Method or madness? The path to successful undergraduate research.

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Abstract

This paper discusses the process undertaken to guide and support third year Diploma of Teaching (ECE) students through small research projects carried out during a practicum placement. From setting and defining their own topics, ethical considerations and data collection and analysis, students develop a sound understanding of research skills and processes. The structure and support systems provided have ensured that students and their practicum centres find the studies useful and relevant. A significant outcome from the research projects has been the enhancement of the critical thinking and analytical skills of students and their ability to apply the learning in their ongoing professional development as practising teachers.

Introduction

As the major philosophical base underpinning the Diploma of Teaching (ECE) programme of Whitireia Community Polytechnic is humanist and social constructivist, research provides an opportunity for students to work in an independent but supportive environment, and investigate a question of concern to them in their professional practice. Each year, as part of the professional development strand, third year students select an area of professional interest then design and conduct a research project during teaching experience.

As yet we have found no New Zealand research into the process of teaching research to teacher education students, nor any about the effectiveness of teaching research skills on the practice of these teachers when they enter early childhood centres. Therefore, it was of interest to us to explore this issue further, given our strong belief that it is essential for graduates to leave with the skills to carry out research in their future teaching practice, and to experience the process of carrying out a research project. Our own school of teacher education has had a programme of undergraduate research running during the past few years, based on a carefully structured and supported process. We consider that it is timely to review and evaluate its success and appropriateness. Our review of literature from overseas universities and tertiary institutes not only supports the inclusion of undergraduate research, but also concurs with the need for a structured approach and guided support.

The purpose of this study is to examine and ascertain the value of the processes and outcomes of the students conducting research projects from the perspective of graduate early childhood teachers and teaching staff involved. The method used in this qualitative study includes feedback from students through questionnaires, and the reflections of supervising lecturers (including ourselves).

Review of literature

Our searches revealed a variety of literature on teaching research for undergraduate students in science-based and nursing courses. While there is a little literature advocating action research (e.g. Liston & Zeichner, 1990; Russell, 2000), and even less describing the teaching of action research in

undergraduate teacher education, we have found none about the kind of small scale studies in which our students are engaged.

The multiple benefits of having undergraduate students conduct research are outlined by Rodrick and Dickmeyer (2002). Having taught research methods and worked with communications undergraduates, Rodrick and Dickmeyer claim that although there is no one ideal method for teaching the skills, the core ingredients must include an understanding of the rationale and process of research, a variety of different research designs, the skills for critical evaluation and research vocabulary.

Amongst the benefits of supporting undergraduates through the research process, Malachowski (1997), Campbell (1999), Craig (1999), Hitchcock and Murphy (1999), and Monte (2000) agree that professional attitudes between faculty members and students are greatly enhanced through collaboration. The enthusiasm of lecturers grew as a result of the positive attitudinal changes in students who became involved in real-life academic enquiry. This in turn, raised the profile of the majority of faculties where undergraduates were involved in research.

Further claims of the educational benefits of undergraduate research are alluded to by Hitchcock and Murphy (1999). They describe the increase in skills such as critical reflection into professional practice resulting in a heightened awareness of the requirements of their profession, describing research as a powerful learning tool. This, they conclude, resulted in significant and positive attitudinal changes in students. The findings of Rodrick and Dickmeyer (2002) support this, stating that undergraduate research often transforms the educational experience. Taking ownership of a project and resolving real ethical and professional problems helps to create professional practitioners in their field. Furthermore, Malachowski (1997) highlights the relationships formed during collaborative mentoring of students as being significant in the establishment of improved motivation and learning dispositions of undergraduates.

Whilst Porter (2001) questions the evaluation strategies and validity of some reports of teaching using research methods with undergraduate nursing students, her conclusion is generally favourable. Porter's main concern is that robust and accurate, scientifically produced results emerge. This, she claims, will add credibility to the teaching of research to undergraduates. Porter suggests that "…sparking the spirit of enquiry…" (p. 9) in students is of high value, particularly in a collaborative learning environment. Rodrick and Dickmeyer (2002) add that students who discover the intrinsic value of conducting research will be more likely to further contribute to their profession throughout their career. These points were strongly supported by the Boyer Commission (1998), when reporting to American Universities on increasing the quality of undergraduate education that the skills gained from conducting research were of immense value to the workforce.

