THE FEMINISATION OF TEACHER EDUCATION

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Abstract

This study reports on how one teacher educator at a large university in New Zealand used the feminisation of teacher education to promote social justice in primary science education course. A qualitative methods approach using focus group discussions over the length of a science education course examined how these primary education student teachers (n = 7) used the course's content to disrupt the normative attitudes, beliefs and behaviours of both their male and female student and mentor teachers. These student teachers' explicit feminisation of their teaching practice were explored in weekly focus group discussions. Results indicate that these student teachers were able to challenge the normative attitudes, beliefs and behaviours of how their students, mentor teachers, and schools viewed them as male or female student teachers.

Key words: *primary teacher education, science education, gender studies, teacher cognition*

1. Introduction

New Zealand is a multicultural society representing over 200 ethnicities (2013, p. 12). While the numeric majority are Pākehā/European (Pākehā is a term referring to non-Indigenous New Zealanders) there is a significant Māori (Indigenous New Zealanders) population with recognised customs and traditions and growing Asian and Pacific Island identities (Statistics New Zealand, 2014). However, nearly 80% of all teachers are Pākehā/European of which in primary education 82% are female with an average age of 50 (Ministry of Education, 2005).

New Zealand like Australia, England, USA, Canada and Finland has reported a declining male primary teacher population (Cushman, 2008, Lahelma, 2014, Martino, 2014, McGrath and Sinclair, 2013). As a result, New Zealand has seen concerns raised over the 'feminisation' of primary education and how this may be impacting on boys (Cushman, 2010, Jones, 2014, Moir, 2014). In 2006, Morwenna Griffiths highlighted that the feminisation of teaching is not quite what it seems. She noted the most often understanding of feminisation concerned the number of women in teaching, especially in early childhood and primary education. This has resulting in concerns of boys needing male role models as the teaching profession has become dominated by women, however, Griffiths (2006) noted numerous studies which have shown how boys are not disadvantaged by being taught by women. According to Griffiths, the feminisation of teaching should not be about the numeric majority of women in teaching but should be seen as, "*a response to perceived injustice. Power relations and power structures constrain who may belong in any social sphere*" (Griffiths, 2006, p. 395). When seen as a response to social injustice issues in education feminisation of teaching is universal and applicable to men and women. Significant to this chapter, Griffiths remarks on the benefits of schools having not only both men and women in schools but also all their diversities.

Feminisation viewed as a response to social injustice instead of the numeric majority of females in primary education, highlights the importance of diversity in schools. There is a growing body of research on how gender matching does not address concerns of boys' education (see for example Drudy, 2008, Marsh, Martin, and Cheng, 2008, Neugebauer, Helbig, and Landmann, 2011, Riddell and Tett, 2010). Wayne Martino (2014) examined the limits of role modelling as a policy frame in teacher education and concluded that the focus should not be on how male primary teachers are role models to young men but what role do male primary teachers have in education and in the lives of young men. As it is not just male teachers' role in education that should be considered, this paper reports on how one teacher educator is using the feminisation of teacher education as a response to social injustice to disrupt the normative attitudes, beliefs and behaviours (Heasley and Crane, 2012) in primary education.

Specifically this study's research question was: How is one teacher educator able to influence the student teachers' ability to feminise explicitly their teaching practice through primary science.

2. New Zealand education

There is now one curriculum document that applies to all English-medium schools from Years 1-13 (Ministry of Education, 2007) which accounts for nearly 95% of school-aged students in New Zealand. This document was to be implemented fully by the start of the 2010 school year. At the time of implementation, there was no formal professional development in what changes were made or how to interpret these changes. The learning area of Science was just one area that underwent some significant changes.

Prior to the 2007 curriculum document, each of the eight learning areas of the primary curriculum were addressed in their own document (see for example Ministry of Education, 1993). These documents provided a year-by-year list of activities that students could do. The 2007 curriculum, however, does not contain a single activity. Teachers should now focus on science content that is relevant, useful and meaningful to their school's setting using teaching as inquiry (Ministry of Education, 2007, Sexton, 2015). Teachers should be doing this, but a 2012 report by the New Zealand's Education Review Office noted that most schools investigated were not effectively delivering science education.

