you would have to be very careful about the people chosen to be the mentors. You would need to ensure that they had the skills and knowledge that you wanted to be passed on (Research degree coordinator, regional university).

Research leaders and coordinators were also concerned about implications of mentoring programs for workloads. As some pointed out, if mentoring is formalised, the issue of workload would have to be addressed. One research degree coordinator said,

We tried to create formal mentoring structures here, but they have always fallen down because of workload issues. I would be concerned that if it becomes structured and formalised it would become a restrictive and bureaucratic nightmare (Research degree coordinator, ATN university).

Supervisors were also aware of some of the challenges associated with mentoring. Like research leaders and coordinators, they were aware of the potential for mentoring of bad practices. Some supervisors suggested mentoring programs needed to be more systematic,

No one has explicitly stated that principal supervisors are expected to mentor inexperienced supervisors. The whole notion of rewarding experienced supervisors is something that should be considered (Supervisor, ATN university).

However, other supervisors were concerned that formalisation of mentoring could be counterproductive. One supervisor said,

It (mentoring) has to be informal, we have looked at it and we were not happy with a formal mentoring system (Supervisor ATN university).

Survey and interview responses provide evidence of the value supervisors place on simply being able to talk about supervision. The most frequent comment from supervisors in interviews was that they felt the knowledge gained through this process was relevant and timely. Interviews also indicated the majority of supervisors favoured more localised sites of learning than those provided by centralised programs. For some supervisors their preferred methods of gathering advice or knowledge were simply through 'corridor conversations' and through learning on the job by doing supervision. One supervisor stated,

I tend to be sceptical about education when it comes to supervisor development. I don't think you can learn the skills from others. I think it is a matter of experience and personality. (Supervisor, Go8 university).



Another supervisor said,

Some colleagues: I have learnt a lot by watching them. Others I have felt that I needed to take a step back and just be supportive when I was required (Supervisor, regional university).

As with mentoring, many supervisors recognised there were some inherent dangers in these informal ways of learning. Their major concern again was the possibility of passing on bad practices. In relation to this, one supervisor said,

Sometimes, senior members of staff are a problem. However, if I were left alone I would have been totally lost (Supervisor, Go8 university).

Other supervisors emphasised the need for individual supervisors to take responsibility and initiative in their own learning. As one supervisor put it,

The teacher in me says if there is anything you can learn, you can teach it. The other side says that experience is important. Good supervisors are self-regulated, they know when to learn more, I am still learning all the time. For me it is about having the time. I need time to do the development. Supervisors have to take the control of their own growth and development (Supervisor, ATN university).

In sum, despite some reservations, responses from the survey and interviews in this project have consistently pointed to the value of mentoring as a way of supporting supervisor development. Outcomes from the project thus suggest universities should provide resources that facilitate and support mentoring programs within faculties. The emphasis here would be on engaging experienced supervisors in supervision development. Mentoring programs could also build in cross-disciplinary discussions of approaches and research techniques. However, in developing mentoring programs, there needs to be acknowledgment of some of the potential challenges: the possibility of mentoring bad practice (and how to avoid this); the need to pair compatible mentors and mentees; the need to maintain flexibility within the program and to allow mentors and mentees some agency in their working relationships. Universities also need to acknowledge the workload implications.

A related message from the project is the value of simply talking about supervision. To some extent this is consistent with the overall push toward making supervision more visible, but the message from supervisors is that there is great value in informal, situated, local, at point-of-need conversations between less and more experienced supervisors. Outcomes from the project suggest that universities should put resources into faculties to facilitate and support such informal learning opportunities.

Specific support and resources

In interviews, supervisors were asked what kinds of support and resources were most needed to help them fulfil their role as supervisors more effectively. One of the most consistent responses from supervisors was the need for more support with academic writing. Predictably this was a major issue for supervisors working with international students studying in their second language. However, as many supervisors commented, it is also an issue for many local students. While supervisors recognised the difficulties their students were experiencing with academic reading and writing, they felt they did not have the resources or necessary knowledge to help them. A consistent plea from supervisors was for more help in this area. Although the majority of participating universities had support unit in place, some supervisors were reluctant to send their students to them, as they thought the support provided in the central unit was too generalised. One supervisor commented,



I have a student who has problems with writing. There are centrally provided resources to help with such situations but my fear is that what comes out of it is so generalised that it is not going to have any bearing on my discipline (Supervisor, Go8 university).

