

**Discovering ako: Promoting reciprocal
learning about research
through student/tutor mentoring
relationships**

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This paper reports on the baseline findings of a mentoring project designed to promote a research culture within a New Zealand teacher education programme for early childhood students. Questionnaires provided qualitative and quantitative data to establish a measure of students' research literacy skills, and the use of research, by tutors and students in their teaching practices. A measure of the students' ability to understand, analyse, apply and evaluate research was also established. The Maori concept of ako, which recognizes the value of a reciprocal teaching/learning relationship, underpins this mentoring project.

Introduction

Increasingly, in undergraduate tertiary education, there is an expectation that research is integrated within the teaching curriculum. However, there is considerable variance in the ways that teachers and students conceptualize the linkage between research and teaching. In New Zealand, the Tertiary Education Strategy requires “a research culture within which undergraduates learn to take a research-based approach to their lifelong educational development” (Ministry of Education, 2002, p.60). Ministry initiatives, such as Ako Aotearoa, have been implemented to investigate, through research evidence, how the links between teaching and learning can be strengthened. This paper reports on the introduction of a mentoring programme used as an approach to strengthen the use of research by tutors and students within an initial teacher education programme. While traditionally, the approach to mentoring in academic institutions has been guidance of a mentee by a mentor, with more knowledge and expertise, the mentoring programme at this institution has used a different approach. Mentoring relationships were developed around the Maori concept of ako, which acknowledges the role of teacher and learner as reciprocal. Students and tutors were therefore given the opportunity to participate in mentoring meetings where mentor and mentee were viewed as more equal participants and learning about research was seen as a reciprocal process.

Research highlights wide variance in the use of research within tertiary education (Healey, 2005; Hoddinott, 2005; Brew, 2006; Robertson and Blacker, 2007; Wareham and Trowler, 2007). Healey (2005) has proposed a framework for curriculum design which suggests the range of ways that students and tutors might engage with research in learning and assessment activities. Using two continuums, Healey contrasts the different ways that research is taught. On one continuum, he contrasts an approach where research content and outcomes are central to the curriculum, with another that emphasizes research processes and problems. On a second continuum, he contrasts students as audience, (passive learners) and students as participants (active learners). A further model, offered by Blackmore and Fraser (2003, pp135-137) highlights four ways that research can be integrated into the curriculum: outcomes (research informed curriculum), process (students learning how to research), research tools (methods) and context (the broader culture within which the research takes place). Wareham and Trowler (2007) highlight the importance of using a social constructionist approach in the use of research; one that emphasizes the key role of contextual factors.

The models of Healey (2005) and Blackmore and Fraser (2003) were a useful framework to review how research was being used within the early childhood tertiary training institution where this project was later conducted. Research at the time of this review, was being used by students primarily to support their ideas in assignments; while tutors were using research articles primarily to confirm what they taught. Research was seen mostly as an academic requirement rather than the basis of evidence based teaching practice and ongoing professional development within early childhood centres. Therefore, the use of research within this institution only partly met the policy objectives of the Tertiary Education Strategy. Healey's model was useful in developing discussion with tutors about the use of research within College and what new approach could be taken to strengthen the links between curriculum and teaching practice. To encourage both students and tutors to be more active in the use of research within an early childhood context, a research mentoring programme was introduced.

A key aim of this project was to encourage reciprocal learning between tutors and students around a research topic with current relevance to early childhood education. Therefore, this project strongly aligned with the social constructivist and socio-cultural approach to learning which is embedded in Te Whāriki, the New Zealand Early Childhood curriculum. This curriculum "emphasizes the critical role of socially and culturally mediated learning and of reciprocal and responsive relationships" (Ministry of Education, 1996, p.9). A social constructivist approach views both the context in which learning occurs and the social contexts that learners bring to their learning environment, as crucial aspects of learning. This approach enables intersubjectivity, a "shared understanding based on a common focus of attention and some shared pre-suppositions that form the ground for communication" (Rogoff, 1990, p.71). Knowledge is shaped and evolved through negotiation within a communicating group. Intersubjectivity enables people to extend their understanding of new information and activities among the members of the community to which they belong (Rogoff, 1990).

Also underpinning this project, conceptually, was the Māori concept of ako. In tertiary education this concept has been used to describe the teaching and learning relationship as one "where the educator is also learning from the students and where educators' practices are informed by the latest research and are both deliberate and reflective. Ako is grounded in the principle of reciprocity and also recognizes that the learner and whānau can not be separated" (Ministry of Education, 2008, p.22). If the whānau can be viewed as a source of lived experiences which inform further learning, an analogy could be drawn between a Maori whānau and the whānau of early childhood teachers, who are often described as members of a community of learners.

