

# **Professional Doctorate Taught Courses: Some Metaknowledge and Intellectual Property Implications**

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## **Abstract**

Professional doctorate candidates engage in discipline specific investigations linking practical questions with current developments and creating new knowledge in computing and information technology as an outcome. Course content and a constructivist pedagogy is described and exemplified for a professional doctorate in computing and information technology in New Zealand. Both academic and student responses to the program are described. Problems and points of tension are identified, and solutions discussed.

## **Introduction**

Doctoral study is reported in the literature (Phillips & Pugh, 2000) as often being a period of isolation characterised by high failure rates, damaged personal relationships and wasted effort. Seen as part of the larger experience of human transformative processes such outcomes may have been implicit in the past but are no longer a necessary aspect today. There has been a global trend in tertiary education towards exploring ways to reduce the bad outcomes from doctoral study and increase the positive outcomes by engaging more closely with 'industry' during doctoral study. Green et al., (2001) provide a useful summary of recent developments in the field of doctoral studies. While their central focus is on Australasia, the contextual summary includes snapshots of developments in other regions.

In this paper, some issues associated with taught course pedagogy are raised first. The courses are briefly described in relation to course content and the pedagogy used to engage students in scoping their research interests and investigating the literature. Next, issues related to intellectual property of industry engaged professional doctorate students are raised. The discussion suggests that existing legal mechanisms may be adopted to support student practice-based research through to the point of submission and publication of theses or papers. Finally, students' views of their experience in the professional doctorate taught courses are reported in their own words.

## The Taught Courses

Taught course professional doctorates are one strategy for addressing some of the issues that plague doctoral completions. Three elements of the strategy that are seen as essential for the success of the program are high entry standards, a collaborative learning environment and success in the preparatory papers. The first element is the entry requirement of competence in a profession directly related to the proposed area of study. Competence in a profession means that the doctoral candidate has developed a work ethic and has a practice-grounded basis from which to build a proposal for research. The entry standard includes evidence of research based study at master's level, evidence of publication in the focus discipline or in a reference discipline (for Information Technology (IT) reference disciplines see Avison, D. & Jan Pries-Heje, 2004) or an honours degree that includes a research project. The second element is the involvement with a group of peers undertaking a similar course of study. The careful induction of students through the early stages of the doctoral process ensures, by group participation, the collective supervision and progressive narrowing of focus that can arise when people work under close collegial observation. The third element is the satisfactory completion of the three taught courses as an entry requirement for continuing on to research for the thesis.

This paper takes the guidelines in the formal documentation and indicates how the course descriptions have been fitted to the pragmatics of tertiary teaching.

In essence, the program of study is supported by three taught papers, 1001 (Critical Issues in Professional Practice), 1002 (Research Development) and 1003 (Scholarly Enquiry). On completion of the papers students would engage in research reporting it in a thesis (1004) with the examiners expectation that the reported research would make an original contribution to knowledge while informing professional practice. Taught courses make up one third of the doctoral program while the thesis makes up the other two thirds. Outputs from the taught course include formal oral presentations, two for 1001 and one each for 1002 and 1003. For each of the taught courses there is also a requirement to produce written outputs of publishable quality. The content of the courses is briefly described in the next section.

1001 Critical Issues in Professional Practice aims to 'allow participants to explore a breadth of theoretical issues in their profession'.

1002 Research Development has the aim of: 'enabling participants to develop a critical understanding of research in their field and advance their professional research capabilities'.

1003 Advanced Scholarly Inquiry has the aim of 'allowing participants to engage with the literature/information relevant to their research topics'.