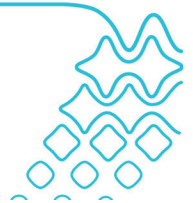
In addition to academic writing, supervisors identified the following areas where additional resources were needed:

- Getting students to publish – given the pressure to increase publication rates during candidature a number of supervisors expressed a wish to see resources put in place to support this;
- Supervising students outside of Australia – a number of supervisors were supervising students who were physically located outside of Australia. Supervisors requested more advice and guidance on how best to do supervision in this situation, for example, how do you ensure ethical guidelines are being met when the research is taking place in a language other than English;
- Supervising inter-disciplinary projects – with the growing emphasis on doctoral students undertaking inter-disciplinary projects, supervisors requested more guidance and support in how to supervise such projects;
- Dealing with demanding students and situations– some supervisors asked for more support to enable them to recognise and avoid problem situations; and more support in dealing with problems if and when they arose. Some examples include: where students resist advice of supervisors; conflicts that are related to gender issues; challenges of supervising colleagues;
- Dealing with demanding supervisors (for research degree coordinators) – how do faculty managers who have responsibility for supervision deal with difficult supervisors. Some coordinators requested support both to enable them to prevent problem situations and to deal with problems when they arose (for example, a breakdown of the relationship between the student and the supervisor, where the fault lay mainly with the supervisor); and
- Generic skills for students – where universities were mandating the development of generic skills, supervisors requested more guidelines and resources to incorporate these generic skills into their supervision.

In sum, survey and interview outcomes suggest that universities should take more note of the challenge many research students (international and local) face with academic English, and the related challenge faced by their supervisors. Universities should address this challenge by providing resources at the local/faculty level, in addition to centralised resources.

In addition, universities should take account of supervisors' requests for further support in the areas of:

- supporting students' publications;
- supervising students outside of Australia;
- supervising inter-disciplinary projects;
- dealing with demanding students and demanding situations; and
- developing students' generic skills for students.



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Appendix 1 Survey instrument

Section one: About you

1. You are:

Male Female

2. Please select your major academic discipline area.

3. Please select the university where you supervise the majority of your postgraduate research students.

4. How many students do you currently supervise as a:

	0	1	2	3	4	5	6	7	8	9	10 or more
doctoral principal supervisor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
doctoral associate or co-supervisor/panel member	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
masters by research principal supervisor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
masters by research associate supervisor, co-supervisor or panel member	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. How many students have you successfully supervised to completion as a:

doctoral principal supervisor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
doctoral associate supervisor, co-supervisor or panel member	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
masters by research principal supervisor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
masters by research associate supervisor, co-supervisor or panel member	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Section two: Your research supervision

We begin the questionnaire by asking about what you regard as priorities in your work as a supervisor and about your own practices as a supervisor.

6. Please indicate the level of priority you would give to each of the practices listed below:

{scale L: low, M: medium, H: high, VH; very high}

	L	M	H	VH
A. Keeping abreast of latest research and literature in my field	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Maintaining an up-to-date knowledge of different research methodologies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. Providing feedback to my students within an agreed time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Having the capacity to advise my students on academic writing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E. Having the skills to attend to students who are more than usually demanding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
F. Maintaining a productive relationship with my students over the entire period of their candidature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
G. Finding an appropriate balance between providing sufficient support for my students while fostering their ability to work independently	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
H. Finding time for effective supervision amongst my competing work commitments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I. Facilitating wider academic contacts and networks for my students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
J. Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please specify



7. When you supervise research students do you:

(The items in the question below are based on those in a major cross institutional survey of research students. Your responses in this question will enable us to compare factors that are important for supervisors with those that are important for students.) {scale N:never, S:sometime, O:often, U:usually, A; always}

1. Assist your students to formulate their research topic	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Challenge your students intellectually	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Help your students plan and refine the viability of their project	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Introduce your students to relevant current literature	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Encourage your students to write early	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Advise your students on problem framing and problem solving	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Advise your students on critical aspects of their research thereby extending their awareness of possibilities	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Provide advice on the logistics for producing a thesis document	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Negotiate a program of study and research with your students	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Direct your students when it seems needed	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Negotiate explicit ground rules for supervision with your students from the beginning of their candidature	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Promote good interaction and learning between your students and others in the research area	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Approach your supervision flexibly depending upon the stage of your students' research projects	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Put in effort to ensure your students get a good start	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Provide your students with information about your availability for planning purposes	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Initiate contact with your students	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Negotiate your availability with your students	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Demonstrate an interest in the well being of your students	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Be approachable, responsive and affirming to your students	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Encourage your students to publish during and/or on completion of their theses	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



