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Research Supervision: Process and Experience

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ABSTRACT

This paper describes the research and supervision processes involved in the Master of Computing programme at UNITEC, beginning with the research methods course and the official approval processes, and leading to the completion of a dissertation or thesis. The authors discuss the challenges and experiences of the first two years of supervising dissertations and theses.

Keywords

Research, supervision, dissertations, theses

1. INTRODUCTION

UNITEC's Master of Computing requires students to complete a dissertation or thesis, as well as course work. In this paper, four of the supervisors (who supervise 35 of the students) reflect on their experience as supervisors. They review the lead-in provided by the research methods course, describe UNITEC processes for approving proposals (including supervisors and ethics), reporting progress and appointing examiners, and discuss some of the challenges and rewards of research supervision, both face-to-face and at a distance.

2. BACKGROUND

UNITEC's Master of Computing has been running since February 2000 and consists of either 180 credits of course work and a 60 credit dissertation or 120 credits of course work and a 120 credit thesis. Two students completed their dissertations in 2002, and currently more than 60 students are at different stages: writing their research proposals, obtaining ethics approvals, gathering and/or analysing data, writing first/second/third/… drafts, awaiting the examiners' reports. These students are located in Auckland, Hamilton, Palmerston North, Otaki, Wellington, Taiwan, Germany and Norway. Each student has a principal supervisor and an associate supervisor.

Of the twelve supervisors, eight are staff from the School of Computing and Information Technology (SCIT), and the other four are professors from elsewhere: one each from UNITEC's Centre for Innovation and Entrepreneurship, the Chinese University of Hong Kong, the University of Melbourne, and Tech de Monterrey in Mexico. The supervisors range from very experienced to novice and are approved by UNITEC's Graduate School. The Graduate School also approves the students' research proposals and supports students and supervisors by providing advice, a supervision code and workshops.

3. RESEARCH METHODS COURSE

The Research Methods course in the Masters of Computing programme provides the training, groundwork and philosophy of research. The depth of understanding gained by students about the whole

research process, ethical considerations and official UNITEC requirements, as well as individual research methods provides invaluable preparation for dissertation and thesis. The supervision process for all supervisors is facilitated when students are well grounded in all elements of the research process.

Research Methods provides a framework for applied research through examining research methods and preparing research proposals in the following information technology areas: enterprise networks, instructional design, interactive multimedia and the internet. Students are given the opportunity to develop the following skills: conceptual thinking, analysis and evaluation, planning and synthesis of knowledge.

Once students have completed the Research Methods course they are able to:

- ♦ establish the basic requirements for research
- ♦ select, analyse, critique and synthesize literature/ information pertaining to a potential research topic
- ♦ identify and apply methods for formulating solution procedures and construct a draft research proposal
- ♦ experiment with the various techniques used for analysing quantitative and qualitative observations to establish their appropriateness and limitations
- ♦ use a critique of other proposals to improve their initial draft research proposal
- ♦ determine the content and appropriate style of presentation together with the tools used for presenting results.

Students are also provided with the opportunity to learn about the supervision process through individual supervisor meetings during the course when the research proposal assignment is being planned. At this supervisor meeting with the Research Methods course coordinator, students are guided through the steps required to complete a research proposal. This meeting also prepares students for supervisor meetings when they are enrolled in the following dissertation/ thesis course.

Experience gained from running the Research Methods course four times (three times in Auckland, once in Wellington) shows that this preparation is essential for students to continue onto thesis or dissertation. Students exit from Research Methods with a much clearer notion of what is required for the research area, scope, research method, literature review, ethical considerations, and social and technical requirements. Having completed an assignment in which they are required to present a generic research proposal, it is usually just a translation exercise from their course work proposal to a research proposal to meet the requirements of UNITEC's graduate school academic committee (GSAC). A generic research proposal is required in the Research Methods course because this equips the students with skills beyond GSAC's specific requirements.

4. THE OFFICIAL PROCESSES

GSAC's research proposal form has seven main sections:

- ♦ general information (topic, student name, qualifications and experience, supervisors)
- ♦ description of research
- ♦ aims and objectives
- ♦ comments of supervisors and head of school
- ♦ supervision contract
- ♦ literature review
- ♦ methodology

The supervision contract requires the student and supervisors to "agree to abide by the responsibilities contained in the Code for Supervision of Postgraduate Students Undertaking Research, the Policy on Publications, the Policy on Proofreading and Editing, and the Policy on Intellectual Property." The supervision code "is written in the belief that there is a reciprocal relationship and mutual accountability in supervision, and with respect for individual autonomy and the pursuit of knowledge". The code identifies 16 responsibilities for supervisors and 10 for students. It also has sections covering Selection of Supervisors, Unavailability of Supervisors, Mediation and Unsatisfactory Progress (UNITEC, 1997).

Within the school the student's research proposal is reviewed by the programme director and at least one supervisor, who usually suggest clarifications and improvements, before it is submitted to GSAC. The programme director presents the proposal to a GSAC panel consisting of the dean and two other programme directors, who usually suggest clarifications and improvements and always require ethical approval.

All ethical approvals used to be handled by UNITEC's Research Ethics Committee (UREC), who followed a complicated and rigorous process, using a 7 page form that included sections covering cultural issues and use of human remains, tissues or body fluids. The completed form was considered by committee members who knew little about research in computing. Consideration of ethics forms often

involved the minutiae of such things as the layout and wording of consent forms and questionnaires ("the logo is too small", "there should be bigger spaces between questions") and the storage and disposal of responses ("how will the filing cabinet be locked?").