Such claims are complementary to those of Harrison, Lowery and Bailey (1991) Dvorak, Brophy, Binder and Carlson (1993) and Hitchcock and Murphy (1999) who have found little or limited value in the teaching practice that requires students to write a research proposal only, without conducting research. Dvorak et al. (1993) remark that such processes lack the component of teaching critical thinking, whilst Harrison et al. (1991) suggests that any learning gained from writing only a proposal is quickly lost.

Recent New Zealand literature concerning research and teaching tends to focus on the importance of carrying out research on teaching and teacher education, and on the relationship between research and practice. For example, Snook (2001) draws substantially on a report by the Australian Department of Education, Training and Youth Affairs (DETYA, 2000) to address the usefulness and relevance of educational research for teachers of education. While Snook's paper attends to the importance of research informing practice, it also contains observations and questions about doing research – notably "how to present research to students in ways which not only encourage them to 'use' it (in both 'instrumental' and 'enlightenment' ways) but motivates them to remain critical consumers of and contributors to research for the whole of their professional lives" (pp. 10-11). This emphasis on using research is elaborated further in terms of personal and contextual reflection for practice. Snook's observations point to questions about, and confusions between, perceptions of 'proper'

research and 'other' research such as reflective practice and 'action research'. Reporting his own reflections on the Australian research, Snook concludes with the importance of not only understanding research, but also understanding the distinctions between research and ideology.

Confusion about views of research and the fragility of the potential for teacher research are aspects that Russell (2000) also comments on:

> It takes time to develop an understanding of teacher research and action research. Because this activity views research quite differently from familiar connotations of 'research,' it takes no more than one or two inadvertent remarks to undercut the intentions and potential of teacher research". (p. 12)

Both Porter (2001) and Russell (2000) believe in the value of teaching undergraduate students how to conduct research so that it is seen as a natural part of a professional's life rather that something exceptional. Russell advocates the use of action research with undergraduate teachers. "My personal approach to introducing and supporting action research by preservice teachers begins with the simple premise that it can be done and that it should be considered a normal and on-going part of a teacher's professional activities". (pp. 3-4)

Mullen (2000) undertakes an "exploratory study…on ways to approach the complex, intangible dynamic at work in the learning of graduate students in qualitative research courses" (p. 5). Using distinctions between "conventional (and analytic) and alternative (and creative) research methods" (p. 6), Mullen casts her net much wider than others to explore teaching research. Mullen also argues that "educators need to connect live performances of research to their pedagogy and to share the discoveries made by students in concert with themselves" (p. 5). The emphasis in this study is on collaborative, participatory workshop approaches to learning to do research. Unlike Russell, Mullen takes a much broader perspective on action in relation to research and explores creative implications in approaches such as arts-based research.

Recent papers from researchers within two New Zealand Colleges of Education reinforce the importance of reflective practice for teaching and learning, but do not discuss reflective practice in relation to students actually carrying out research.

Anderson, Begg, Fox, Hagenson, Hansen, Heyward, Hill, Rutherford, Sheehan, Sinclair and Williams, (2001) cite the Auckland College of Education Baseline Statement (ACE Reflection Staff Development Team, 1999) on the importance of "centrality of reflection to the graduation of teachers with the ability to confront and challenge their own beliefs, values and assumptions and the ability to communicate this to others" (p. 1). The researchers report on the college's B. Ed (Tchg) programme and its "underpinning philosophy…of reflection and inquiry" (p. 1). 'Inquiry' is characterised by following quotation

> *Observation, analysis, interpretation, decision-making*, and an ability to *think critically* are examples of the types of thinking which must pervade and be required of students within the programmes of work. Such activity is essential to the development of a teacher who will be able to function as a *self-aware, self-critical professional who is able to employ multiple perspectives when carrying out inquiry.* (ACE, 1996, cited in Anderson et al. 2001, p. 4, emphasis added)

Similarly Brunton, Ferry and Watson (2001) address the Wellington College of Education philosophy and practices for 'inquiry'. Their paper "describes a systematic approach to developing reflective practice…based on collaboration between teacher educators and student teachers" (p. 1). The authors say

> In the final year students undertake an inquiry into their own practice, which is based on *identification of issues of personal significance*. Student teachers are required to *review the relevant literature, formulate and implement an action plan*

within a practicum and *reflect on their own learning and professional development.* At the end of the three year course student teachers are required to *present a portfolio of professional practice*, which demonstrates their development as teachers". (p. 1, emphasis added)

Their conclusion highlights commissioned external research supporting the positive impact of the "sequential process described in this paper" (p. 5), by stating, "In Renwick's interviews with tutor teachers, the beginning teacher's ability to reflect and critically analyse their practice was the most commonly reported factor in the success of their teaching" (p. 5).