21. Direct your students to leading researchers	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. Encourage your students to network within your university	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. Introduce your students to professional networks	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Assist your students to progress their career goals	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. Advise your students on opportunities for relevant experiences	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. Model effective research practice as an active researcher	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. Allow your students to take different research approaches (methodological and theoretical) to your own	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. Critically and openly discuss your research practices with your research students	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. Periodically review your supervisory process and interaction with your students	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. Carry out your supervisory duties professionally	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. Encourage your students to engage in open/critical discussion with you on research practices	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. Assist your students to obtain resources for seminars and conferences	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. Assist your students to meet administrative requirements in an efficient and timely manner	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34. Keep your students informed about procedures and issues related to intellectual property rights	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35. Devote sufficient time to your students	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36. Listen with attention by regularly checking for mutual understanding	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37. Ensure official requirements are met (e.g. ethics clearance)	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38. Respect the knowledge and expertise your students bring to their candidature	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39. Encourage your students to develop and evaluate their own ideas as you discuss what they are doing	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40. Help arrange for your students to present their research at seminars and conferences	N	S	O	U	A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41. Other (please specify)					



Section three: Your views on the development and support of supervisors

In this section we are seeking your views on what shaped your own development as a supervisor. We are also interested in your views on the informal and formal support that is necessary to develop supervisors who are capable of effective supervision of research students.

8. What influenced your own development as a supervisor?

(you may tick as many boxes as you wish)

- How you were supervised when you were a research student
- Working as a co-supervisor with a more experienced colleague
- Reading about effective supervision practices
- Discussions with colleagues
- Participation in professional development sessions
- Feedback from students
- Refining your supervision practices based on reflections of your experiences
- Your experiences over time of being a supervisor
- Other

Please specify

9. What, if any, formal research supervision training sessions have you undertaken?

	Have you undertaken a session of at least one hour on this topic?		If you have undertaken such a session, how useful did you find it ? {scale N: not very to V: very }					Was undertaking this session compulsory?	
	Y	N	N				V	Y	N
A. Codes of practice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Ethics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. Managing candidature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Examining theses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E. Academic writing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
F. Dealing with problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
G. International students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
H. Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I. Please specify									



10. Does your faculty/university provide adequate support for you in the following areas:

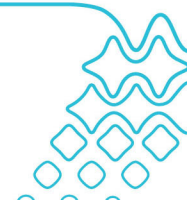
{scale NAA: not at all, P: partly, FW: fairly well, VW: very well, NS: Not sure}

A. Supervision is recognised adequately in your workload	NAA	P	FW	VW	NS
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Funding for your participation in conferences	NAA	P	FW	VW	NS
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. Student support e.g. academic writing, thesis development etc	NAA	P	FW	VW	NS
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Opportunities to be mentored by other supervisors	NAA	P	FW	VW	NS
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E. Support for dealing with problematic students	NAA	P	FW	VW	NS
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
F. Support for your further professional development as a supervisor	NAA	P	FW	VW	NS
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
G. Funding support for your students, e.g. conference fees, scholarships etc	NAA	P	FW	VW	NS
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
H. Resources, e.g. ICT, library, other equipment	NAA	P	FW	VW	NS
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I. Other	NAA	P	FW	VW	NS
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
J. Please specify					

11. How important do you see the following for your own ongoing development as a supervisor?

{scale NI: not important, MI: moderately important, E: essential}

A. Extended repertoire of supervisory strategies	NI		MI		E
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Increased understanding of institutional policy and procedural requirements	NI		MI		E
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. Enhanced competency in interactional and communications skills	NI		MI		E
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Enhanced understanding of the facilitation of learning in one-to-one and group settings used in supervisory practice	NI		MI		E
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E. Enhanced understanding of IT mediated communications for supervision and supervisory practices	NI		MI		E
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
F. Greater understanding of the literature on the scholarship of supervision	NI		MI		E
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
G. Greater self-awareness of own conceptions of research and supervisory practice	NI		MI		E
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
H. Other	NI		MI		E
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



I. Please specify

Section 4 Your views on research

In this section we ask about your views on research and on being a researcher. We also explore your views on the future directions of doctoral education. Your responses to questions in this section will help us locate demands and pressures of research supervision within the broader context of research priorities in universities.