### **Constructivist Framework**

The taught courses 1002m and 1003 adopted Von Glasersfeld's (1995) position on learning. "From the constructivist perspective, learning is not a stimulus-response phenomenon. It requires self-regulation and the building of conceptual structures through reflection and

abstraction..." (p.14). Making up the constructivist framework were a number of fundamental concepts listed below:

- People in the workplace are entitled to life-long formal learning opportunities, irrespective of differences in personal attributes and personal circumstances.
- Participants should be at the centre of, and involved at every stage of the teaching and learning experiences including task scheduling and the assessment processes.
- Individuals can and do learn in different ways, at different paces and report their learning in different ways using different media, through the language of a particular discipline.
- Participants should be able to acquire the knowledge and skills that are relevant to their day-to-day lives and to their aspirations for the future.
- People should always be able to choose among a range of experiences in which to participate so that their choices build on and extend prior learning.
- People learn best when there is something they see as being important to learn and it is something they really want to learn.
- Learning should build on each person's existing strengths.
- Learning should help to increase a person's quality of life, by contributing to improved choices and autonomous decision making.
- Learning should be viewed as rewarding and enjoyable in the long term.
- Higher learning in the professional doctorate program:
  - Involves collaborative engagement with peers in a group context.
  - involves engagement with the relevant literature reporting the state of a field at the levels of philosophy, theory, methodology and practice.
  - involves a personal transformation process during which fundamental issues and controversies in a discipline(s) are encountered, considered, critiqued and reflected upon.
  - involves identification of, engagement in and evaluation of potential change(s) in professional knowledge that may directly alter practice.
  - involves communicating (using appropriate media, artefacts and technologies of the discipline(s)) about the process and outcomes of a research process in a publishable form.

A constructivist approach to learning in group sessions meant:

- the learning situation is organised so that participants were exposed to different perspectives in a research focussed context.
- discussions were focussed by providing specific questions; by raising a controversial problem in context; or by asking participants to choose prepared resources relevant to specific topics.
- time was limited so participants interacted in a circle where each member of the group had same-room eye contact with every other group member.

### **Practicalities for 2004 Cohort in 1002 and 1003**

There were five students involved in the program in 2004. One changed employment and left the program as a result of a change in aspirations. The remaining participants are fully

employed information technology professionals who are undertaking the professional doctorate program on top of work, family and other commitments. Each person has a distinctive focus within the overall context of information systems as a discipline. One student manages the IT for a small-medium retail enterprise (SME). A second student is a professional electronics engineer seeking to apply career length experience to investigate safe IT environments. Another student worked in an industrial setting building plant maintenance systems. The last student is a documentation expert seeking to apply semiotic analyses to project failure issues. Based on my observation of, and participation in, last year's Contemporary Issues in Professional Practice course, and this year's taught courses, students are advancing in their studies at various rates. Characteristically, students make significant progress over short periods but have longer periods, reflecting work and other commitments, where progress is slower.

The weekend sessions are intended to provide the focus that, by setting preparation and follow-up work, facilitates students' continued forward progress with the development of the knowledge, skills, attitudes and abilities required for doctoral research in a professional context.

### **Pedagogical Issues**

Gaining a critical understanding of research in a field requires that participants identify the assumptions that inform the discipline; ask where these assumptions originate, what evidence exists for their validity and accuracy, and how well the academic constructs fit the different contexts in which people work. I have found critical analysis to be most effective when people review their assumptions through the different theoretical and experiential lenses that a collaborative group setting makes possible. Establishing the prerequisites for shared communication presents a number of questions and challenges. The fundamental question that must be addressed in preparing students to undertake a professional doctorate in a group context is what approach to take to ensure the successful participation and completion of a program of advanced study. It is clearly not possible to provide the discipline specific background for each of four or five individuals so that they understand in any detail all the essential aspects of each group member's respective research interests, both academic and professional. The brief description of the students' research interests mentioned above shows that a more disparate group would be difficult to imagine within a single disciplinary context. Information Technology, as it increasingly interpenetrates other disciplines finds academics with particular discipline specific interests in what information technologies will do for their research. As will be evident in subsequent sections the solution adopted in this program was to raise the level of interaction in early sessions to that of meta issues, to what it is to engage in research, to different types of research questions and associated methods and consideration of research from a number of difference perspectives. Students are unlikely to be able to grasp all the finer points of departure of the particular research area of one member of the group, but they were able to bring to discussions those aspects that were recognisably common at the meta level in their work. Among these shared areas was a focus on the application of computing technology tools to information systems in social settings. They shared a common concern with recent developments in the disciplines. They needed to know about the nature of academic disciplines and the processes that legitimate knowledge. They needed to know about literatures and how to evaluate previous research. They needed to know about the form and substance of different types of academic writing.