2.1 Science in Primary Education

In 2012, the Education Review Office reported that only about 27% of the schools investigated were effectively implementing science education programmes (Education Review Office, 2012). Many teachers reported a lack of confidence in teaching science, not having appropriate equipment, and a crowded curriculum that favoured Literacy and Numeracy. Teachers in those classrooms with effective science programmes were not only highly enthusiastic about teaching science but also acted as facilitators of student directed learning. Effective teachers utilised questioning techniques that encouraged reflective thought, student often worked in collaborative groups talking about the science they were doing and activities challenged what the students thought they knew about the world around them.

3. One teacher educator's feminization of science education

For this study's author, the feminisation of teacher education means promoting the social justice of student teachers. Gender has been an organising factor for educational practices (Lahelma, 2014). Brown and Walshaw (2014) in reporting on gender in education noted that studies investigating gender are often driven by essentialist theories. They then go on to argue from poststructural theories how gender should be seen, "*as something we do, rather than something that we are"* (p. 83). They highlight how gender equality involves, "*accepting, negotiating or rejecting what is constantly being offered as appropriate for male and female students*" (p. 84). Gendered practices in school are a complex mixture of formal and informal educational, cultural, social and political discourses about male and female identifications. Brown and Walshaw (2014) provide a poststructural theoretical foundation for this study:

Each classroom cohort of students operates within its particular regime of truth, all the while legitimising and sanctioning 'ordinary' and taken for granted particularities of gendered practice. In this way gendered equalities and gendered inequalities come to be reproduced. (p. 84)

Primary students want good teachers and are able to tell you what makes a good teacher for them and this is not a gendered teacher (Sexton, 2012), therefore, both male and female student teachers need to be good teacher for all of their students. Both male and female teachers should effectively teach Science, as it is a New Zealand curriculum requirement. This study argues the feminisation of teacher education is a response to social injustice in primary education.

It has been reported that preservice teachers come to teacher education with beliefs about science education (Dickson and Kadbey, 2014). Dickson and Kadbey highlighted that science teachers go on to teach the way they were taught. Similarly, teachers who have their own negative views pass these on to their students (Ucar, 2012). Ucar noted that teacher training programmes should not only focus on perservice teachers' lack of content knowledge but also their beliefs regarding the subject. The feminisation of teacher education challenges these beliefs by explicitly exploring the student teacher's beliefs about their prior experiences in science and science education. The role of student teachers both male and female in the education of both boys and girls through the context of science is challenged.

3.1 Participants

Ethics was obtained prior to beginning this study. The student teachers were informed that their participation was voluntarily. The student teachers for this chapter are from a 2014 undergraduate primary education programme at a large university in New Zealand. The participants included were all over the age of 18 and voluntarily choose to participate in this study. As part of their final year, student teachers are assigned to a primary classroom for the year. These student teachers began in January 2014 with a two-week block in their assigned classroom to see how their mentor teacher establish routines, the programme and behaviour management. Then they continued in this same classroom one-day per week for another nine weeks before undergoing a three-week sustained teaching experience. In semester 2, they returned to this classroom for three weeks of one-day per week before completing a five-week sustained teaching experience.

In their initial teacher education programme, these student teachers select two curriculum subject areas for further study in the final-year of their degree. Science is one of these options. The course consists of ten two-hour sessions. The student teachers come to the first tutorial after having spent two-weeks in their school setting. During this time, they are required to conduct discussions with both their students and mentor teacher about science. With their students, they explicitly ask what they did last year in science, what they remember about science from last year, why was what they did science and what do they want to do this year. The student teachers then discuss with their mentor teacher what science would be most appropriate for this class. During the first tutorial, which is facilitator initiated, the rest of the course's content is determine by what the student teachers want to teach in their own classes. In 2014, the content ranged from exploring explosions, electricity, space to gardening (see Table 1).