Although these reports emphasise the important role of reflective practice and critical analysis, alongside research-like abilities such as identification of issues, literature reviews, observation and analysis in the development of teachers, it is unclear whether the students actually engage in research.

The Australian DETYA (2000) report, referred to above, while focussed on the impact of educational research on teaching, offers valuable insights into understanding research. In particular, chapter four of the report, *Teacher knowledge in action*, notes a "new role of the teacher educator in attempting to pull theory and practice together is one of mediation between the theoretical research literature and the practice experiences of beginning teachers and other expert practitioners" (p. 381). Whilst this observation refers to how research affects teaching practice, it highlights the complex nature of inter-relationships involved in understanding research, and the following elaborates this further.

> Educational researchers in the United States have referred recently to the 'new paradigm wars' (Anderson & Herr, 1999) to describe the 'battles' between so-called practitioner knowledge and the epistemology of the research universities. It would seem that, despite the acceptance by many educational researchers and practitioners of the role of reflective practice and action research (Schon, 1983, 1995; Zeichner & Liston, 1987), Dewey's 'wisdom of practice' has still not fully bridged the theoretical and practical divide. The problem, according to Robinson (1998), lies with the research-practice gap 'when the theories of researchers do not articulate with the theories of practitioners' and she concludes that 'a much neglected reason for the limited contribution of research to the understanding and improvement of educational practice is the mismatch between educational research methodologies and the generic features of practice' (p.17). Robinson defines practices (including policies) as solutions to problems. (p. 382).

Summary
While the literature search has not yet revealed work that specifically addresses the teaching of research to undergraduate education students, it has located material that surrounds the questions this research project is studying.

Several clear issues have emerged. Firstly, that theory is best learned when interconnected with practice, as theory alone does not construct an in-depth understanding of the role of research. Furthermore, critical reflection on practice is most effective when a formal process is used to focus the practitioner.

Secondly, the following abilities are agreed to be essential components of teacher education: The identification of issues of personal significance; reviews of the relevant literature; and inter-relationships between observation, analysis, interpretation, decision-making, thinking critically and the development of a self-aware, self-critical professional who is able to employ multiple perspectives when carrying out inquiry teaching practice.

Thirdly research can be a powerful tool to develop critical awareness and the ability to improve the practice of professionals, as well as improving the quality of undergraduate education.

Finally, there appear to be several different perspectives regarding the meaning of research and its role in teaching. Perhaps if this were clarified to allow a definition appropriate to teacher education, the image of research or inquiry would be demystified.

The claims of positive outcomes for teaching research practices to undergraduate students are significant. It is necessary, then, that within the educational institutions of New Zealand, sound and robust research is conducted into the value of using research as a teaching tool with undergraduate students. It is hoped that this study will contribute to the research by investigating the impact of undergraduate research on the professional knowledge and practice of teachers.

Research context

The existing research module of the three-year Whitireia Community Polytechnic Diploma of Teaching (ECE) makes up the entire professional development strand for the final year of study. Its purpose is to prepare student teachers for professional practice in early childhood education settings in New Zealand. The intention is to provide them with skills and knowledge to carry out research once they are working as teachers, and with skills and knowledge to critique current research in the field. It is also aimed at developing their ability and confidence to engage in ongoing professional inquiry with the aim of improving their teaching practice.

In keeping with the humanist philosophy of the School of Teacher Education and Training, the process used to teach this module is one of structured support and development. Support is provided through a series of classes that guide students through the necessary research skills and processes. Support is also provided through individual supervision. Teaching approaches include class and group discussions, peer feedback, regular sharing of research progress, directed reading, and the completion of sign-posted tasks related to each stage of the research process. These tasks are presented to the supervisor or in class for formative feedback and constructive advice. Completion of each task is required before the student can move on to the next step of the research.

In the initial teaching sessions, students explore educational research theory and practice, and the role of research in educational development through a process of discussion and debate aimed at developing understanding from their existing knowledge.

