

## A Collaborative Partnership approach to Virtual Research Supervision

Madadnia, J; Koosha, H, & Mckenzie, J.  
*University of Technology, Sydney (UTS),*

**ABSTRACT:** The paper outlines an approach to research supervision based on collaborative partnership with and between research students in both face-to-face and virtual learning environments. The approach uses collaborative team-based approaches to encourage transparency and students' active participation and inclusion in developing common goals and making decisions, leading to quality research process and outcomes. Collaborative decisions are made about planning, methodology, interpretation, and presentation of research outcomes. Information and communication technologies and online learning environments are used to foster and enhance communication and co-creation between participants whether on campus or at a distance. The approach intends to assist students to produce high quality postgraduate research as well as promoting broader research education outcomes such as the capacity for lifelong learning, critically reflective practice, research project management and teamwork.

The paper reports on the authors' experiences of two different forms of partnership with research students and makes suggestions for supervisors and students working within a collaborative partnership model. It was noticed that virtual supervision works more effectively when students are aware of the potentials and limitations of the virtual environment, and when supervisors prepare students to actively engage in the partnership process.

### **INTRODUCTION: The Need For A Different Approach To Supervision**

The last decade of twenty century has seen dramatic change in Higher Education, which has necessitated, among other matters, flexible global education, and closer collaboration and partnership between educators, learners and industry (Madadnia and Koosha (2000)). Postgraduate research education is no exception. The recent Australian Government White Paper "Knowledge and Innovation: A policy statement on research and research training". [DETYA, 1999a; 1999b] creates a context in which research students will be expected to complete their degrees more quickly and graduate with a wider range of research capabilities which make them more entrepreneurial and responsive to industry needs. There is an implicit aim to change the culture of research supervision across the university sector.

The traditional model of supervision common in Australia and the UK is based strongly on the relationship between an individual student and

their supervisor, sometimes with the addition of a co-supervisor or supervisory panel. This model is increasingly being challenged. For many new postgraduate students, this model creates difficulties including defining their relationships with staff, isolation, identification of available resources, and uncertainty over expectations (Johnston 1999). Regular meetings between supervisors and students and closer management of projects have been recommended to reduce these problems and achieve shorter completion times (Seagram *et al*, 1998; Woodward, 1993).

For supervisors, the supervisory relationship has been characterized as striking a delicate balance between dominating the student's research by providing too much guidance and neglecting it by assuming too much autonomy on the part of the student (Delamont *et al*, 1998). While this balance can be successfully achieved at different times and with different students, dissatisfaction with supervision often seems to stem from approaches at one end or the other. At one end of

the spectrum, the assumption is of the autonomous student whose task it is to complete their research project and emerge as a scholar (Johnson *et al.*, 2000). Isolation and slow completion times are possible outcomes. At the other end, domination of the student's research may be more likely within larger funded projects, common in Engineering, where postgraduate students work under close supervision on a project which is more or less defined in advance of the student's arrival. Students in this situation may complete more quickly but fail to develop the range of independent research skills demanded by the government and industry. There is a risk of the balance shifting further towards this supervisor domination as increasing emphasis is placed on industry-funded projects and short completion times.

#### **AN ALTERNATIVE APPROACH BASED ON COLLABORATIVE TEAM PARTNERSHIP IN A VIRTUAL ENVIRONMENT**

Existing single-supervisor models have been challenged with proposals for different approaches to better meet the needs of students and industry. In practice, many students, especially in science-based disciplines like Engineering, seek advice from a wide range of people including post-docs, other postgraduate students, technical staff and other academics (Cullen *et al.*, 1994). Group-based approaches offer more explicit and broader forms of support for students, including fostering an environment for reflection and discussion in informal gatherings, seminars, conferences, panel supervision, and peer groups (Johnston 1999). One form of this is the collaborative cohort model Burnett (1999) which involves regular student cohort meetings (face-to-face or by teleconference), written progress reports and feedback. The role of the supervisor is to coordinate and mentor the research process. This paper outlines an alternative collaborative team learning model of supervision and shares the first author's experiences of implementing this model in a virtual learning context. The model means transparency, student inclusion, and partnership in decision-making processes between groups of research students and their supervisors. Table 1 compares the potential of this model with the characteristics, benefits and downsides of two

different paradigms which operate within the single supervisor model.

The collaborative team partnership approach includes two important dimensions. The first is the intention to develop a common goal with the shared understandings and a common language. The second is participative decision-making. The model is based on supervisors as a team leader, researching with their research students in the context of collective projects. The partnership between supervisors and research students follows the traditional team working stages, namely *forming, storming, norming, and performing*, to establish a balance between freedom and intervention. Interactions between students at different stages of their research cover the exchange of practices (know how, strategies) and critical reflection and present research networking as an important means for professional development.