Students are treated as colleagues and adult learners who bring valuable experiences to the study setting and who have the ability and responsibility to participate actively in shaping the experiences of participants in the course. Students are expected to prepare material communicated to them via email by the supervisor before weekend sessions. Draft material is often sent by students to the supervisor for reading and comment, a process that will become more intensive as these documents near completion. Students are expected to engage in the activities during the weekend and one-to-one sessions. The weekend sessions worked out in practice as a series of integrated workshops around the topics described in the next section. Typically, sessions were an hour long with about twenty minutes devoted to prepared consideration of a topic followed by twenty minutes of questions, and time for discussion and reflection. The approach adopted for 1002 and 1003 is organised around on a combination of weekend literature and workshop based sessions and individual weekly meetings for providing supervisory support. Not all students attend individual weekly sessions as personal circumstances and work commitments make the logistics of attending ‘during the working week’ meetings difficult.

The next session lists the indicative content the topics covered.

### **2004 Semester One Topics**

March 6-7 Introduction, the nature of research, approaches and perspectives, and the role of literature in academic disciplines.

April 3-4 How literature reflects change in disciplines and practice. Epistemology and ontology: positions and consequences in research. Methods and approaches, tools and techniques.

May 8-9 Qualitative and Quantitative approaches. Nature of IS research, Concepts in IS research. Philosophy of IS. IS Research Questions in theory and practice.

June 12-13 Computer Science developments and research issues.

### **2004 Semester Two Topics**

July 3-4 A range of research questions and possible approaches developed from these. The elements of reporting research. The contribution of change within discipline specific research processes.

August 7-8 Presentation and critique of draft literature reviewed for a professional problem area. Presentation and critique of prepared draft literature review for publication.

Sept. 4-5 Distinguishing academic from professional and business research.

Oct 9-10 Presentation and critique of research proposals including research approaches.

Prior to each session, outlines of workshops themes and preparatory work were provided via email. Three session outlines are reproduced below to indicate the flavour of the preparation required of participants.

#### **Session One Outline**

Research Development and Advanced Scholarly Enquiry.

Session Outline and tasks.

Please bring:

- 10 concepts (and definitions) drawn from your area of interest with you to the first session. You should be able to show how the concepts relate to a major theme and each other. Have these prepared on paper for distribution, five copies please.
- Please bring five research questions about your research interest together with how you think you would go about answering those questions. Have these ready on OHP transparencies.
- Locate five examples drawn from different Journals of articles that employ methods that you could use. Choose from papers that were published either in 2002, 2003 or 2004. Each paper should reflect a different aspect of the research area you are interested in and employ different methods. For each paper identify: the question(s) being asked, the type of method used, the type of data collected, the outcome of the research reported. Identify any suggestions of further work in the papers.
- Select any two contrasting methods and be prepared to defend their use in relation to the five research questions you have chosen.
- Find definitions for the following terms and consider how they might be applied to your research area.
  - positivist research
  - interpretive research
  - critical research
  - post modern research

#### Session Two Outline

- Start of your annotated bibliography. between 10 and 12 (at least) papers related to your area of interest.
- Select two of these and make copies (6) of them for distribution.
- The papers would be expected to represent the typical type of research methods adopted by workers in your area.
- Begin the process of identifying collaborators and centres of research in your area. You should be able to identify several key centres of active research.
- Identify key personalities in the original and current research.
- Identify the Journal you would like to publish your lit review in.
- Bring along copies (6) of a paper from the Journal you would like to write for that outline/review an area of literature, not necessarily in your area.
- Bring along the Journal editor's guidelines to authors.

Session topics on the day.

Literature:

- Present your selected papers for discussion.
- Present your Journal editor's guidelines for discussion.
- Make sure your Journal is different from the other course participants.
- Email to each other to check.
- Review (read and think about) Lamont Johnson's Meaning and Speech Act Theory.
- Review (read and think about) Jack Copeland's Four Concepts Paper.
- Review (you know what to do) Floridi's paper What is the philosophy of information?