Having acquired a basic understanding of what is involved in carrying out research and what has interested other educational researchers, students are carefully guided through a process of exploring a broad area of professional interest and narrowing it down to a researchable question. At this stage, through class and small group discussion, lecturers model the thinking that takes place when considering what is manageable for small scale research in an early childhood setting. Lecturers also explain how to word a research question clearly, and what ethical and pragmatic issues might arise. It is at this stage that the supervisors allocated to each student first become involved with the individual student researchers by assisting them to develop their manageable, well-defined research question.

By the time the initial questions are formulated, students have explored ethics in research, a range of research methods and ways of searching for and reviewing literature. The students are then required to complete, and have approved, a Whitireia Community Polytechnic Research Ethics Committee form, along with templates of questionnaire, interview schedules or observation sheets, a participant information sheet and a consent form. Again supervisors become involved in the process of guiding students as well as in providing the final approval for the research to begin.

In the build up to this stage, students are engaged in constant sharing of ideas about research processes with their peers, and they also provide each other with feedback aimed at assisting them in the development of sound questions and ethical practices. Furthermore, during the initial literature search stage, which starts in the previous year when discussions about the research begins, students are actively encouraged to work with peers researching in similar areas, and to seek the expertise of academic staff with similar interests or expertise. During this collaborative process the research proposal is developed and this culminates with a brief presentation by the students to peers and

supervisors, outlining their research question, research design, ethical considerations and the anticipated research context. This is a very powerful moment, as students get to share the development of their thinking with others, and receive both constructive feedback and positive encouragement for their creative efforts.

Data collection is undertaken during a teaching practicum in an early childhood setting and is done with the support of the student's teaching associate and practicum lecturer. After completion of the practicum, students are taken through processes of data analysis and select the most effective method for working with their own data. Ideas are again sought in a collaborative forum and discussions in both small and large groups take place. Supervisors, too, are involved as they provide constructive feedback about the management of data and the development of themes, charts and discussion.

One of the tasks that the students find most demanding is the writing of the literature review. To ease this process, students begin searching for and analysing the literature in year two, and they are required to present a draft of their literature review soon after completion of data collection. They are guided carefully through the processes of searching for suitable literature, identifying themes that emerge from the literature, and constructing integrated arguments about the ideas. Again, this is done with a combination of interactive lectures, peer workshops, and individual work with supervisors. While most students find it more demanding than any other writing they have done, the intention is to engage in the critical thinking necessary in research and to develop a stronger understanding of the issues informing their work, as well as to see models of published research.

Research design

The purpose of this study is to determine the effectiveness of the process of support and guidance provided during this final year strand of professional development, and the impact on the professional development of teachers graduating from the Diploma of Teaching (ECE) from Whitireia Community Polytechnic. While we had received much anecdotal feedback from students and graduates about the process of carrying out research, we had not previously formally investigated the process or evaluated the effects of their learning from this strand on their teaching in early childhood settings. To evaluate the effectiveness as outlined above, we invited graduates of the 2001 class to share their ideas, thoughts and personal reflections about the process of learning how to research, and the impact this has had on their professional practice. Lecturers who have had a role as supervisors for students enrolled in this strand, were also invited to share their perceptions of the process and the effectiveness of this on changing students' professional practice.

As we were interested in investigating the impact of undergraduate research in terms of the perceptions of the participants (both the teachers and supervisors), we decided to use a qualitative approach. Denzin and Lincoln (1994, p. 4) emphasise the importance of the researcher, the interpretive, naturalistic approach to studying how people bring meaning to a phenomenon, and a focus on process. Bogden and Biklen (1992) and Creswell (1994) also see qualitative research as involving a process that allows the voice of the participants to come through and an inductive approach to analysis.

As the graduates of the Diploma of Teaching (ECE) have moved into the workforce, the chosen design for the research data collection stage was to seek the ideas, thoughts and reflections of past students of the programme using questionnaires. A questionnaire was also used to collect the reflections of supervising lecturers from the School of Teacher Education and Training. Both questionnaires, in keeping with our intention to enable the views of the participants to emerge, used open-ended questions that elicited the participants' perception of the support provided, the students' experience of the research process and the impact of the strand on their professional growth and practice.