12. How important are the following for you in undertaking your research:

{scale VU: very unimportant, SU: somewhat important, N: neutral, SI: somewhat important, VI: very important}

A. Investigating questions of personal interest to me	VU	SU	N	SI	VI
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Fulfilling expectations of my job	VU	SU	N	SI	VI
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. Making a contribution to a larger disciplinary or social group	VU	SU	N	SI	VI
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Ensuring my continued employment	VU	SU	N	SI	VI
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E. Discovering something new in my disciplinary area that enables me to become known in my field	VU	SU	N	SI	VI
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
F. Creating a sense of personal achievement	VU	SU	N	SI	VI
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
G. Investigating an issue that has been puzzling me	VU	SU	N	SI	VI
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
H. Contributing to social, political or community change	VU	SU	N	SI	VI
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I. Other	VU	SU	N	SI	VI
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please specify

13. I see research primarily as a process of:

A. Identifying and solving a problem using a set of specific research procedures or skills	VU	SU	N	SI	VI
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Addressing broad disciplinary issues of importance to my field or to society	VU	SU	N	SI	VI
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. Gathering of information or collection of data	VU	SU	N	SI	VI
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Discovering truth	VU	SU	N	SI	VI
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E. Uncovering what has been hidden through reinterpretation or 're-search'	VU	SU	N	SI	VI
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
F. Investigating interesting questions	VU	SU	N	SI	VI
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



G. Other	VU	SU	N	SI	VI
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. When I publish or report on my research I am primarily seeking to					
A. Make an impact on my field	VU	SU	N	SI	VI
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Share my research with others engaged in my field	VU	SU	N	SI	VI
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. Gain feedback from peers; engage in academic debates	VU	SU	N	SI	VI
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Make my research known to others	VU	SU	N	SI	VI
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E. Improve my research	VU	SU	N	SI	VI
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
F. Extend my understanding of theoretical and conceptual issues	VU	SU	N	SI	VI
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
G. Encourage change amongst relevant social groups or communities	VU	SU	N	SI	VI
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I. Sustain/advance my career	VU	SU	N	SI	VI
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I. Other	VU	SU	N	SI	VI
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please specify

15. What do you see as the most important future changes and challenges in research education?

16. Are there any other aspects of supervision or supervisor development you would like to comment upon?



Appendix 2 Results from survey

Table 1 Survey population by sex

	Number	Percent
Female	832	44.2
Male	1015	53.9
Not entered	37	2.0
Total	1884	100.0

Table 2 Survey population by ANZSRC Fields of research

	Number	Percent
Agricultural and Veterinary Sciences	50	2.7
Biological Sciences	169	9.1
Built Environment and Design	24	1.3
Chemical Sciences	51	2.7
Commerce, Management, Tourism and Services	161	8.6
Earth Sciences	25	1.3
Economics	53	2.8
Education	122	6.5
Engineering	70	3.8
Environmental Sciences	49	2.6
History and Archaeology	51	2.7
Information and Computing Sciences	103	5.5
Language, Communication and Culture	109	5.8
Law and Legal Studies	29	1.6
Medical and Health Sciences	365	19.6
Philosophy and Religious Studies	34	1.8
Physical Sciences	34	1.8
Psychology and Cognitive Sciences	125	6.7
Studies in Human Society	147	7.9
Studies in the Creative Arts and Writing	45	2.4
Technology	8	0.4
Mathematical Sciences	40	2.1
Total	1864	100.0



Table 3 Comparisons of Australian 2006 doctoral students and survey population by ASCED BFOS

	Australian 2006 doctoral students Percent	Australian survey population Percent	New Zealand Survey population Percent
Agriculture, Environmental and Related Studies	4.5	2.6	3.0
Architecture and Building	1.3	1.5	0.5
Creative Arts	4.0	2.6	2.1
Education	8.6	6.8	6.2
Engineering and Related Technologies	10.4	4.5	3.2
Health	12.8	21.8	12.4
Information Technology	4.0	5.3	6.4
Management and Commerce	8.5	6.8	14.5
Natural and Physical Sciences	20.7	20.4	18.1
Society and Culture	25.2	27.9	33.7