- Be prepared to critique each paper. Evaluate the paper in the context of practice in your discipline.
- Be prepared to comment on the relationship between the papers and your research area.
- One hour will be set aside each day for supported literature search on the ACM portal.
- One hour video segment (advanced graphics tools) and discussion during working lunch.
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### Research Methods

(four sessions in total)

- Survey of research problems from a variety of perspectives
- Survey of research questions
- Survey of research methods in relation to particular research questions
- Matching problems/questions/methods/data/presentation and analysis tools

### Session 5 Outline

Paradigms and progress at the research frontier

- We have material on the way Sciences develop. You should have read all of the paper on Kuhn's book. We will work through the summary material chapter by chapter. I will take chapter one. Perhaps each of you would like to take chapter to talk about?
- We need to arrive at some assessment as to where developments in your particular research area fit into Kuhn's ideas.
- At the end of these sessions you should have a good idea as to where what you are proposing fits Kuhn's scheme of things and be able to provide support for your ideas from your references.
- We will spend Saturday doing this.
- We have material suggesting ways in which Computer Science and Information Systems could develop. We need to identify reference disciplines for your research. We need to identify what areas are key to the reference disciplines.
- We need to link these areas with your research. We need to identify the different questions and methods used in your reference disciplines. We need to work through why particular methods are more appropriate for your research and what are the most appropriate methods for your research in a defensible way.
- We need to critique the papers in your annotated bibliography in relation to the reference disciplines to see where they are moving and to see where they might move in the future.
- At the end of Sunday you should be able to say where the gaps are in the reference disciplines and you should have a clear and defensible grasp of where your research fits into the greater scheme of things in your discipline.

The session outlines indicate that student are actively involved in preparing material for the sessions and are expected to take a central role in the activities during the sessions. Session activities take the form of workshops to expedite the collaborative learning. The main goal in promoting group based work is to 'enhance learning experiences of all members beyond what could be achieved through purely individual study'.

### **Metaknowledge Issues.**

Three metaknowledge issues, of the many that have arisen, have appeared in sharper focus during the workshop sessions. The first concerns the extent to which students needed to understand each other's work context and research focus. The second concerned the rules of engagement between researchers and practitioners in contexts where the research had more than just academic value. The third concerns the potentially conflicted claims on student intellectual property.

### A Collegial Approach

The topics in both 1002 and 1003 were organised in themes so that participants developed a sense of the research process in a way that enabled them to position their work within research in general and within their professional focus and reference disciplines. In every weekend session students were expected to prepare material about different aspects their research interests for presentation to the group. Such knowledge is above the concerns of an individual research project but helps provide a broader perspective from which it was hoped critical reflection would emerge as participants saw their work in relation to that of their fellow participants. Progress in that direction is reflected in participant's comments at the end of this paper. There has been a growing understanding of the complexity of intellectual property issues as the students considered their topics and their proposals were sharpened and moved closer to presentation.

### Intellectual Property Issues

Broadly speaking there are two main ways of viewing intellectual property. The first is that creative people should be encouraged to continue being creative by certain legal provisions that see direct benefit to creative individuals. The second is that intellectual property should be made widely available where it is to the benefit of society. The recent Trade Related Aspects of Intellectual Property (TRIPS) amendments have served to further commodify intellectual property in the form of creative work. On the surface, these changes seem to advantage the individual and to encourage more creative work. The output from academic research is creative work. Much academic research is speculative and has only potential value until proven in the market place. Traditionally, the road from idea to application to profit has been a long and slow one requiring substantial financial, managerial and other resources. The particular importance of research as intellectual property is considered in the next section .

### Intellectual Property when Engaged in Practice

Post-graduate student research is increasingly being promoted as requiring 'engaging in practice' in the wider sense of direct involvement with professionals in industry, business and commerce. Whereas, academic researchers in the past have deliberately advised students not to engage in commercially sensitive research, the professional doctorate places that engagement in the forefront of requirements for success. Most doctoral level research has the purpose of demonstrating competence in carrying out the research process in a discipline. The goal of the researcher was to demonstrate that competence in the form of a publicly available and academically acceptable thesis. However, for the professional doctoral candidate with a requirement that includes engaging in investigations that advance professional practice, the issues on what, and how much, of the new knowledge to disclose are fraught. For example, a student with a new idea that may have the potential to advance practice, may be under contractual obligations to an employer. Such obligations include protecting an idea that could be profitable

