

READY TO TEACH? BEGINNING TEACHERS' PERCEPTION OF THEIR PRESERVICE TECHNOLOGY EDUCATION COURSES.

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Abstract

The merger of the Auckland College of Education with the University of Auckland led to the development of new Teacher Education Programmes for the Bachelor of Education and the Graduate Diploma in Teaching (Primary and Secondary) qualifications. Technology Education was given less time within these programmes. In the period 2006-2008 not only was this challenge being faced, there was also the need to prepare student teachers not only for the current 1995 Technology Curriculum which they would be expected to follow on practicum, but also for the new 2007 Curriculum which they would be using early in their teaching careers. As previous research had been done of beginning teacher perceptions of the effectiveness of their programme in preparing them to teach technology, the technology education staff were interested to find out how effective the new courses were. The object of this research was to investigate student perceptions as their knowledge of the 2007 curriculum, and their level of confidence in teaching technology. Participants completed an anonymous questionnaire at the end of their university programme, and self selected students were also interviewed. These students will also be re-interviewed toward the end of the second year as provisionally registered teachers (PRT's). This paper discusses the initial findings from the first set of data collection completed at the end of 2008.

Introduction

Technology educators are facing major challenges as they prepare to meet the demands of the revised curriculum contained within the recently gazetted New Zealand Curriculum Framework (Ministry of Education, 2007). There is a solid body of literature (e.g. Compton & Harwood, 2003; Jones & Moreland, 2004; Moreland, Jones, & Northover, 2001) which clearly documents the problems that teachers and tertiary technology educators faced in implementing the first Technology Curriculum (Ministry of Education, 1995). These difficulties have also been experienced by other countries as they introduce technology into the curriculum (e.g. Finger & Houguet, 2007; Potgieter, 2004; Sade & Coll, 2003).

Pre-service educators face many challenges in preparing generalist and specialist beginning teachers to meet the demands of confidently and effectively teaching technology. Often pre-service teachers have inappropriate constructs of the nature of technology and technology education that must be addressed (McRobbie, Ginns & Stein, 2000). These constructs have a marked influence on the way in which technology is planned for and taught (Davies, 2003). A lack of confidence of their ability to teach technology affects teachers' ability to address cultural diversity within the classroom (MacLeod-Brudenell, 1996). The wide ranging nature of technology presents poses

problems with regard to teacher content knowledge (Barlex & Rutland, 2003; Loucks-Horsley, 2000).

Within the literature there are a number of case studies of teacher professional development in technology that cast light on effective in-service interventions. Compton and Jones (1998) describe a successful programme of teacher development in the New Zealand setting which focused on training facilitators and producing resource material for them to use with teachers. Ritchie (1995) used an action research approach in his professional development programme. Stein, McRobbie and Ginns (1999) produced a professional development model for technology education that identified three areas that needed to be addressed. There were the teacher's personal constructs and prior experience, understandings of the nature of technology and technology education, and knowledge related to the practical implementation of technology education in the primary classroom.

As pre-service teacher educators we are concerned to provide the most effective programmes to our student teachers. While our newly-developed programmes are research-based, we felt it was important to get feedback from the students and teachers who have experienced these programmes to better meet the needs of future student teachers.

Methods

The research questions aimed to find out primary and secondary provisionally registered teachers' beliefs about their readiness and capability to teach technology prior to beginning teaching, and toward the end of their second year of teaching as PRT's. A mixed methods approach was used to address this research question. An anonymous questionnaire was given to graduating student teachers to document their perceptions of their confidence and readiness to teach technology prior to graduation. After initial data analysis of the first questionnaire in 2008 12 self-selected participants were interviewed to explore issues and trends emerging from the data. The same participants will be interviewed toward the end of their second year as Provisionally Registered teachers. The process seeks to identify the level of effectiveness of pre-service and in-service technology programmes in preparing teachers to teach technology. The mixed methods design chosen can be defined as a 'Sequential Explanatory Design' (Creswell, J. Plano Clark, V. Gutmann, M. & Hanson, W., 2003, p.223). The mixed methods researcher in this design typically collects quantitative and qualitative data sequentially in two phases. An explanatory design consists of a first phase with the collecting of the quantitative data and then follows with the collection of qualitative data to help explain the quantitative results. The quantitative data gathered from a large group of student teachers will provide rich data about the perceived effectiveness of pre-service education, while the qualitative data will provide a more in depth explanations for the patterns identified from the quantitative data (Creswell, 2005). This research will be undertaken in two stages. The qualitative data collected in the second stage will be used to explain the quantitative data collected in the first stage.

The first stage (quantitative) surveyed pre-service student levels of confidence for teaching technology. All end of year graduating pre-service students in the B.Ed (Tchg), GradDipTchg (Primary), and GradDipTchg (Secondary) programmes were asked to complete an anonymous questionnaire. There were two distinct cohorts in the B.EdTchg group, those who had only done the compulsory paper in the first semester of

the three year programme (BE1) and those who also completed an optional technology paper in the final semester of the three year programme (BE2). This first stage questionnaire provided data with regards to their perceptions of the usefulness of pre-service experiences in technology education.

The second stage of the research (qualitative) was intended to further explore findings emerging from the analysis of the data collected in stage one of the research. The twelve self selected participants who were interviewed at the end of their University of Auckland teacher education programme will be re-interviewed toward the end of their second year of teaching.

This paper reports and discusses the findings from the initial stage one questionnaire data collection.