While informal collaborative approaches have sometimes evolved naturally in projects where groups of researchers and students are working together in laboratory settings, there are now demands for more flexible and open approaches to postgraduate study (Pearson and Ford, 1997). Web-enabled interactive course management tools and other new technologies afford new possibilities for supervision, particularly for distance students or those working in industry-based settings. Dinham and Scott (1999) suggested that using ICTs to facilitate communication in supervision could improve both research quality, and student submission rates. In these environments, collaborative team research is unlikely to occur incidentally but needs to be explicitly fostered. In this paper, the term collaborative virtual supervision is defined to mean the use of information and communication technology (ICT) supported interactive and reflective activities among students and supervisors, focused on the improved realization of a research project.

Collaborative virtual supervision uses the capability of the internet for global communication, and both synchronized and non-synchronized interactions in a planned way to facilitate a range of forms of interaction between members of the research team. Students are given access to an interactive learning

environment in which they can interact with peers and supervisors, and are given opportunities to lead a project, experiment and reflect. The next sections of this paper describe two different experiences with collaborative virtual supervision and draw out the lessons learned for students and supervisors.

## **HOW DOES COLLABORATIVE VIRTUAL SUPERVISION WORK: TWO EXAMPLES**

### **Example 1: Collaborative PhD supervision at a distance**

While on sabbatical in the US, the first author collaborated with his PhD student and a co-supervisor at UTS using a team-based approach afforded by a range of ICTs. One of the aims was to maintain continuity of supervision for the student while another was to create an effective approach for remote research supervision where face-to-face meetings between students researchers and supervisors were not possible. The virtual team-work approach was used with the aim of improving the quality and quantity of research by all participants. This involved several components. Firstly, the UTS PhD student exchanged test results, figures, graphs, digitized picture, and texts with the supervisor and co-supervisor using email. Secondly, the author modeled his own research approach by communicating his daily research plans, methods, and outcomes from a parallel research project in the US. The author adopted a transparent and inclusive policy, and shared all the e-discussions and the communications between the two teams, the PhD team at UTS and the research team at the sabbatical site. The process was evaluated using analysis of the online discussions and exchanges and the supervisors' reflections. The frequency of interactions, and quality of discussion between the student and supervisors improved significantly compared with the once a week face-to-face meeting.

### **Example 2: Collaborative virtual supervision of student project teams**

The first and second authors have jointly supervised several student project teams online using the virtual environment afforded by the web-based systems "TopClass" and "Blackboard". The virtual team members meet only through internet. Therefore students were encouraged and motivated to communicate

electronically. The authors adopted an inclusive and transparent attitude, providing an informal relaxed virtual environment where students' anxieties and concerns could be articulated, collective solutions were encouraged and followed, and individual researchers could express their ideas and be listened to. Topclass and Blackboard provided a more effective means of discussion than email, and also enabled the creation of a documented record of the evolution of the research work which can be used for critical reflection and publications. The process was evaluated using students' weekly reflections, emails, and peer assessments, and questionnaire surveys. These were analyzed to obtain student perceptions of virtual supervision and team learning and establishing links with their research learning.

The evaluation suggested two conditions that contributed to effective collaborative virtual research supervision in this environment:

- The transparent and inclusive attitude which aimed to develop a shared understanding of the project, task and process between supervisors and students. Transparency was encouraged initially by the supervisors, who published student criticisms of the team approach in an online forum and invited further responses. The supervisors responded with changes to the approach which were also discussed online. Students reported that this transparency reduced their anxiety and built confidence in their ability to carry out their research projects.
- Regular feedback from peers and supervisors which is facilitated by a shared online forum where students can see the feedback given to others and participate in the process.

## **LESSONS LEARNED**

A number of lessons were learned by the authors through engaging in these initial examples of collaborative virtual supervision. While Burnett (1999) describes a collaborative model which involves face-to-face contact, this is not necessarily the case with virtual supervision. In both of the above examples it was noticed that the absence of non-verbal communication created some misunderstandings and difficulties for ongoing student engagement and motivation. One way of addressing this was to engage the students in role playing, for example through

rotating the “supervisor” role among research students for weekly online meetings. The second method was through organizing a virtual team where all roles were carefully defined in relation to the team members: supervisor, senior research student, new researcher and similar roles. More experienced students played supervisory roles for newer researchers. Role-playing enhanced creativity and motivation and encouraged the development of life-long learning skills. The authors also took on the public role of research learners, modelling the real-life processes of research, by exposing their own current research issues, problems and questions in the online forums for student discussion and comment. The intention was to facilitate and to promote research learning using pedagogy embedded in real life situations, which makes researchers more open minded, agile, tolerant of different approaches and views, more ready to grasp changes and opportunities in a virtual learning environment.

To encourage students to understand and see the value of the collaborative and role playing approaches, the authors used the metaphor of the blind person and the elephant, where each student doing their own individual project was able to experience only one part of the “elephant”, while role-playing, shared communication and feedback in the group enabled them to experience the nature of research from different perspectives.