and at the same time could form the basis of a defensible advanced practice research thesis. The conflict of interest here is that the employer has a prior claim on the idea whereas the student has an obligation to contribute, through publication of a thesis, to the benefit of society in general. The same idea may be a point of commercial difference or provide a business competitive advantage. In a traditional doctoral program, students are advised that research that cannot be published because of commercial sensitivity should not be undertaken, since the point of research is, in large part, to publish research outcomes. It is publication recognition that is the means of indicating academic approval and also social contribution in advancing knowledge.

It is easy to see that advice suggesting traditional care with topic choice is in potential contradiction with the requirement to make an original contribution to professional knowledge and practice in their field. Such new knowledge, with respect to practice, would reasonably be assumed to have value, and potentially, monetary value. Among the suggested items that a professional doctorate candidate in Computing and Information Systems could consider are:

- computer based survey methods used by professional pollsters,
- a new computing invention for which a patent application has not yet been filed,
- marketing strategies for the use of information technology, assessments of the relative merits of software programs in specific contexts,
- computer based data collection,
- evaluations of the commercial claims of fitness for purpose of a software application,
- computing assisted manufacturing techniques and computer algorithms.

### **Intellectual Property Protections**

Some forms of protection are available to people in society who have new ideas. Among these forms of protection are copyright laws, patent protections, and trade secrecy provisions. We consider, in turn, the suitability of some forms of protection for people in professional doctoral programs. International copyright law provides protection to authors for the creative expression of ideas, but offers no protection for the ideas themselves. Placing copyright on the expression of a new idea could see it appearing in other literatures, correctly referenced, of course. Early release in a seminar or abstract could also result in self-pre-emption so that the author is subsequently unable to pursue other normal protections such as patent protection or is pre-empted from the protections of trade secrecy. Patent protection provides monopoly rights to the holder of the patent. Acquiring those rights may cost hundreds of thousands of dollars in legal and associated filing expenses. Expensive patent protections are unlikely to be available to a student and are only very rarely offered by an institution to an employee.

Trade secrecy provisions, including their legal vehicles, the confidentiality agreement or non-disclosure agreement (NDA), provide the type of legal mechanism that seems accessible and appropriate for the protection of student intellectual property from accidental release, for publicity purposes, or from deliberate theft prior to publication. In encouraging the adoption of such protections, the academic institution would be altering the traditional view of the rules of engagement in academic discourse. Those rules are that academic discourse was public discourse and that it was somehow separate from considerations other than the purely free exchange of information and argument. Such noble views are still held by mathematicians and to a certain

extent philosophers. Neither group of persons has found protection of intellectual property in the courts. Other disciplines have changed, and the nearer to practical matters the discipline is, the greater the change.

I would argue that the direct engagement in advanced study of doctoral students in professional practice has already substantially crossed that boundary in technology-based disciplines. The issue now is how to facilitate that process in a way that protects students' interests while still allowing the eventual outcomes of the research to find their way into the public domain when the thesis is published or the papers written. By adopting the NDA or some other confidentiality mechanism, academics would be applying the same protection measures employed by industry. Covering collective interests, particularly where students are, as is increasingly the case, also staff, seems an appropriately conservative position. There can be no downside to the duty of care adopted by supervisors and assessors of doctoral work when agreeing to sign a non-disclosure agreement for assessment purposes. It is also good business sense to promote respect for applied intellectual property.

The pressing issues of intellectual property are at the sharp point of daily experience for people in the computing industry since the core issues have not yet been completely worked through in the courts of law or in day-to-day practice (White, 1999). Among the central issues is the further question of where the rights to private property and the obligations to employers are distinguished in cases of dispute. It is common practice for academic institutions to claim rights over staff intellectual property not including academic publications. It is not yet clear how such claims will be extended to include the outcomes of professional practice based research where there is a contribution to the work from industry. It is also not clear whether claims made cover every aspect of an employee's intellectual property include whatever happens outside work hours. Such claims on academic's intellectual property are made in litigatable terms such as 'claims rights over the discoveries of employees made within the scope of their employment' but do not indicate whether employees have a 'life' outside work.