Table 4 Summary of levels of current supervision

Level of supervision	Number	Percent	Cumulative percent
Doctoral only	971	51.5	51.5
Doctoral and masters	788	41.8	93.4
Masters only	79	4.2	97.6
None	46	2.4	100.0
Total	1884	100.0	

Table 5 Combination of current supervision duties

	Doctoral principal supervisor	Doctoral associate supervisor	Masters principal supervisor	Masters Associate supervisor	Total
Doctoral principal supervisor	228	1012	529	270	1390
Doctoral associate supervisor	1012	219	493	319	1381
Master principal supervisor	529	493	34	209	668
Masters Associate supervisor	270	319	209	28	409

Table 6 Distribution of current supervision duties

Doctoral supervision	Doctorates only	Masters and doctorate	Masters only	Neither	Total
Principal	228	150			378
Principal and associate	524	448			1012
Associate	219	150			369
None			79	46	142
Total	971	788	79	46	1884



Table 7 Average number of research students per principal supervisor currently supervising a student (N = 1390)

	Average number of students
Doctoral students as a principal supervisor	3.02
Doctoral students as an associate supervisor	1.83
Master students as a principal supervisor	0.73
Master students as an associate supervisor	0.33
Average number of HDR students supervised	5.91

Table 8 Average number of research students per principal supervisor currently supervising a student by university group

	ATN	Go8	IRU	New Zealand	Other
Doctoral students as a principal supervisor	3.35	3.00	3.22	2.63	3.18
Doctoral students as an associate supervisor	2.03	1.98	1.59	1.66	1.80
Master students as a principal supervisor	0.75	0.42	0.60	1.42	0.50
Master students as an associate supervisor	0.40	0.27	0.22	0.39	0.35
Average total of HDR students supervised	6.53	5.68	5.64	6.11	5.84

Table 9 Average number of research students per principal supervisor currently supervising a student by ASCED Broad field of study

	Average number of Doctoral students as a principal supervisor	Average number of Doctoral students as an associate supervisor	Average number of master students as a principal supervisor	Average number of Master students as an associate supervisor	Average number of HDR students supervised
Creative arts	2.36	1.56	1.16	0.93	6.00
Education	2.55	1.93	0.82	0.54	5.84
Architecture and building	2.70	2.04	0.61	0.26	5.61
Society and culture	2.46	1.87	0.82	0.39	5.54
Information technology	2.36	1.59	0.60	0.24	4.78
Information technology	2.36	1.59	0.60	0.24	4.78
Management and commerce	2.06	1.53	0.76	0.37	4.72
Natural and physical sciences	2.11	1.83	0.47	0.26	4.66
Health	1.92	1.54	0.60	0.41	4.47
Agriculture, environmental and related studies	2.06	1.58	0.54	0.24	4.42



Table 10 Supervisor role by completions

	Number of completions - percent										
	0	1	2	3	4	5	6	7	8	9	10 or more
Doctoral students as a principal supervisor	43.0	11.8	8.9	6.8	5.5	4.4	3.6	1.9	2.0	1.3	10.8
Doctoral students as an associate supervisor	46.9	15.6	12.1	7.2	4.7	3.8	2.5	1.0	0.5	0.4	5.3
Master students as a principal supervisor	47.4	13.5	8.9	6.0	3.9	3.0	2.5	1.8	1.2	1.0	10.7
Master students as an associate supervisor	66.7	11.0	7.2	4.1	2.4	1.3	0.8	0.5	0.6	0.3	5.1

Table 11 Average number of completions by type of supervision

	Average number of completions
Doctoral students as a principal supervisor	2.64
Doctoral students as an associate supervisor	1.81
Master students as a principal supervisor	2.34
Master students as an associate supervisor	1.21

Table 12 Average number of doctoral completions as a principal supervisor by university group

	Average number of completions
Go8	2.98
ATN	2.53
IRU	2.48
Other Australian	2.46
New Zealand	2.51
All	2.64



Table 13 Average number of doctoral completions as a principal supervisor by ANZSRC fields of research