The project seeks to evaluate the effect of the mentoring programme in building a research culture and the research capacity of both students and tutors. This paper reports baseline data around the research skills and application of research by tutors and students, before the research mentoring project was introduced. Additionally, the report describes the differing positions and perceptions held by tutors and students around the possibilities of mentoring at the pre-mentoring phase of the project.

Methodology

At the beginning of their third year of study, students in a New Zealand initial teacher training institution for early childhood teachers were invited to participate in a research mentoring programme. Student participants were asked to select a research topic which related to early childhood curriculum and practices. Tutors were then invited to be a mentor for students who shared an interest in the same topic. It was suggested to the students that this topic could become a specialist area and pathway for their career within early childhood. While most tutors were matched according to a topic of mutual research interest and their professional experience within early childhood, some tutors agreed to support a student who had an area of interest outside their own area of experience. Some staff, who were not involved in tutoring, also volunteered to be mentors. Seventeen staff members of the College (twelve tutors, four administration staff, and the College director) and twenty one year three students were involved. For consistency throughout this paper all staff members involved in the project have been described, according to their role in the research, as tutors. Before the project was implemented ethical approval for this project was given by the College Ethics Committee, a letter describing the nature of involvement was given to all participants and written consent was obtained from all those who wished to be involved.

A mixed method approach was used to gather both qualitative and quantitative data throughout the project. A baseline measure of research skills was taken before the mentoring programme. Both student and tutor participants completed questionnaires which asked them to consider their research proficiency, their use of research, and their hopes for what the mentoring programme might offer.

Quantitative data was sought through Likert scales where students self-rated their research skills, according to how much improvement they believed they needed. Further data was gathered to measure the students' ability to critique a research article. A content analysis was used to rate their written responses against an assessment scale based on a revised framework of Bloom's Taxonomy of Thinking, by Anderson and Krathwohl, (2001) - see appendix (1) for the measurement scale used. Students were given a score of 0-3 according to their level of understanding, application, analysis and evaluation. A mean score was then given for each of these levels. To ensure reliability, an inter-rater reliability test was conducted. The responses of all student participants were independently marked by two assessors. A consistent assessment for each of the areas assessed: understanding, application, analysis and evaluation was attained. Clarification was made to the analysis segment of the critique to ensure consistency. This assessment tool will be repeated at the end of the mentoring project so that a comparative analysis can measure any change in the students' capacity to engage in the process of research article critique

Qualitative data was gained through tutors' and students' comments in response to questions about their expectations of the mentoring relationship. Tutors were also asked to describe how they used research in their teaching. The same questions will be repeated at the end of the mentoring project to ascertain any changes tutors and students have to perceptions of mentoring. This will also highlight changes to how tutors might be using research in their teaching since participating in the mentoring programme.

Throughout the project, further data will be collected via research journals, which will be subjected to content analysis. Finally, thematic analysis from focus group discussion will also

contribute to an evaluation of the impact of the research mentoring programme on the integration of research into this tertiary environment.

Findings

The student questionnaire sought to assess the extent to which student participants were inclined and able to access research literature to help explore problems of practice. It also required students to self-report on their proficiency with respect to their research skills; and to document their hopes for what the mentoring programme would bring. I have used this questionnaire's framework as a structure to report findings. The same procedure is repeated with respect to the tutor questionnaire.

How do students and tutors access research?

To begin the questionnaire, students were presented with a scenario where they had to imagine being asked by a peer about a topical issue in early childhood education. They were then asked: what resources would you turn to, to support this discussion and take it further? Only nine of the twenty one students stated that they would use the internet or refer to research journals and research articles. Fifteen students stated that they would refer to other sources such as a newspaper, text books, magazines, and "people's own experiences."

Tutors' responses, to a similar questionnaire, reflected that they would use a wider range of research-based resources. Eight of the seventeen tutor/mentors suggested research journals and ten referred to a data base e.g. Pro-quest (2) ERIC (1) or web site: Statistics New Zealand (2) Ministry of Education web site (3) Ministry of Health (1). Three tutors suggested the use of ERO reports and two referred to a recent North and South article. However, only one tutor stated named a specific research journal.

How do students rate their research skills?

To explore student's perceptions of their research skills before beginning the mentoring programme, they were asked to self-rate their ability to undertake basic research activities. They were also asked to consider how much improvement to their research skills they considered necessary, using a scale of "much improvement," "some improvement" and "no improvement" (with 1 being the need for no improvement and 3 the need for much improvement). From these ratings it was possible to produce a mean score for each of the questionnaire items. Students' responses are summarized in Table 1. The research skills that students identified as needing most improvement were: the ability to identify the limitations of a piece of research, and to identify the current debates within the topic being researched. Each of these skills attained a mean score of 2.5. Further skills which were identified as needing improvement (mean score 2.4) were: using articles to write an academic literature review and identifying the methodological orientation of the research topic.