The questionnaires were posted to participants along with an information sheet and included a return envelope. No names were required on questionnaires, thus providing for anonymity. Having said this, because there are such a small number of graduates and lecturers, it must be acknowledged that

most of the respondents were identifiable to us. This was made clear in the information sheet allowing participants to choose whether or not they wished to contribute. The information sheet also made clear that in our reporting of the research, no one would be identifiable, and that all data would be destroyed on completion of the data analysis.

The data from graduates is in the process of being sorted and analysed using a grounded theory approach to identify firstly, the aspects that participants found valuable and secondly, what changes have taken place with the teachers' professional practice. The grounded theory approach is described, by Strauss and Corbin (1990, p. 24), as a "qualitative research method that uses a systematic set of procedures to develop an inductively derived grounded theory about a phenomenon". A key feature of this theory is that it uses a "constant comparative" method of analysis (Strauss & Corbin, 1994). This means that the emerging categories or theory are continuously matched with the original data (Strauss & Corbin, 1990).

Issues arising from the data analysis so far form the basis of a discussion in this paper of the advantages and disadvantages of undergraduate research in the context of the study. We also discuss possible future directions for the professional development strand in the Diploma of Teaching (ECE) programme and any changes that might be undertaken as a result of this research.

It should be noted that the two researchers were both supervisors of students undertaking research, as well as being the key lecturers for the strand. As stated earlier, our own reflections will be included in the analysis of the data. However, this will be made explicit throughout the reporting and the discussion of findings, to better ensure the internal validity of the research.

To further strengthen internal validity we intend to use peer checks of our analysis of data before the research has been finalised. This will ensure that the categories and themes that arise make sense (Merriam, 2001). Possible researcher bias will be made transparent through the identification of our views, perceptions and assumptions throughout the reporting of the research. The data analysis procedures will also assist in improving internal validity by involving constant comparison of data with the emerging themes. Extracts from the questionnaires will be used to illustrate the findings.

Because this study is about a specific phenomenon in a specific situation, it is not intended to be generalisable beyond the group being studied. However, it is hoped that it will contribute to a much discussed, but little researched, field in teacher education in New Zealand and overseas.

Data analysis and discussion

In keeping with the grounded theory (Strauss & Corbin (1990) approach of this research, the analysis of data and discussion of the findings will be supported by excerpts from participants' responses. It must be remembered that these findings are provisional as the research is still in progress at the time of writing. However, the data discussed herein suggests clear indications of highly relevant feedback to guide future development of the year 3 research paper.

Findings will be discussed firstly with the graduates' feedback, using the questionnaire as a framework and discussing patterns of response emerging from each question. This will be followed with a similar process using the supervising lecturers' questionnaire responses. The thoughts and personal reflections of the authors will be included in this section.

Class profile
The Diploma of Teaching (ECE) year 3, 2001 class was comprised of a multi-ethnic and mixed age group of 23 women and one man. The ages ranged from 21 to late fifties. Several students had entered the programme from non-English speaking backgrounds. No student had previously undertaken any form of research prior to taking this paper. However they had been involved in reflective practices throughout their three years in the Diploma of Teaching (ECE) and had been expected to engage continually with key educational issues.

Graduate teacher responses
The first of the five questions asked of graduate teachers sought their reflected thoughts on the value of the process undertaken when carrying out their research.

All responses indicated that their original perception of research was that it was hard and daunting. One participant articulates the perception of many students that research is not something they regard as being easily accessible.

> In the beginning of this research I found it really hard to concentrate and to understand how I could do this.

Gough (2000) remarks on the image of research as forbidding due to the number of unfamiliar terminologies and concepts that have to be applied. However, all participants found that the most valuable aspect of the process was the scaffolding provided within the monitoring of each research stage and the support that this offered. For example:

> The supervision and assessment steps helped keep me on task to ensure all necessary steps were completed…I would have been totally lost without the step by step guide you put in place.

This response indicates the value that students placed on the steps and process approach of the assignment.

Responses such as the following, support the claims of Brunton, Ferry and Watson (2001) that a systematic approach to teaching the skills required to think critically requires a collaborative approach to research.

> There were high expectations throughout the assessments and it pushed me to put 110% effort into the work. The support and feedback was honest, critical and encouraging….but by the end of the module I was glad…as I think it reflected in the finished product.

