Designing, Developing and Delivering Postgraduate Computing Programmes

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ABSTRACT

UNITEC currently offers three postgraduate programmes and awaits approval of a fourth. This paper outlines the processes that have led to these programmes, and identifies some of the key factors in successful design, development and delivery. The paper also identifies ways in which the programmes are innovative or unusual (Fielden and Joyce, 2001; Joyce and Young, 1999a,b).

Keywords: Postgraduate programmes

1. INTRODUCTION

In December 1999, UNITEC received approval and accreditation from NZQA to offer two postgraduate computing qualifications: the Master of Computing (MComp) and Postgraduate Diploma in Computing (PGDipComp). The first classes began in February 2000 and by February 2002 164 students had enrolled in one or more of the MComp/PGDipComp courses and one student had completed MComp in the minimum possible time. In December 2001, UNITEC received approval and accreditation from NZQA to offer a Graduate Diploma in Computing (GradDipComp). The first 28 GradDipComp students started their courses in February 2002. Since then UNITEC has applied to NZQA for approval and accreditation to offer New Zealand's first 'professional' doctorate in computing (DComp). Behind this bald catalogue of dates, names and numbers lie five years of planning, persistence and preparation. This paper outlines the processes followed and identifies some factors which may have contributed to the positive outcomes achieved to date.

2. MASTERS AND POSTGRADUATE DIPLOMA

In May 1997 the newly appointed Head of Computing at UNITEC outlined to the Computing Advisory Committee a concept plan to develop three level 8 programmes by the year 2000: a postgraduate diploma in instructional technology, a postgraduate programme in multimedia development and a Bachelor of Computing Systems (Honours) degree. Over the following ten months, interest was expressed in the first two proposed developments by a range of interested parties, including people in academia and industry, current students and graduates.

During March and April 1998 a proposal to develop three postgraduate qualifications (certificate, diploma and masterate) in computing was reviewed by the

Faculty of Business Academic Committee, endorsed by the Computing Advisory Committee and approved by the Executive Committee. The proposed qualifications would cater for students with particular interests in interactive multimedia, instructional technology and networks.

During May and June 1998 surveys were conducted among potential students: Bachelor of Computing Systems (BCS) students, BCS graduates, and graduate diplomates (in computer based learning, computer ediucation and information systems management). The majority of the 58 respondents were interested in undertaking a master's programme on a part-time basis, involving evening and/or weekend classes. The two BCS groups (27 respondents) were most interested in evening classes in the networks area, whereas the graduate diplomates (31 respondents) preferred weekend classes on interactive multimedia or instructional technology.

At the July 1998 NACCQ Conference, 50 polytechnic lecturers from 15 polytechnics participated in a focus group on postgraduate qualifications. Strong interest was expressed in the content, delivery and structure of the proposed UNITEC programme. The multiple exit points and different threads (interactive multimedia, instructional technology and networks) were received very favourably.

During August 1998 three focus groups attended by a total of 18 industry practitioners and 12 UNITEC staff were held to identify industry needs and to obtain feedback about the proposed qualifications. There was a high degree of consensus about industry needs and participants agreed that the proposed compulsory and optional courses would assist greatly in meeting those needs. They were supportive of the structure and general approach and made many constructive suggestions about content and emphasis.

In October 1998 the development team submitted a proposal for a Master of Computing degree (with a Postgraduate Diploma and a Postgraduate Certificate as exit qualifications) to the UNITEC Academic Standards Committee. The following month the Academic Standards Committee panel provided some initial feedback to the development team, which led to significant amendment of the proposal, including the removal of the certificate. In June 1999 the revised proposal was approved by the UNITEC Academic Board and in December 1999 it was approved by the New Zealand Qualifications Authority, after a three day panel visit in October.

The first set of courses began in February 2000, with 25 students enrolled. Subsequent intakes have averaged 35 students per semester, including international students from Germany, India, Indonesia, Norway, Pakistan and Thailand. New Zealand resident students come from Auckland, Hamilton, Hutt Valley, Masterton, Otaki, Palmerston North, Tauranga, Thames and Wellington. Most students have adapted to the system of weekend classes (in Auckland or Wellington) supplemented by the use of Blackboard for announcements, discussions and messages. One even managed to complete his masters degree in the minimum time (two years) while working full time as a polytechnic lecturer! Another 25 have completed the postgraduate diploma.

3. GRADUATE DIPLOMA

UNITEC's Bachelor of Computing Systems (BCS) has been offered since 1997. Demand has been heavy, both from school leavers and from mature students. It became clear by 2001 that a substantial number of mature students would have preferred a shorter, more focussed programme of study that still reached level 7. They tended to fall in one of two categories: graduates with non-computing degrees (often from overseas) who want to acquire a substantial computing qualification in order to obtain employment; and people working in the computing field who have no (or limited) formal computing qualifications but lots of practical experience. Both groups found it a daunting prospect to study for two or three years full time, or four to six years part time, to obtain a BCS. We concluded that they would welcome the alternative of a graduate diploma programme that can reach the same level (7) in a much shorter time (one year full time or two years part time).