Table 1: Student self-reporting of research skill proficiency

2. When thinking about your current research skills how would you rate your ability to:		Mean *
a)	find a research article using a data base	2.2
b)	limit your data base search if you get too many hits	1.8
c)	understand what a research article is about	2.1
d)	identify the methodological orientation of your research topic	2.4
e)	identify the strengths of a piece of research	2.2
f)	identify the limitations of a piece of research	2.5
g)	identify key researchers in the topic that you are researching	2.1
h)	use Te Whaariki to support the rationale for your research	2.2
i)	identify similar and dissimilar themes across research articles related to your topic	2.3
j)	identify current debates within the topic you are researching	2.5
k)	use research articles to produce an academic literature review	2.4
l)	identify gaps in current research about the topic you are researching	2.4
* 1= no improvement needed, 2 =some improvement needed, 3=much improvement needed		

How do students and tutors apply research?

To further explore their familiarity with and use of research, students and tutors were asked to name the latest research article they had read and to identify where it was published. Almost half of the students gave no response. Only four students could identify a research journal or data base in their answer. Students were also asked to rate the impact of this research article, using a scale of 1-3 (3 being a lot, 2 a bit, 1 not at all. Refer to Table 2). Almost half the students indicated that the research article had made them think about their teaching practice and make changes to their practice. However, few respondents were able to give specific examples of changes they had actually made to support their teaching. Nine students offered vague links e.g. “I did drama”, “I used instruments”, “I was more careful and open minded in cultural practices”, “I encouraged the use of private speech”. The majority of students (12) did not attempt to answer this question.

Tutors were also asked to rate the impact that a research article, read recently, had on their teaching practices. The strongest impact reported was “to confirm what they teach” (mean 2.5). However, tutors’ responses showed that the article had less impact on changing the content of their courses (mean 2.0). Other areas reported to have had less impact were in arousing their interest and making them want to read more (1.9) and discussing the research with other tutors (mean 1.9) or with students (mean 2.1). Similarly, for the students, the research article had little impact in leading them to discuss the article with someone else (mean score 1.5). For both students and tutors the research article had not made a strong impact in leading them to trying something new in their teaching (mean score 1.9).

Table 2: Student use of a research article recently read

4.	to what extent did this research article	Mean *
a)	make you think about your teaching practice	2.5
b)	make you want to change your teaching practices	2.2
c)	lead you to trying something new on practicum	1.9
d)	lead you to discuss any of the ideas with someone else	1.5
e)	give you new ideas about how to teach	2.1
*	3 = a lot, 2 = a bit, 1 = not at all	

Table 3: Tutor use of a research article recently read

4.	To what extent did this research article:	Mean *
a)	make you think differently about what you teach the students at College?	2.1
b)	confirm what you teach the students at College?	2.5
c)	lead to changes in what you teach?	1.9
d)	make you want to change the content of your courses ?	2.0
e)	promote discussion of the ideas in it with the students at College?	2.1
f)	arouse your interest in the topic and make you want to read more	1.9
g)	lead you to discussing the research with other tutors ?	1.9
*	3 = a lot, 2 = a bit, 1 = not at all	

How do tutors use research?

When asked to describe their use of published research articles, tutor responses centred around three themes: the use of research to support teaching, curriculum development and professional development. Table 4 summarises their responses.

Table 4: Tutor use of research articles

Teaching support	<ul style="list-style-type: none"> To back up what I'm teaching and saying Planning and preparation Clarify my thinking about a topic Incorporating ideas Handouts/readings for students To support theories Support my handouts Ensure teaching is relevant
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Curriculum development and documentation	To influence and inform my curriculum areas To inform College quality assurance documents
Professional development	Upgrade professional thinking Update my knowledge To challenge entrenched ideas and extend my knowledge Pass ideas onto teaching team To keep up to date with leadership development To support own research areas Studies outside College

Students' critique of a research article

To assess their ability to critique a research article and apply the research findings to teaching practice, students were asked to analyse a research article provided to them and to write a critical summary of that article. Their responses were assessed according to: understanding, application, analysis and evaluation; criteria devised by Anderson and Krathwohl (2001). Two markers scored the students' capacity to demonstrate each of the criterion using specific descriptors for each criterion. Understanding was scored according to the student's ability to identify the research focus, while application was scored according to the student's ability to relate the research findings to teaching practice. Analysis required the student to analyze the method and theoretical perspective of the article and evaluation required a judgment of the strengths and limitations of the research article. A score between 0 and 3 was allocated to each of the four levels of thinking and a mean score was then calculated. The possible range 0-3 represented no critical analysis (0) to a very good level of critical analysis (3). Twelve of the twenty one students accurately described the focus of the research article, nine students were able to make a link between the article and teaching practice, and two students attempted to analyse the article. Only one student attempted to evaluate the article.

