

# From Whoa to Go in 24 hours

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*Preparing someone to teach technology in 24 hours may seem an impossible task, yet by national standards the University of Auckland primary graduate programme devotes more time to technology education than the majority of other providers within New Zealand. Should lecturers prepare students to teach in the real world in which technology is often seen as a low priority, and integrating aspects of technology, seen as the only viable option, or should they be taught the ideals and strive to achieve these in whatever ways possible within the constraints of their school? How much time should be devoted to understanding what technology education is and its place in 2007 curriculum? In the short time available do you give student teachers tips, skills and knowledge in one area or do you give them a taste of what is available but never really get into any depth? This paper outlines a primary graduate diploma course and a study undertaken to evaluate the effectiveness.*

## **Introduction**

The newly developed Faculty of Education at the University of Auckland has created a 12 month primary graduate programme, to prepare people with existing degrees to teach in a general primary classroom. This extremely intensive course has proved to be very demanding for those involved. At the same time as this programme was being developed the new 2007 curriculum replaced former curriculum documents, such as the 1995 technology curriculum. What to include in this 'pressure cooker course' where only 24 hours was devoted to technology education, proved a real challenge. Staff felt they were doing the best job they could but they wanted to ensure they were meeting their students' needs. Although the students gave the course good ratings in anonymous course evaluations, lecturers wanted a more exact feedback so they could adapt the programme where needed. Research was undertaken to determine the effectiveness of the developed programme. This paper outlines the programme and the initial research findings into its effectiveness. It is hoped that other preservice providers and experienced teachers will find this information useful and gain a better understanding of the dilemmas faced by this providers and its primary graduate diploma students.

## **Background**

Recently all New Zealand Colleges of Education have undergone great change as they 'merge' into the university system. This has been no less the case for the Auckland College

of Education as it merged with the University of Auckland. Opportunities were presented to develop new programmes of education however these also came with restrictions as all programmes needed to fit in to the university structure as a whole. The University of Auckland Primary Graduate Diploma in Teaching programme is a 1.3 EFTs programme delivered in one calendar year (Jan – Nov) and is now in its third year since its accreditation by the New Zealand Teacher's Council in October, 2005. Students are able to undertake the programme part time over two years. Courses in the programme total 160 points and are a mixture of 15 and 10 point courses. Professional and practicum courses are worth 15 points while curriculum courses are worth 10 points. Initially the programme was structured to offer three pathways:

- Campus Pathway (this pathway ceased in 2008)
- Tuesdays in Schools Pathway. We are students spend every Tuesday in a school (the only pathway to be delivered in 2009)
- Integrated Pathway (this pathway was not delivered due to workload issues).

There are two intakes each year for this programme. At the beginning of the year there are four classes of approximately 40 students, and in July there is a mid-year intake with a class of approximately 40 students. Although the programme has over 200 students it has a long waiting list for entry. Since the programme's inception, feedback has consistently noted that the assignment, teaching and study workload for students (and staff) was too high. This issue has surfaced at every programme evaluation/monitoring visit over the past three years, and annually by students on the programme's student representative committee. Measures to address issues raised have been undertaken by the Qualification Committee and though helpful, have not been sufficient to rectify the matter. This is one of the reasons why this research project was undertaken.

## **Research**

Previous research had been undertaken by university staff to investigate beginning teachers' perceptions of the effectiveness of the programme to prepare them to teach technology. This current research was designed to build on these earlier findings. The methodology used was a mixed method design defined as 'Sequential Explanatory Design' (Creswell, Plano Clark, Gutmann, & Hanson, 2003). An anonymous questionnaire was distributed in the final few weeks of the primary graduate diploma programme. This was a semester after the students completed their technology course. The questionnaire focused on documenting students' confidence and readiness to teach prior to graduation. At this time students were asked to volunteer to form a focus group. These self-selected participants were interviewed to explore issues and trends which emerged from the questionnaire data. These participants will then be interviewed toward the end of their second year as Provisionally Registered Teachers.