One student spent six months trying to satisfy a succession of UREC requirements for research into the use of multimedia by children with disabilities. Discouraged, he chose a different topic (the use of pen-based computers in healthcare) and then had to obtain separate approvals from three district health boards and a school of nursing! Meanwhile the programme director and research coordinator applied for and were given delegated responsibility for ethics approvals. We still take a rigorous approach to ethics approvals, but now the focus is on ethical principals, rather than unimportant details.

Once the proposal is approved, students work with supervisors and are required to provide monthly progress reports to the programme director. These are used to balance supervision loads, identify possible problems and make timely arrangements for examination. GSAC appoints two examiners (one external and the other internal) on the recommendation of the programme director, and asks for reports to be returned within six weeks. The dean is responsible for recommending a final grade to GSAC (sometimes after negotiating with the examiners, or appointing a third examiner).

5. THE RESEARCH PROCESS

The postgraduate research process is compressed into key elements each of which is briefly described below.

5.1 Contexts

Research is carried out within a discipline, a philosophical perspective, a cultural context, and a particular ethos (the personal position of the researcher, in a role, in a nation).

5.2 Research Question

A difficult early task for students is identifying a research question that gets to the heart of the proposed research and permits a positive or negative outcome.

5.3 Structure

The structure of the research outcome could take one of many forms among which are: a chronology, a Journal article. A common format for presenting material is captured in the acronym IMRAD (introduction, methods, results, analysis, discussion). The introduction describes the contexts. It states the research problem and should include an examination of the literature, trenchant critique of prior work and identification of work needing done. A methods chapter would describe the specific steps taken to solve the problem. The actual data or material collected by applying the method would be present in a separate results chapter. The outcome of close and careful examinations of the data would be presented in the analysis chapter. A final section or chapter would interpret the analysis of the data in relation to the research question and discuss the implications of the research. Conclusions drawn from the research and work yet to be carried out make up the last parts of the final chapter.

5.4 Supervisor's Roles

The goal of postgraduate research education is to develop independent learners in an academic environment. The supervisor should be interested in promoting independence of thought by carefully challenging, discussing, debating, extending, scheduling, relinquishing control and giving credit where credit is due. A crucial role is helping the student select an appropriate range of activities during the research process (Phillips and Pugh, 2000).

5.5 Student Roles

The student should meet the supervisor(s) regularly to exchange copies of reference material and be prepared for every meeting by having completed agreed tasks, thus contributing to at least half to the conversation in supervision meetings. The student should keep a diary of questions/answers that occur during the research experience.

5.6 Reflections

I find the supervision process both challenging and rewarding. It is challenging because the students bring experience and potential to the research that is, as yet, unproven. In completing research students justify all the decisions in the past that they could benefit from further education. The challenge lies in helping the student identify, plan and complete work in a way that is acceptable in the academic world. I find challenge too, in the ever-moving goalposts of research thesis quality.

I find reward in the moments of serendipity that occur when students bring half formed ideas to which I can add a slightly different perspective out of which comes a dissertation or thesis topic. Probably the single most rewarding aspect of supervising students occurs when each student brings me a black bound

gold lettered book and says, “I have finished, here is your copy of my work”.

6. A NOVICE SUPERVISOR’S VIEWPOINT

After 20 years in industry, the thought of becoming institutionalised at a university was a bit daunting, so I gave my new job at UNITEC a year to see how it went, keeping my own business alive as a backstop. Enjoying projects and the cut and thrust of making things happen in the commercial world, I had almost decided that after one year of boring academia I would be looking for something new (having been happy with the experience though of the academic interlude). How wrong I was.

The world of research opened before me after having a paper accepted at NACCQ, then later some papers accepted at international conferences. The stimulation and thought-provoking work others were doing engulfed and ignited my own life interests and provided a pathway to develop and share my own work into something applicable and replicable in a way that reaches far more people than a single commercial project.

Supervising masters dissertations is an enlightening process. Being involved with young (and some not so young), bright, eager minds in the pursuit of bigger and better things is a privilege and the learning is in both directions. On reflection though, the involvement in the masters program could equally have been a cold and isolating one. Being the odd one out of the four main supervisors, the others having doctorates and many years academic experience, my experience could have been one of isolation and incompetence. Instead it has been one of the most rewarding experiences I have had and one that has prompted me to pursue my own doctorate in a field very close to my heart. So what is it that has made me feel so rewarded in this work?

The structure and management of the programme has helped my transition and contribution enormously, but more than this was the culture and philosophy in the school. There was (and is) a healthy team spirit, active collaboration and communication, with each person taking the time to stop and consider their colleges. There was open recognition of my contribution to the team and the facility, and gentle nudges to help me cover my weak points. This was not a one-off event but an ongoing process that the other supervisors are all participating in and supporting, thus creating a very collegial approach.

I discovered that academia is no different to any other business I have been involved in, and that the underlying culture of the organisation and philosophies of the people in the team are what ultimately makes the difference for staff and students alike. Ultimately we are here for our customers and the spirit of collaboration, support and recognition make their experiences positive as well as ours.

7. CONCLUSION

A supervision relationship is a formal academic conversation carried out over an extended period of time between at least two people. Supervision outcomes are characterised by error-free outputs following the accepted form in a particular discipline. For the student there should be growth of independent learning skills. For the discipline there should be contributions to knowledge.

Most institutions offering postgraduate programmes will have structures, processes and guidelines for supervised research similar to those described in this paper. Students and supervisors may sometimes find them burdensome, but they do provide a framework for novice researchers to conduct worthwhile research and supervisors to extend their knowledge and skills.

REFERENCES

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