### Other Influences

It does, however, seem clear where the professional doctorate candidature is unencumbered by subsidy from the workplace, that intellectual property considerations are straightforward. The student is simply paying, in part through fees, for the learning experience. Students would own their intellectual property without encumbrance. Students, seeking help from their supervisors, would need to decide on the nature, extent and timing of disclosure through publication, an eventual goal. Where there is some subsidy in excess of normal expectations, either in the form of employer time or resources, matters are not so clear. Such situations are more likely than not with a professional doctorate given the entry criterion that students are mid career professionals, are competent in their field of practice and have had time to mature in their views of that practice. The issue of how to motivate students when confronted with inadequate intellectual property protections is also as yet unresolved. As indicated above, students are particularly vulnerable from the misuse of information related to project ideas where student profiles are used by institutions for advertising purposes. Students are also vulnerable where assessment by industry representatives takes place. A further point of potential vulnerability arises when the work is being assessed both internally and externally. While the risks associated

with exposure may be low, the duty of care of the educator would suggest the issues need further discussion and eventual resolution that places students' interests foremost.

It is not yet clear how to resolve the potentially competing claims of private creativity, institutional and business interests, academic interests and the interests of the consumers of new knowledge. I raise the issues for further consideration in the context of a growing concern for the ways in which those claims are currently expressed in tertiary intellectual property regulations across the developed world.

### Students' Experiences

In the next section students report on their experiences of the taught courses, 1002 and 1003.

#### Caroline

*Our first meeting with our supervisor resulted in each of us reading a book on the possible pitfalls in doing a doctorate. This gave us an appreciation of the processes involved in choosing a topic, researching and writing up as well as the breadth of thinking required. The series of lectures/ discussions in the first year provided us with opportunities to expand our thinking from the narrow perspective of our research area to a wider perspective which included placing our research in different contexts – cultural, philosophical, ethical, technical etc. Each of us was regularly required to present aspects of our research-in-progress in different contexts, and these were discussed and critically appraised, which was highly beneficial. This helped us integrate different perspectives into our research areas and was very thought provoking.*

*Our second year has been focussed on research methods. The weekends have been run as workshops/discussions where we have explored the writings of philosophers, practitioners and academics and critically analysed the approaches taken in various research papers. This led into a critical analysis of the research approaches that each of us was taking for his/her research. Having a small group of doctoral students, each researching in a totally different area, gave us a greater appreciation of the suitability and limitations of different approaches than if we had focussed only on our research topic. There was extra work in understanding and following each other's research, but the value that the discussions and critiquing gave us was immense. To be successful, this technique needs a facilitator with a broad and deep knowledge of research methods, an appreciation of the potential difficulties (hence a through understanding) of each of our areas of research, and the skill and personality to challenge, without patronising or humiliating, an eclectic mix of students. We have been well served in this course, and although we find the workload heavy, the experience has been enjoyable. More importantly, the progress made by all of us in the ability to apply trenchant critique has been noticeable.*

#### Becky

*After many years of professional practice, I am now a full time lecturer in computing on both undergraduate and postgraduate programmes. The rationale for undertaking the course of study (DComp) is based in both my intellectual interests and in academic career progression. The approach provided by the professional doctorate has been very suitable for someone who has not been a student for many years ("reality flash" number one –*

*being a teacher does not make you a good student). Balancing lecturing and demands of students with one's own study is problematical. Having set deliverables from DComp coursework contribute to milestones along the path of writing a Thesis has been very valuable. The course work has given me the necessary academic underpinnings to carry out the required research.*

*The collegiality and support provided by the group of students enrolled on the course has helped with the sharp learning curve. Strategies for managing literature and using resources have been shared and discussed among the students ("reality flash" number 2 – never underestimate the usefulness of access to online journals, high speed internet and most importantly knowledgeable and helpful Librarians). Provision of an appropriate work space (a doctoral lab with lockable storage spaces, lots whiteboards and computers) has been tremendously helpful and allows me to grab minutes in a day to work when I can – it separates research work spaces from teaching work spaces.*