The questionnaire had 4 sections. The first 12 questions related to understanding of the 2007 technology curriculum. This was followed by 5 questions focussed on their preparedness to teach technology and 4 questions related to their confidence to plan and assess technology. The final 3 questions were related specifically to the secondary school context and were only answered by students on the Graduate Diploma in Teaching (Secondary) programme. The responses were recorded on a 6 point Likert scale (very poor, poor, slightly good, good, very good, excellent).

Findings

There was a disappointing return of the student questionnaires, only 46 (21%) of graduating students returning completed forms. This was due in some part to a delay in obtaining ethics approval and funding which meant that over half the students were already on their final practicum at the time the questionnaire was administered and these had to be sent to the schools they were in rather than being handed out in course time.

Twenty-six students (57%) felt they had a good or very good knowledge of the Technology Learning Area in the New Zealand Curriculum (Ministry of Education, 2007). Only six (13%) rated themselves as having a poor understanding, four of whom were from the BE1 cohort. B.Ed Students who had done two papers (BE2 - 67%) were twice as likely to rate their understanding as good or very good than student's who has only completed the compulsory paper (BE1-33%). There was little difference between the rating of the BE2 students and the Primary (PGD) and Secondary (SGD) Graduate Diploma students.

With regard to their understanding of the three strands within the Technology curriculum the students rated themselves higher for the Components of Practice strand, particularly brief development (75%) than for the Nature of Technology strand (55%). Their understanding of the Technological Knowledge strand was more varied, 66% rating their understanding as good or better for technological products, but rating their understanding of technological modelling and technological systems at 50%. Again, the BE1 group rated their understanding considerably lower than the other groups at 43% for Components of Practice, 25 % for the Nature of Technology strand, and only 17% for the Technological Knowledge strand.

Twenty-five students (54%) rated their course as good or better in enabling them to form links between theory and practice, including two who gave an 'excellent'

response. Less than half (48%) gave a good or better response to the question asking how well they had been prepared to teach technology. Only one of the twelve BE1 respondents was in this group.

The responses to questions on their degree of confidence in being able to provide environments which encouraged authentic experiences, experiential learning, and understanding of the interrelationship of technology and society were much more positive, ranging from 70-74%, although again the BE1 responses were considerably lower at 33-50%.

Discussion

The very different level of knowledge of the curriculum and confidence to teach technology between the two Bachelor of Education groups might have been expected in view of the fact that the group with higher rating had done a second paper, which they had just completed when filling in the questionnaire, whereas the other group had only completed one paper two years previously.

A second factor that would have impacted on this is that the one-paper group completed their course in semester one 2006, at which time the revised curriculum was still in its development stage, the draft curriculum (Ministry of Education, 2006) coming out just after the course finished. This group had been informed of the proposed changes to the 1995 Technology curriculum (Ministry of Education, 1995) as members of the teaching team had been involved in the revision process, but the main emphasis in the course was still on the nature of technology incorporated in the 1995 document. The questionnaire in 2008 only asked them to rate their understanding of the 2007 Technology curriculum, which they may not have seen or investigated. While this may influence the findings regarding understanding of the curriculum it would not have influenced their ratings with regard to confidence to plan, teach, and assess technology to the extent shown in the questionnaire responses.

However the low self-reported ratings of this one-paper group are cause of real concern and reflect the impact of the move from two compulsory technology education papers in the earlier Auckland College of Education degree to one compulsory paper in the University of Auckland degree that replaced it. In the light of the 2008 student course evaluation the compulsory paper was modified in 2009 to give a greater emphasis on the planning and assessment. As in 2009 the focus was also completely on the 2007 Technology curriculum it is expected that when the 2009 intake are questioned in 2011 that their levels of knowledge and confidence will be higher than the 2006 intake reported in this paper.

The levels of knowledge of the curriculum, and of confidence to plan and assess technology were slightly higher for PGD group than the BE2 group, and slightly lower with regard to their confidence to teach technology. It might have been expected that the PGD group would more closely match the BE1 group as the PGD group only had one 10 credit paper in the year-long course, compared to the 15 credit papers in the B.ED which had more time allocated to them. Two factors may account for the PGD level of response. Firstly, as a graduate diploma student body they came in with a higher level of academic experience than the Bachelor of Education students and were more familiar with the expectations of university courses with regard to readings and assessment tasks. They were likely therefore to be more able to absorb the material of the technology course. Secondly they spent one day a week in a base school, as well as

completing normal practicum placements. They were therefore more likely to be seeing and discussing technology with practicing teachers than the B.Ed. students.

Although the small number (5) of responses by the SGD students was too small to make any general statements, one element that stands out is the range of responses within the five students. Often ranging from poor to very good for the same question. These students had completed three technology papers over the year, and it was their major teaching subject so it might have been expected that their responses would range from good to excellent, but two of the students clearly felt less-prepared to teach than the other three.

Conclusion

Although the sample was smaller than intended the results of this first application of the graduating-teacher questionnaire has indicated some areas of concern that the technology staff are working to address. The impact of moving from two compulsory papers to one seems quite dramatic and some change to the one compulsory paper has already been made. The results from the 2009 questionnaires may show some improvement in the ratings of the BE1 2007 intake as in that year the focus was much greater on the 2007 Technology curriculum than had been the case for the 2006 intake represented in the results discussed here. As we work on analysing the transcripts of the 12 post-questionnaire interviews we expect to be able to more explicitly explore the factors underpinning the patterns within the responses to the questionnaire.

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