ANZSRC fields of research	Average number of completions
Psychology and Cognitive Sciences	3.58
Agricultural and Veterinary Sciences	3.58
Engineering	3.37
Built Environment and Design	3.33
Biological Sciences	3.24
Environmental Sciences	3.22
Earth Sciences	3.04
Chemical Sciences	2.92
Education	2.92
History and Archaeology	2.90
Economics	2.85
Mathematical Sciences	2.73
Studies in Human Society	2.60
Language, Communication and Culture	2.51
Information and Computing Sciences	2.41
Philosophy and Religious Studies	2.26
Technology	2.25
Physical Sciences	2.15
Studies in the Creative Arts and Writing	2.13
Commerce, Management, Tourism and Services	2.03
Medical and Health Sciences	2.02
Law and Legal Studies	1.55
All	2.64

Table 14 Levels of experience as a doctoral principal supervision to completion

	Number	Percent
No experience (no doctoral completions as a principal supervisor)	810	43.0
Experienced (1 - 5 doctoral completions as a principal supervisor)	705	37.4
Very experienced (6 and over doctoral completions as a principal supervisor)	369	19.6

Table 15 Current doctoral principal supervisors by level of experience

	Number	Percent
No experience	393	28.3
Experienced	644	46.3
Very experienced	353	25.4
Total	1390	100.0



Table 16 Doctoral completions as an associate supervisor of new principal supervisors

Number of doctoral completions as an associate supervisor	Number	Percent
0	238	60.6
1	85	21.6
2	43	10.9
3	14	3.6
4	7	1.8
5	3	0.8
6	2	0.5
10	1	0.3
Total	393	100.0



Appendix 3: Interviews questions for research leaders and research coordinators

Interviews with research leaders and research coordinators addressed the following:

The changing nature and purposes of doctoral research: to what extent is doctoral research changing; are purposes of doctoral education changing? What are likely future directions in doctoral education?

- what are the likely implications of any changes for doctoral supervision
- what are the likely implications of changes for research education training.

Questions

1. Changing nature of doctoral research

Preamble:

Earlier in the project, we held a Symposium of invited experts. Symposium, participants highlighted the changing nature of doctoral education:

- importance of new modes of knowledge production;
- competing pressures on doctoral education:
- increased diversity; and
- challenges to traditional ways of thinking about doctoral education.

They also pointed to considerable discussion (and disagreement) in universities about purposes of doctoral education, and they identified (amongst others) the following range of purposes:

- preparation of employment ready researchers;
- preparation for research leadership
- engaging in professional development

Questions

We are interested in your views here. Would you agree that the context and purposes of doctoral education are changing? If so, how?

Possible probes:

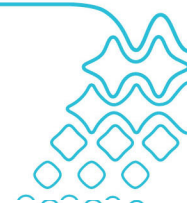
How are changes evident in your university and/or faculty?

What do you see as priorities and future directions for doctoral research?

Where do you see doctoral education going in the future?

Who is the project leader in the PhD (supervisor or student) and has this changed?

2. Implications for doctoral supervision



Preamble:

In addition to the changes mentioned in the previous question, Symposium participants + survey respondents have commented on increasing demands being placed on supervisors.

Specifically, they commented on:

the need for supervisors to balance *institutional demands* (of compliance, efficient completions, risk minimisation etc)

with demands of *supporting their students*.

Questions

Do these comments reflect your own perceptions of pressures faced by supervisors in your university/faculty?

What do you think makes a good supervisor? I.e. What does a supervisor need to know and do to be a good supervisor?

More generally, what implications do you see for the nature of doctoral supervision in the future?

Possible probes:

Are you aware of increasing pressures on supervisors in your own university/faculty?

What are your institutional expectations for supervisors (e.g. project leader, responsible for students' ethic compliance; responsible for national code of practice' expected to provide career advise; expected to advise on preparation of conference papers and publications; advise on commercialisation)

What do you see as priorities in supervision: supervision as teaching/pedagogy; as being a good researcher (who knows about research design etc); as an expert in disciplinary knowledge?

What implications do pressures/ future directions have for the roles and relationships of supervisors and students?

3. Implications for doctoral supervision training

Preamble;

Our major interest in the project is with doctoral supervision training and with ways that universities can best support doctoral research education. One issue that arose from survey responses was the possibility of better utilising different sites of learning: for example, combinations of central support; in-faculty support, and support via mentoring.