*The structure of the programme encourages intense and challenging discussions on many diverse subjects including philosophy, critical thinking, logic, and important issues facing academics and practitioners in information systems and computing. The quality of supervision, facilitation, and guest lecturers has been instrumental in my gaining an understanding of what it means to work at Doctoral level.*

*My experiences during the two years classwork toward the DComp have expanded my horizons and established and encouraged my research. I have confidence in continuing with my research and understand the processes that I need to go through to complete ("reality flash" number 3 – I do understand academic speak and it does make sense).*

Jimmi

*My motivation to join the DComp program was initially to refresh my knowledge of current trends in Computing and a number of other secondary motivations that I discuss next. I have been outside academic research circles for about three years and spent these years doing practical subject teaching. I found that the kind of choices offered by the program appealed to me a lot. There was an appeal in the courses about research development, advanced scholarly inquiry, and current trends in computing area (to be taken) and also the part-time nature of the program suited me nicely.*

*My previous engagements with research were mostly practically focussed and more oriented to a specific subject starting from the very beginning. In this program I learned a lot about developing research and doing advanced scholarly inquiry from a totally different point of view. In the program, the research subject was nurtured from the ground up, with tools and methods of different perspectives, and with a lot of sceptical discussions about proposed work.*

*Also, I am learning a lot about things that I have taken for granted for years in my professional career, such as the classification of computing areas and research areas, theory and related concepts with these matters, critical thinking, philosophy, important aspects of practical research. These have been covered interactively in the program and*

*because of the way the program is structured and modelled, I have the privilege of learning about other student's research and that also positively broadens my point of view.*

*The kind of demon that I have to face now, for completing the program, is to juggle my research time with my unpredictable workload that I thought earlier would not be detrimental to my research progress. I hope I will last until the end of the program, as time is really precious.*

Peter

*My experience of the DComp programme has overall been very positive. In terms of having a small network of fellow students I have experienced a similar environment when undertaking my master of business administration, so I have a point of reference, albeit in a different context. The context of the MBA was one of all students engaged in the same learning activity, i.e. particular areas of study were common, in line with material and assessment outcomes. In the case of the DComp our respective areas of research differ which brings very wide ranging material to bear on the specific course prescribed learning activities and outcomes. This scenario leads to a greater appreciation of research in different contexts and also provides a forum for students to engage with other students in an objective, yet supportive manner. However, this same range of research activity also necessitates gaining an understanding of other student's research in order to fully contribute and of course requires a time commitment other than that of one's own research.*

*The need to provide doctoral students with material that is relevant to their own research area requires that broad concepts are introduced and then individually related to each student's specific research activities. The ability to effectively perform this relies heavily on the skill, temperament and experience of the doctoral supervisor.*

*Overall, the value of having a small network of other doctoral students to "bounce" ideas off has proved motivating and engaging for me. The potential downside of having to come to terms with the research of others has not proved to be a problem, although it would be fair to say that personality would play a strong part in ones experience of this. For students who enjoy participating in constructive debate and exploration of ideas the DComp format is ideal. For those students with a more introspective personality then the DComp experience could well prove difficult.*

### **Summary**

This New Zealand DComp, a professional doctorate in Computing and Information Technology, has solved some of the problems that arise for the traditional doctoral candidate of loneliness and the feelings of desertion that are reported in the literature (Phillips, E & Pugh D.S., 2000). The taught courses provide a useful peer supported vehicle for guiding students through the early stages of developing a grasp of current reference (and focus) discipline related issues and developments. Other problems, such as those related to metaknowledge issues, for example dealing with intellectual property, have emerged. These issues are being worked through with

administration people. Although there is a growing response from academic educators to the claims for greater engagement with industry, there is a less than smooth path through the administrative issues that plague curriculum change. It has been argued in this paper that where industry and academe intersect existing legal mechanisms will protect the intellectual property interests of professional doctoral candidates while they engage in their studies. It is particularly pleasing to be able to include in this paper the views of the students about this program. From my observation of the three courses and from considering the students' reflections above, careful planning and on-going review results in students making substantial progress in advanced study under the difficult circumstances of full employment and the usual mid career family commitments.

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