Table 2 Assessment of students' capacity to critically analyze a research article

Level of critique	Mean score
Understanding	1.0
Application	.57
Analysis	.09
Evaluation	.04

What did students and tutors expect from mentoring?

The final section of the questionnaire focused on students' and tutors' expectations of the mentoring project they were about to participate in. For students, mentoring was commonly perceived in terms of guidance and reassurance e.g. "staying on the right track," "making sure I'm following what is being asked of me with this assignment." Guidance was described in terms of setting goals, locating research articles e.g. "to put me in the write [sic] direction to find great research articles, and "forming key questions." Several students hoped that tutors would help them to understand the content of research articles, "extend their knowledge" and "further their understanding." They saw the possibility of "having another viewpoint of another tutor" and "getting a new train of thought." Most students expected that the tutors would share their knowledge and practical experience of the topic. They hoped for "knowledgeable discussion" which would extend their ideas around their topic. Specifically, one student hoped that through the mentoring relationship she would gain "information that will extend me and my thinking about

computers in early childhood.” However, out of the twenty one students who responded, only one student saw mentoring as an opportunity for learning how to critique research.

When tutors were asked to reflect on the type of mentoring relationship they would like to develop with their students, a common theme was mutuality. Tutors described their hope for the mentoring relationship with ideas such as:

- “a willingness to participate and engage in learning together with another person”
- “that it feels equitable like a sharing of minds”
- “a reciprocal learning environment”
- “we both will contribute to the promotion of a research culture”
- “that we both grow and develop a better understanding about research and its uses.”

Some tutors had strongly related to the key aim of the project “ako”. One tutor this approach by stated that her role was “to build a reciprocal responsive and collaborative relationship where we are both learning and extending our knowledge.” Similarly, another tutor stated: “I understand that the teacher is a learner and the learner is a teacher and together we learn.”

In contrast to the students, who saw mentoring mostly as a way to get help to find and understand the content of research articles, tutors saw mentoring as a way to develop analytical and critical thinking. Most tutors described their contribution to mentoring in terms of extending students’ thinking through questioning, reflective thinking, analysis and critique of research articles e.g:

- “to share and build on learning by challenging thinking process and conclusions”
- “to ask reflective questions, provoke thought and challenge current thought”
- “to evaluate literature in regard to another person’s learning”
- “to ask leading questions through drawing out ideas and possible future questions.”

Clearly tutors saw the discussion of research articles as a way to develop higher level thinking. However, the majority of tutors had not considered their role as one which could enable students to see the application of research findings to teaching practice.

When asked to consider their own contribution to the mentoring relationship, students were particularly articulate about the need to be motivated and well prepared “so that we are both not waisting [sic] time, “to come prepared to the meetings with readings and questions, goals and aims.” Other students described their contribution as “dedication” “commitment” and “bringing a passion for the topic.”

Tutors expectations of what the students might bring to the mentoring relationship highlighted, again, the theme of mutual benefit. This was expressed in the following ways:

- “I hope that the mentoring relationship will provide an ECE perspective that I lack and that the student will trigger some excitement in the analytic thinking process”
- “new ideas and information to support my own”
- “current and up to date knowledge on the topic and new perspectives”
- “different insight into a topic I am already passionate about.”

Tutors also indicated that their own research interests could be motivated by the students’ interests and “shared passion”, which one tutor hoped would inspire her to continue her own researching.

Discussion

Data from the pre-mentoring programme has produced a measure of research literacy at the college, before the implementation of a specific teaching/learning programme designed to improve research literacy. It has produced a range of findings, against which it will be possible to measure the impact of mentoring the research literacy skills of the students and the research culture within the College at the end of the programme. The main findings of the pre-mentoring data gathering can be summarized in relation to “research use and proficiency” and “expectations of mentoring.”