This paper will outline the programme undertaken by these students, in order for the reader to situate the findings which will be presented in the following section.

### **The programme**

In January of the first year of the programme inception, students completed a block course in Technology Education. This course comprised of four half-day sessions. The main focus for the block course was for students to develop an understanding of what was entailed in technology education, undertake some hands-on experiences and to gain some confidence in this learning area. These students did not undertake technology education again until their final semester where they had ten classes which were one hour ten minutes long. Classes were devoted to gaining an understanding of the 1995 and 2007 curricula and of technological practice. Class time was also given for students to complete assignment work. The following two years have seen the entire technology course being moved to the students' first semester. Students currently undertake the block course, and then complete a 10 week semester, sometimes this may be broken with a two-week practicum. Although lecturers would prefer to have the students in the final semester, having the block course being followed immediately by weekly class sessions has meant that students are building on prior knowledge rather than trying to remember what they did six months earlier.

### **The findings**

The response rate of the questionnaires was very poor (7%). With only one person volunteering to be interviewed. This is probably reflective of the fact that students completed the technology course in the first semester but completed the questionnaire at the end of their second semester. This section will outline the initial research findings, which will be discussed in the following section.

The questionnaire had three sections. The first section contained 12 questions relating to the student's understanding of the 2007 technology curriculum. The second section contained five questions focused on the student's preparedness to teach technology, with the remaining section containing four questions relating to the student's confidence to plan and assess technology. Responses were recorded on a six-point Likert scale (very poor, poor, slightly good, good, very good, excellent).

#### *Understanding of the 2007 technology curriculum*

64% of responses rated their knowledge of technology as 'good' or better. 86% of responses rated their understanding of Brief Development as 'good' or better, with 64% for Planning to Practice and 57% for Outcome Development and Evaluation.

78% of responses rated their understanding of Characteristics of Technology as 'good' or better, with 86% for Characteristics of Technological Outcomes.

86% of responses rated their understanding of Technological Products as 'good' or better, with 71% for Modelling and 78% for Systems.

Only 57% and 50% felt that the readings contributed to their understanding of technology and technology education respectively. In contrast to this most people (86%) felt that Techlink increased their understanding of technology and technology education.

#### *Preparedness to teach technology*

78% felt the course had enabled them to form good or better links between theory and teaching practice. The majority of people felt relatively prepared to teach technology education (86%). 71% believed they could provide environments which encouraged authentic experiences, and experiential (hands-on) learning (78%). Students were less confident in their ability to encourage development of tacit understanding (57%) but more confident to develop an understanding of the interrelationship between technology and society (78%).

Only 21% felt the practicum experience had prepared them to teach technology confidently. 86% thought the courses experiential (hands-on) learning activities contributed to their understanding

#### *Confidence to plan and assess technology*

86% believed the course had prepared them to plan for authentic technological learning experiences and 71% felt their planning could incorporate the characteristics of teaching and learning in technology.

Only 42% felt able to use the indicators of progression for assessment purposes and had been exposed to a range of appropriate assessment strategies for technology.

### **Discussion**

In 24 hours of class time, as a lecturer, it is extremely difficult to hold your hand on your heart and say you have prepared students to teach technology effectively. This is supported by a quote from the student who was interviewed, who stated "one paper is going to find it hard to prepare teachers for the technology curriculum... you've got so many diverse areas and you've got so much content knowledge and you have just got so much that is needed that it's really hard to design a programme around it".