We are interested in your views on these issues.

Questions

What supervisor support currently exists in your faculty/university?



In the light of your responses to the previous questions, what you see as priorities for research supervision training? Are there ways that you think research supervision training will need to be reconceived or improved in the future?

Possible probes

What do you think are the strengths of research supervision training in your university/faculty?

Whose responsibility is supervision support and training at this point in time?

In what ways (if any) could research supervision training be strengthened in your university/faculty?

4. Nature of supervisor support programs

Questions

If you were designing a program to support supervisors during their first few years of being a supervisor, what would the program look like?

Possible probes

what would you want included

where would the program(s) be located

what would be compulsory/optional

would this be part of a supervisor registration process

what follow up support would you like to see (for more experienced supervisors)

5. Any other comments

Is there anything else that you would like to add?



Appendix 4: Interview questions for supervisor focus groups

Focus group discussions with supervisors addressed the following:

- views on purposes and priorities of doctoral research supervision
- challenges of being a supervisor
- influences on own ongoing development as a supervisor, and
- priorities in research supervision training and supervisor support

Questions

1. Views on purposes and priorities of doctoral research supervision

Preamble:

Symposium participants indicated there is considerable discussion (and disagreement) in universities about purposes of doctoral education, and they identified (amongst others) the following range of purposes:

- preparation of employment ready researchers;
- preparation for research leadership
- engaging in professional development

Questions

What do you see as the major purposes of doctoral education, and what do you think are the most important outcomes for your students?

Possible probes:

What do you most want your students to take with them from their doctoral degree?

Is successful completion of a thesis the only important outcome, or are other outcomes also important?

What did you take from your own doctoral studies?

2. Challenges of being a supervisor,

Preamble:

In symposium discussions and in responses to survey, participants raised the issue of increasing pressure on supervisors. They noted that supervisors are caught between:

- institutional pressures (demands of compliance, efficient completions, risk minimisation etc) and
- pressures of supporting their students.

They also suggested that supervisors are caught between:



- demands of supervision and
- other work demands (of teaching, administration, research and publications).

We would like to explore this issue in more depth with you.

Questions

What are your experiences of being a supervisor? What pressures are you aware of, and have these pressures changed in recent years?

Possible probes

How do you balance these pressures?

How effectively are you able to do this?

Is there any one aspect of your work-load that misses out as a result of competing pressures (e.g. your own publications, time with students)?

Are you working with more diverse students (as some survey participants suggested)?

If so, what are the implications for your work as supervisor? More/different pressures?

3. Influences on own ongoing development as a supervisor

Preamble:

The major focus of project is on ways that universities can best support research degree education.

To help us here, we are interested in what has been most influential in your own on-going development as a supervisor.

Our survey respondents nominated (in order of frequency)

own experiences of being supervised (usually negatively experiences so participants try not to follow their own supervisors)

working with colleagues and peers

experiences since becoming a supervisor (i.e. experiences in actually being a supervisor)

learning from supervision workshops (both good and bad)

Questions

Do these factors reflect what has influenced you in becoming a supervisor?

What has been most important for you in shaping the way you go about supervising your students?

Possible probes

Have other factors or experiences influenced you?



Have your views on priorities and outcomes in doctoral research shaped your practices as a supervisor?

If so, how?

What are the qualities of a good supervisor? I.e. what does a good supervisor need to know and what do they need to do?

4. Priorities in research supervision training and supervisor support

Preamble

Another major focus in the project was effective research supervision training. An issue that arose from survey responses was the possibility of better utilising different sites of learning: for example, combinations of central support; in-faculty support and support via mentoring.

We are interested in your views on supervision training and supervisor support

Questions

In your experience, what has been the most useful training or support (either formal or informal) that has helped you as a supervisor?

What additional/different support (if any) would you like to see in your university?

Do you believe that all supervisors should attend courses to be accredited as a supervisor? Why, why not?

Possible probes

What do you think is the value of formal courses in supervision development?

Which courses, for whom and at what point in the supervisors' development?

If (as survey respondents suggest) mentoring is an important influence of supervisor development, should we have more systematic mentoring programs?

What courses, programs, activities realistically would you participate in, and at what stage of your development as a supervisor?

Are additional/different kinds of support needed for new supervisors?

5. Any other comments

Is there anything else that you would like to add.