Research proficiency

Analysis of students’ self-rated assessment of their research skills showed that in all areas, except limiting the number of “hits” in data base searching, students considered that improvement was needed. Comparison of the mean scores showed that the areas in which students considered most improvement was needed were analysis (e.g. identifying similar and dissimilar themes) and evaluation (e.g. identifying the strength and limitations of the research). The researchers’ assessment of students’ ability to critique a research article also showed their limited ability to analyse and evaluate research. The assessment tool, based on Anderson and Krathwohl taxonomy of educational objectives, showed that few students were able to analyze or evaluate the article. While a mean score of 1.0 was given for their understanding of the article’s key focus and research findings, mean scores reduced as higher levels of thinking were required. A mean score of .09 was obtained for analysis of the article and a mean score of .04 was given for evaluation of the article.

Use of research

Data from the questionnaire shows that the use of research in the College, as perceived by tutors, is primarily to support the content of their teaching subjects e.g. to confirm what they teach. Students made few specific links between research and their own teaching practices. When viewed against Healey’s model of curriculum design and the research-teaching nexus (2005), there was an emphasis on research content being used to inform the curriculum. There was little evidence, in the questionnaire data, of tutors using a research-oriented approach where the process of constructing knowledge around a subject was integral to the teaching. Students were more engaged in reading research, rather than involved on the process of participating in research.

Students’ awareness of the context of research, as described by Blackmore and Fraser, (2003) was limited. Both tutors and students reported that they had observed little discussion of research within the College. Few students could apply research findings to teaching practice. This was shown both in the questionnaire and in the assessment of students’ ability to critique a research article based on a revised model of Bloom’s taxonomy of thinking. The practical application of evidence-based practice, developed from research findings, is a professional practice which urgently needs attention within early childhood centres, but also within teacher training. How to promote the use of research in teaching practice, by students as well as teachers, is an essential question to address in teacher training.

Expectations of Mentoring

The majority of students saw the mentoring as an approach where they would personally benefit e.g. getting practical support, guidance and furthering their understanding of research articles. Tutors however, were more aware of mutual benefit, e.g. “a sharing of minds” and “responsive,

reciprocal learning.” They were already linking their ideas about mentoring to the ako concept underpinning this research project. Some tutors have anticipated that mentoring could benefit their own professional development e.g. with new ideas and information and being inspired to continue their own researching. They look forward to sharing their knowledge, but also hope to have their knowledge updated through the research articles which students contribute. Most students, however, had not perceived the possibility that they could contribute to the learning or extend the thinking of their tutor mentor.

To align with the concept of ako, which underpins this project, a changing perception of the relationship between tutors and students will be required. A shift from the traditional view of tutor, as the knowledge expert, and student, as recipient of this knowledge is needed. A considerable shift will be required for some students to learn that they can also contribute to the knowledge of a tutor. Students, as well as tutors, will need to recognize that the mentoring relationship has the potential to enable responsive and reciprocal learning; a relationship where students and tutors can be both learners and teachers. As future early childhood teachers, this is an opportunity for students to experience learning as a socio-constructivist, therefore gaining insight into the underpinning philosophy of Te Whaariki, the New Zealand early childhood curriculum. Learning to make meaning of research articles, together with their tutor mentors, will help students experience intersubjectivity; described by Rogoff (1990, p.71) as a “shared understanding based on a common focus.” This project will also require students to be more proactive through sourcing research articles to discuss with their tutor mentor and coming to mentoring meetings prepared with questions concerning research findings and their application to teaching practice. For the many students used to being passive, rather than active learners, and for those without the experience of working together with a tutor as a co-learner, this could be an empowering shift towards a new experience of learning about the value of their own knowledge. It is hoped that the mentoring project will help students and tutors recognize the value of ako and that a “sharing of minds” strengthens the integration between teaching and learning within the College.

On completion of the mentoring programme, further data will be obtained through questionnaires, content analysis of research journals and the critique of a research article to provide post mentoring data to use as a comparable measure against pre-mentoring data. This data will provide a basis to evaluate the effect of the mentoring programme in promoting a research culture and how, through reciprocal relationships, the research capacity of both tutors and students may have increased.

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Appendix

Appendix 1

Analysis of students' critical summary of a research article						
Level of Critique	Level of response	0	1	2	3	Mean score
Comprehension	0 does not show key focus of research 1 shows key focus of research 2 states key focus and/or key findings of research 3 states key focus and key findings of research					
Application	0 no link between research and teaching practice 1 a link between research and teaching practice 2 some links between research and teaching practice 3 clear links between research and teaching practice					
Analysis	0 no comment on use of method or theory 1 a comment on use of method or theory 2 comments on use of method or theory 3 comments on use of method and theory					
Evaluation	0 no attempt to identify strengths and limitations of research 1 valid comment on strengths and/or limitations of research 2 valid comments on strengths and/or limitations of research 3 valid comments on strengths and limitations of research					