In virtual supervision, particular attention must be paid to the process and the conditions of effective collaborative learning and decision making. Research group members should ensure that they recognize the need to create an informal, respectful, mutually stimulating environment and that each considers not only what they can gain from the group but also what they can put into it. If this is achieved, supervision in a collaborative virtual environment can help students to negotiate among themselves and make decisions in proposing, planning and interpreting, and finally communicating their results. The virtual environment makes supervisors’ and peers’ comments visible, assuring students that their views are reviewed all the way through the project. It should be also realized that new researchers, and students who appear to have lower self-esteem, live with more anxiety and have difficulties in communication and participation in decision making especially on line. Transparent expectations and positive feedback need to be consistently communicated

to encourage all team members to participate. There also need to be options for students, particularly at the beginning, to communicate privately with supervisors by email and have their need for private communication respected.

Student and supervisor expectations need to be more explicitly negotiated in the virtual environment, regardless of whether a collaborative approach is used. Factors which need negotiation could include: common interests, benefits, and skills of individual researchers, developing a common quality standards for work done, and expected skills developments, IP, ownership, commitments, timeframe for presenting results, external factors dictated by grant-bodies, university, and industry. Supervisory roles which need to be more explicit include the following levels: operational (practically conducting research with student), tactical (allocating research funding, equipment, and research facilities), and strategic (identifying research topics and objectives, developing research plans and methodology, and interpretation and presentation of results). The collaborative virtual environment has the benefit of making supervisor-student expectations public, so that new students can learn from the experiences of both supervisors and other students.

From a research training perspective, collaborative virtual supervision also has the benefits of giving research students a specific experience in working through a collaborative task and this helps them to understand their project deeply and build the required confidence and project management skills to deal with a project effectively. Collaborative virtual supervisors can encourage students to share their ideas, reflect on their learning and research findings and receive feedback from both peers and their supervisors. In our examples, students found that the virtual environment and communication with other students and supervisors provided opportunities to improve their reflections and deepen their understanding. The research group may be valuable in helping research students to manage their time and achieve the transition from PhD to publication and becoming an independent researcher. Setting clear goals for scholarly activity through negotiating objectives with research group members and jointly developing a ‘performance

plan' or 'creativity contract' are some of the advantages of team research [Ramsden 1998, p 187 ], Supervisors also can benefit from this shared approach. As Gmelch and Miskin (1995, p.46) note, " Faculty perform better when they have the opportunity to observe others being productive".

## CONCLUSION

New supervisor-student relationships need to be developed with substantial changes in the nature of traditional engineering practices of teaching and research. The collaborative virtual approach implies different interests, different modes of control, and different patterns of communication between supervisors and students and criticizes the traditional model of 'the lecturer' versus 'the students', 'the supervisor' versus 'research students', and 'them' versus 'us'. The new practice reflects values, which are sustainable and need to be promoted on every front, in classrooms, in research environments, and by the community. The authors regard themselves as researchers and learners in a virtual community involving supervisors and students. New knowledge on developing effective virtual supervision is one visible result of the work of this virtual community.

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Table 1 Organizational paradigms for research students supervision

Definition	Paradigm 1 The autonomous student	Paradigm 2 Managerial supervision	Paradigm 3 Team partnership
Emphasis on	Student autonomy	Supervisor control	Collaborative partnership. Supervisor as a more experienced partner.
Attitude & character	Conservative and inflexible	Set rules/ or rule follower	Agile, risk taker and experimental
Mode of interaction	Non-interventionist, academic freedom predominant.	Tactical or strategic managing role, tight control over students (intervention in decisions made)	Coordinator, partner, creator and innovator with varying roles determined by problem encountered; but all decisions made in discussion with students.
Decision making	Decision making by students who are expected to learn from their mistakes.	Decision imposed by supervisor and justified on efficiency grounds (I know best)	Decision made jointly by compromise and appeal to common needs, freedom and control in creative tension. Emphasis on testing ideas against demonstrated criteria and outcomes
Role of Conflict	Conflict as students assert their ideas: may be productive	Conflict restricted: seen as destructive	Conflict (e.g. the <i>storming stage</i> of team working) viewed as necessary and comparatively comfortable.
Goals	Goals are exploratory and evolve over time	Short term operational goals, reliance on algorithms	Long-term big picture based on broad principles of problem solving, and system thinking approaches.
Adoptiveness	Slow learning and adaptation	Reactive learning and adaptation	Proactive-fast learning and adaptation.
Potential benefits	Opportunity for students to pursue their own ideas	Fast results-e.g. in industry-based projects	Research training-development of students' professional and personal attributes. Student access to a broader range of learning and support opportunities
Potential risks	Student neglect/slower completion times	Domination/Lack of development of student as independent researcher	Often need to change students' expectations of supervision. Need to be sensitive to power inequalities between student and supervisor team members and the effects of these on team interactions.

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