However, as the main lecturers in the research module, it is interesting for us to now reflect on the responses of students during the stages of the assessment tasks we set them. Although we had explained the collaborative approach and articulated the value of the supervisor/researcher

relationship it was not until the end that many students appreciated what this meant in practice. This is also articulated in responses such as:

> I needed to complete the whole project to understand the benefits of "doing" a research project.

> It was a big undertaking and it did connect in the end.

Overall the responses of participating graduate teachers were positive and reflective. All perceived personal value in undertaking the research project and found that the support and structure made the process manageable.

The second question asked participants to consider any changes they might suggest that would improve the experience of undertaking the research project.
This is an important question for us as authors as it embodies the main purpose of undertaking this current research.

Comments were able to be grouped into four main areas: Making links between literature and findings, time-frames, selecting topics, and working independently.

The first of these areas, discussing the difficulty in making links between the relevance of literature and findings, might well be a part of the whole cycle of learning as a researcher.

> I couldn't see the link between literature review …and how this [had] to do with my own findings until I had actually done it

> …if I had been clear from the outset I possibly would have looked at the literature & my choice of research to review differently

Hitchcock and Murphy (1999) discuss the development of skills and the process that new researchers go through on the way to gaining understanding. This includes gaining higher levels of skills in critical reflection and supports Rodrick and Dickmeyer (2002) who claim that undertaking research can transform the educational experience. It is equally likely that this experience is also related to claims that simply writing a proposal or undertaking literature reviews mean little if it is not related to a more concrete experience.

Time-frames, the second issue raised by graduates, covers two areas. One suggestion was to start teaching some of the prerequisite skills earlier. This has in fact already been undertaken for the subsequent group of students. As Gough (2000) claims, research is a difficult undertaking and there are indeed many skills to apply, supporting the suggestion that

> …more emphasis in year 1 & 2 could be placed on correct referencing procedures.

However, one participant suggested shortening the time-frame for the research module as they felt that it also coincided with other large undertakings.

> The shorter the time objective, the more intense is the student's interest and enthusiasm

It is possible that by dealing with some of the prerequisite skills in years one and two that more emphasis could be placed on other areas of the research tasks in year three. This may reduce the amount of formal class time needed and allow students greater flexibility in their use of time. However care needs to be taken not to shorten the process in ways that could mean important reflective time is removed.

The third area concerned the selection of topics. Suggestions made included limiting the choice of students and giving suggestions of topics.

> I found it difficult choosing a "subject" and then forming a question. It may be helpful to be given a choice of predetermined subject/questions of choosing your own.

This was in stark contrast to another response that emphasises the importance of working independently.

> I suggest working hard to get more information and study really hard on them, but not just sit there and wait for the tutors to tell you everything or give you everything. That means you do nothing. But if you try and do this you will independently improve the experiences…

The fourth area, the notion of taking responsibility was also articulated by Malachowski (1997) and Rodrick and Dickmeyer (2002) who emphasise the importance of the student taking ownership of a project. However, the selection of topics is never easy and the process that is undertaken ensures the viability and ethical appropriateness of each topic before it can proceed. This year, students were given ideas of the types of questions used by the previous year's class.

The third question asked graduate teachers to discuss their perceptions of the value of undertaking a full research project in their final year of study for the Diploma of Teaching. All responses indicated a longer-term benefit and looked towards their ongoing teaching career and further study.

> …for future academic study and projects - maybe further research into early childhood education

> It is valuable in that you gain an insight into the whole arena of education and that an understanding of education is not just about teaching children, but can go a lot deeper if you have the desire to do so. In other words, show you how diverse the industry is.

As suggested by the Boyer Commission (1998), these responses confirm that the skills and dispositions gained by undergraduates whilst conducting research is of immense value to the workforce.

Further values perceived by participants included a growth in confidence and academic discipline. A participant who expressed an increased respect for the process of undertaking research also reinforced this.

> Preparation for what can be expected when undertaking further research in education. I think the main value is using this knowledge in a professional work environment and being able to conduct research that is of benefit to the ECE profession….I wouldn't have had the first clue about how to undertake an research project or have the same respect for how important the process is.

The fourth question asked for participants to think about how the research project had changed the way they think about their professional practice. Again, participants articulated positive change from original perceptions of research as being somewhat mysterious and only for the select few.

> It certainly made me as a practitioner in ECE feel on the equal level of researcher and with that equality, could feel confident in carrying out future research.