Current NZ research has shown "the progress of students is significantly related to the level of pedagogical content knowledge their teachers have" (Parr & Timperley, 2008, p. 69), yet only 21% of the students saw technology occurring whilst on practicum and the student who was interviewed stated she saw "nothing". This meant that students often left the programme without either seeing or experiencing technology in action. Initially the course

had small tasters in order to give students an understanding of the various technological areas. This meant however that students didn't gain any in-depth content knowledge. This may be the reason they lacked in confidence to encourage development of tacit understanding (57%). This is an important area to address because researchers have shown that primary teachers are not confident in technological content knowledge (Jones & Moreland, 2004). For this reason subsequent courses involved an in-depth student directed project rather than one-off sessions. It is hoped that future students will report a better result because of the intrinsic motivation developed and maintained whilst undertaking this situated learning (Turnbull, 2002). This change is supported by a comment made by the interviewed student who stated, "I don't know if the mini sessions were valuable". The modified course now expects the students to undertake a long-term study in order to gain tacit knowledge. They are encouraged to work in an area in which they are unfamiliar and to design a product to meet stakeholders needs. This means students get an in-depth understanding of the skills, confidence and domain knowledge within this area. It is expected that this altered program will help empower the learners to be confident and effective in executing what they have learnt which is a key aspect for a quality teacher education program (Brashier & Norris, 2008).

By spending time focussing on one topic the Nature of Technology and Technological Knowledge Strands are able to be woven into classroom activities where applicable. For this reason rather than being seen as an add-on all three strands are covered within the 'unit topics'. Throughout this process the lecturer makes links to the curriculum, with Techlink being the sole source of readings. It is hoped this will ensure students are confident and competent to use all the material provided on Techlink ensuring teaching support in the years to follow, no matter what the time or where the school.

## **Conclusion**

Although we as technology teachers/educators often feel we are doing a good job, other than looking at external qualification results we often have no basis for these judgements. This research has enabled a group of teacher educators to evaluate the impact of their delivery. The course has been modified as a direct result of these findings and will continue to be modified as the research continues over the next two years. Changing what occurs in the class as a result of feedback is common practice in most NZ classrooms, but major course alterations are not easily achieved at a tertiary level. This sort of research is vital if we are to ensure that courses impart the knowledge, skills and attitudes needed to teach technology effectively in the current school climate. Very little research of this type has been undertaken, in any curriculum area, in New Zealand (Timperley, Wilson, Barrar, & Fung, 2007) and so has become an emphasis for the Ministry of Education (Ministry of Education, 2007). "We know little about the changes that are required of professional developers as they make their practices more responsive to the demands of the curriculum reform area" (Stein, Smith, & Silver, 1999, p. 238). In a climate where the New Zealand

media is stating new teachers are not well prepared (McKenzie-Minifie, 2007, 2008) this type of research should prove useful for institutions, who have staff often working in isolation, to develop strategies to improve their practice (Lee et al., 2008). This is vital as “most research universities establish and maintain few clear, shared criteria for good teaching”(Wright, 2005, p. 333).

“The key to better learning for students is better teaching” (Darling and Hammond as cited by, Parr & Timperley, 2008, p. 57). With teacher education the problem and solution are twofold. It is hoped that this research will enable teacher educators to provide a course which develops better teachers because it enables them to ‘be better teachers’. This will enable them to provide effective practice and tailor and adapt classes to the ongoing needs of the learners (Alton-Lee, 2003). By listening to the needs of our students we have modified our course to ensure students gain more tacit knowledge and this is linked directly with all aspects of the curriculum especially planning and assessment. As an interviewed student said "you have to be exposed and immersed in those content areas- and technology is valuable. It's incredibly valuable and it's going to be one of the, you know (sic) we don't know what jobs are going to exist tomorrow so we need to prepare children as students to the problem solvers, to be risktakers... teachers are scared to go there because they don't have the pedagogical knowledge and the content knowledge and I think, it is going to be really hard for teachers to encourage students to be risktakers if they are scared of risk-taking themselves ”. So in the 24 hours we have to prepare student teachers from no knowledge, to being ready to teach technology in their own classroom, what more can we ask of them than to be competent and confident risktakers who are enthusiastic to give technology a go.

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