Since the MComp began in 2000 we have found that some applicants need a 'bridging programme' to fill the gap between their computing knowledge and academic skills, and the standards of both required on the postgraduate programme. The NZQA monitor recommended that a graduate diploma be introduced to meet this need, with the intention that students who obtain a B average in their level 7 courses would be admitted to the MComp programme.

At UNITEC, a graduate diploma consists of 120 credits at levels 6 and 7, with at least 72 credits at level 7, and a postgraduate diploma consists of 120 credits at levels 7 and 8, with at least 72 credits at level 8. During the first semester of 2001, subject groups were asked what combinations of levels 6 and 7 courses would provide coherent programmes of study. They came up with four suggested combinations, two consisting of a mix of BCS and PGDipComp courses, the other two consisting entirely of BCS courses.

Our proposal for a GradDipComp was approved by the Programme Committee, endorsed by the Advisory Committee and degree monitor, then approved by the Academic Standards Committee and Academic Board before being submitted to the New Zealand Qualifications Authority. We convinced NZQA that there was no need for a panel visit (because all GradDipComp courses were already approved for BCS or PGDipComp) and received approval in December 2001.

More than 30 applicants wanted to enrol in semester 1, 2002 and most required a one hour interview, often supplemented by emails, in order to choose their course combinations. About half (those with little or no computing in their degrees) needed to take some level 5 courses in their first semester. Eventually 28 enrolled as shown in the Table 1:

The numbers of courses taken range from one to five with 12 students being classed as full time.

Many of the part time students have chosen to enrol in evening or weekend classes. At least 10 of the full time students hope to finish their GradDipComp within 9 months of starting.

4. DOCTORATE

In 2001, the NZQA gave UNITEC approval to offer a PhD in Education, the only one outside the university sector. Soon afterwards a small group of senior UNITEC staff began to develop a proposal for 'named' (or 'professional') doctorates in computing and in education. There was some debate about the titles (DEd and DComp led to jokes about the qualifications being 'dead and decomposing'), but in the end EdD (which is used internationally) and DComp (as a follow on to MComp) were chosen.

The NZQA has guidelines for 'named doctorates', so the format was soon settled: two 30 credit courses, a 60 credit course and a 240 credit thesis. Naming the courses took longer, but the process was simplified by recognising that students need to explore the issues in their field and then identify a research topic, the relevant literature and the appropriate research method(s). Hence the titles, chosen to allow for a range of disciplines (not just computing and education):

Critical Issues in Professional Practice (60 credits), Advanced Scholarly Inquiry (30 credits) and Research Development (30 credits). Delivery of the courses will follow the MComp pattern: weekend classes supplemented by Blackboard.

The development team worked in small groups on such tasks as market research, obtaining letters of support, writing course descriptors and regulations. The author visited Melbourne University and RMIT in June 2001 to talk to staff involved in similar programmes (EdD and DBA respectively). The regulations and programme structure were approved by Academic Board in September 2001, and resource issues were examined by UNITEC's Senior Management Team in December 2001. Thirteen letters of support were received: eight from academics in Australia, New Zealand and the USA, and five from industry people in New Zealand.

31 people have indicated an interest in pursuing DComp study, including one MComp graduate and fourteen current MComp students. All have at least three years of professional computing experience; many have much more. One works in the e-learning section of a university; one is a programmer in a technical institute; two are computing consultants, one

Levels	5 only	5 and 6	5,6 and 7	5 and 7	6 only	6 and 7	7 only
Students	8	2	1	1	9	5	2

Table 1. Enrolments by Level

in local government sector, the other in the private sector; two manage IT services for institutes of technology; three are full-time Master of Computing students; and 22 are lecturers from seven of New Zealand's institutes of technology. Most market research to date has been done among lecturers and MComp students, so these groups predominate at present. Industry representatives who were approached for comments on the proposed DComp indicated that significant numbers of IT practitioners outside of the education sector would also be interested.

5. CONCLUSIONS

At the time of writing the DComp proposal is awaiting final approval by the Academic Board before being sent to the NZQA. If approved by NZQA, it will be the only professional computing doctorate in New Zealand. There are a handful in Australia and another handful in the UK. The author believes that two previous proposals succeeded because of wide consultation, thorough internal review, external scrutiny, adequate resources and lots of hard work. The latest proposal may be more subject to political considerations, particularly because views vary about professional doctorates and whether doctorates should be offered outside universities.

REFERENCES

Fielden, K. & Joyce, D. (2001). What Would a Professional Doctorate Look Like? Proceedings of 13th Annual Conference of the National Advisory Committee on Computing Qualifications, July, Napier, 437.

Joyce, D., and Young, A. (1999a). Innovation in Postgraduate Computer Science Education. ITiCSE '99 Integrating Technology into Computer Science Education Conference, June, Cracow.

Joyce, D., and Young, A. (1999b). Developing Postgraduate Qualifications for the New Learning Environment. Proceedings of 12th Annual Conference of the National Advisory Committee on Computing Qualifications, July, Dunedin.