> I feel more confident in challenging practices…as opposed to blindly agreeing and being like a sheep. I say this because I feel knowledgeable about looking at things from a more critical perspective.

This further emphasises the value to the profession of providing students with the opportunity to engage in the dynamics of change and growth at the workplace level. As expressed by Robinson (1998), theory and practice must meet at a professional level to provide growth in the field. These practitioners are expressing a feeling of empowerment to provide instruments of change and enhancement in their field.

The final question asked graduate teachers to say how they had used their research skills and knowledge in their practice. The positive responses again reflected the literature by demonstrating links between the research skills and reflective teaching practice.

> With the particular subject I researched, it made me aware of how to put into place steps for literacy amongst pre-school children…understanding research is essential to better teaching and self-development. [this participant's research focus was on literacy development]

> Having the confidence to use research to be the best teacher I can be…In all honesty I initially thought that this module was going to be a complete waste of time…in the end I was incredibly proud of what I produced and glad to be given the opportunity as a Diploma student…

Another graduate described the experience of feeling confident as a new teacher when being required by a kindergarten association to undertake a research project as part of professional development.

For beginning teachers to be able to experience research and make links to their own practice and the practice of others, demonstrates the value to the profession of fostering a culture of research. Within the early childhood profession there has historically been little research conducted by practising teachers.

Te Whaariki, the early childhood curriculum (Ministry of Education, 1996) emphasises the need for practice within each early childhood setting to provide the most effective learning opportunities for the community of children and their families represented. By promoting in teachers a spirit of inquiry, combined with the skills to think in critically reflective ways, the feeling of empowerment that these participants have expressed demonstrates the potential for growth in the early childhood field.

Supervisors' responses

As stated in the literature (Malachowski, 1997; Campbell, 1999; Craig, 1999; Hitchcock & Murphy, 1999; Monte, 2000), a collaborative approach between student and research supervisor provides a reciprocal environment of enthusiasm and positive professional attitudes. In this study, the responses of the graduate teachers appear to reinforce this, as illustrated in the previous section of this paper. Supervising lecturers were also asked questions regarding their perceptions of the professional growth that occurred in the students they supervised, and the extent to which the research strand contributed to this.

The first question addressed to supervising lecturers asked about the skills and knowledge that they believed students gained during the research work. The focus of supervisors' responses covered both the technical and the cognitive skills of research. The technical skills included the following:

- Accessing information
- Computer skills
- Familiarity with how to obtain information e.g. journals, Proquest and Eric
- Finding documents, analysing, interpreting and summarising

- Writing from a position an supporting this with data and literature
- Academic writing style was enhanced
- Oral presentation styles were extended and enhanced
- Drawing a lot of information together, separating it out into individual themes
- Developing a structure
- Developing conclusions based on findings
- Linking findings to literature
- Ethical procedures

These responses support the feelings of the graduate participants that the process gave them the opportunities to enhance their academic skills and provided them with the confidence to undertake further academic and professional studies, or to undertake further research in the workplace.

The second area seen as significant by supervisors was the development of cognitive skills. Skills such as:

- Analysing
- Identifying key themes
- Critical reflection to a degree, limited by the fact that this is a difficult process to develop and is a life-long task
- Increased understanding of research and its implication for ECE
- Increased their own philosophy of ECE and teaching approach
- Subject knowledge extended

As supervisors, we also found that students who were initially reluctant to undertake research projects, perhaps daunted by facing a new task, grew in confidence during the year. For some, the emergence of new reflective and analytical skills transformed their approach to learning and visibly enhanced their own self-belief. This supports the view of Rodrick and Dickmeyer (2002) who refer to undergraduate research as often transforming the educational process.

The second question asked supervising lecturers how they saw the processes used in teaching contributed to the development of skills and knowledge. All supervisors were involved in the process of taking students through the required tasks. Three of us were also involved in the classroom teaching of the professional development (research) strand.

Comments covered the following areas:

- Staff support and united goals
- Security of supportive environment
- Sharing discussions
- Freedom of choices for topics/methods
- Variety of tutors available with individual attention and access to other lecturers
- The literature review was problematic (for ESOL students)
- The development of confidence

The responses of lecturers were generally positive. The increased workload that supervising research brings is often problematic as it has to be fitted in with other commitments. However, as previously indicated, the enthusiasm and collegial spirit affects supervising lecturers as well as students.

Areas considered problematic, apart from time, surrounded the literature review, especially for students with non-English speaking backgrounds. Furthermore, determining what, and to what extent, a student has learned can be difficult to ascertain, especially when working across cultures. This was clearly expressed by one supervising lecturer.

> ...it is not possible to know what a student has really learned, how much did the 'hidden curriculum' influence etc?? – And how do you always know what you have learned??

As indicated by one participating supervisor, it is critical to the learning process that the student and supervisor have an agreed understanding between them. This is especially true in cross-cultural learning contexts as the diversity of contextualisation can cause misunderstanding (Creswell 1994).

By returning to the responses of graduate teachers, some of the problems such as writing a review of literature, can be addressed by incorporating more of the skills into the previous years of study. Providing students with opportunities to develop the analytical and written skills earlier would make the process less stressful for students and supervisors, allowing more focus to be given to other facets of the research process.

The third question asked supervisors to reflect on the changes they saw in their students, not only in their research skills but also in their ability to engage in critical enquiry of professional practice. Responses from lecturers generally provided a more interpretive approach than those of the students, but essentially made similar points.

> A growing of confidence in their ability to complete a piece of research
>
> A feeling of achievement and exhilaration at the end
>
> A sense of satisfaction in seeing how the results added to or affirmed research already done
>
> For students with English as a second language it gave a real sense of honour and esteem when they achieved the research…

Other problems were identified by supervisors regarding ESOL students. The fact that some required considerable extra support had been noted and certainly contributed to the workload of some supervisors. The feedback received during this current study will provide the basis for strategies to address these issues. Again, this can certainly be partially addressed by introducing some of the skills related to literature at an earlier stage and providing extra support in academic writing skills.

Other responses also emphasised points already made by the graduates,

> A growing understanding of research and how it can be accomplished by qualified practitioners
>
> The fact that it was something achievable, not an unobtainable idea
>
> That their work was small, but valued and important
>
> That in the future they could pursue further research
>
> That they could see ECE in a critical manner in that they had a better understanding of what was involved
>
> They knew how to uncover research to support or dispel ideas and theories.
>
> That what they did in terms of research could make a difference to ECE

Conclusion

This study explored the thoughts and reflections of participating graduate teachers and their supervising lecturers from the Whitireia Community Polytechnic Diploma of Teaching (ECE) Year Three professional development strand, through the use of questionnaires with a few guiding questions. The professional development strand requires students to undertake a research project and although students are supported and guided throughout the process, they select their own topic with the approval of their supervisor, and conduct the research during a practicum placement in an ECE setting.

The responses of participants have so far revealed several themes. Interestingly, the responses of graduate teachers and supervising lecturers were similar in many areas.

The major theme to emerge from graduates was the initial fear that research was not something that they felt comfortable tackling. The term 'research' appeared to be shrouded in mystery and seemed forbidding. Although many found it hard, particularly those from non-English speaking backgrounds, the supportive and collaborative environment combined with the structured process made accomplishment possible. Lecturers too identified the initial foreboding felt by students.

The usefulness of skills and knowledge gained during the process was reflected by both graduates and lecturers. Graduate teachers articulated the many ways that they felt the process useful and relevant for their teaching practice in the workforce. They all felt empowered to undertake further research and at least one has already done so. Even if they have not yet had the opportunity to contribute to further research, the skills acquired by undertaking the research project has been reflected in their ability to critically evaluate their own teaching practice and the general practice observed in the workplace.

Supervising lecturers generally reflected on positive changes in critical thinking and self-confidence. Most identified attitudinal changes in their students and a willingness to challenge ideas.

Changes that could be made to the strand involve extending the teaching and constructing of prerequisite skills at an earlier stage. This will remove some stress and ensure that no students feel disempowered by being confronted with so many new concepts.

Overall, the research module provides students with a sense of accomplishment and provides them with an appreciation of research as an integral aspect of good teaching practice. Even if they never complete another research project themselves, graduate teachers appear to have gained a far greater appreciation of the relevance of research (both carrying out and reading) to the ongoing development of teaching practice and a heightened understanding of critical reflection in their own practice.

As stated, this research is still in progress. This study strongly supports our recent decision to modify the professional development strand to involve students in action research. This will provide greater emphasis on critical reflection of their own practice, while maintaining the benefits of carrying out a rigorous piece of research.

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