The student teachers attended weekly focus group sessions as part of their course. These focus group sessions were informal, unstructured and comments recorded by pen and paper as notes so as to present a casual atmosphere of collegial sharing. The content was student driven about their understanding of the course's content and its implementation in their teaching practice. This study's researcher facilitated these sessions. When the researcher noted a particular comment by a student teacher, the student teacher was contacted by email. These email exchanges allowed the student teacher to elaborate on what they meant and ensured that the researcher accurately reported the student teacher's concern, comment, or opinion.

Week	Course Content	Explicit Nature of Science – The New Zealand Curriculum
1	Agar jelly dishes: Using science to explain school/class rules	Reviewing *The New Zealand Curriculum*'s science learning area: Nature of Science and the four Content Strands
2	Cool bombs: Common kitchen ingredients	How Investigating in Science and Understanding about Science link
3	Mini-beasts: How to investigate the Living World, ethics of science	The importance of students being able to use the correct vocabulary to talk about science
4	Change of State: How to Physical World is different from the Material World	Relating the science to students' everyday world
5	Gardening: What do we think we know about plants, fruit and vegetables	Using Science content to demonstrate Participating and Contributing
6	Space: How big is big	Effective models to Investigate in science
7	Planet Earth: Volcanoes, Tornados, Weather – the way or planet behaves	How to incorporate appropriate vocabulary for students
8	Games: Putting your knowledge to the test	Types of fun that facilitate student learning about their world
9	Electricity: How you can make a radio in five minutes	Integration of all four elements of the curriculum's Nature of Science
10	Explosions: How and why you can set students on fire	Integration of all four elements of the curriculum's Nature of Science

Table 1: Course Structure

3.2 The feminisation of teacher education through science education

As stated, this research is based on one teacher educator feminising teacher education through science education. The feminisation required this programme to challenge the student teachers' beliefs about their prior experiences in science and science education. This programme challenged student teachers' beliefs in science and science education through practical tutorials.

The feminisation of teacher education requires the disruption of normative attitudes, beliefs and behaviours of the classroom and school culture in terms of primary science education. Of the 26 student teachers in the 2014 cohort, seven offered evidence of how they challenged the normative attitudes, beliefs and behaviours of the classroom, school culture and science. Barbara (all names are pseudonyms) and Harry self-identify as Māori. Both bring strong tikanga Māori (the cultural ways of being Māori) and te reo Māori (the Māori language) and see the social justice of mainstream education as paramount for indigenous Māori. Amy and John self-identify as a lesbian woman and gay male, respectively. While their sexuality is a part of their identity, it is not the only aspect and both want to be seen as a teacher not the lesbian or gay teacher. Jenny came to this ITE programme as a mature 51-year-old adult after raising her own family and is now working towards a new career. Mark comes from a strong religious background. He has attended only religious foundation schools and his religion plays a significant role in his life. He sees education and his religious beliefs as working together and not in opposition. Finally, in 2014 Luke was a semi-professional club rugby player. Last year he

completed his ITE programme and now is in a classroom teaching. He is still playing club rugby. Luke has a commanding physical presence. He stands just under 190 centimetres and weighs approximately 90 kilograms. While rugby is a personal passion, he does not want to be the school's rugby coach. He wants to be a primary teacher who can bring his skills in rugby to the school as an asset.

In 2014, these three female student teachers were in upper primary classrooms (see Table 2, below) and the four males were in lower primary classrooms.

Student Teacher	Age	Year Level	Average Age in Class	Class size
Barbara	21	6	11	28
Amy	23	6	11	29
Jenny	51	5-6	10-11	18
Mark	24	3	8	23
John	27	2	7	26
Luke	24	1	6	22
Harry	20	1	6	20

Table 2: Participants

4. Results: Challenging the normative attitudes, beliefs and behaviours

4.1 Barbara and Harry

The science tutorials in the programme (see Table 1) were designed to challenge the student teachers' everyday knowledge, experience and culture (Plonczak, 2008). According to Plonczak such an approach allows student teachers not only an understanding of the scientific knowledge but also the social, economical, political and cultural issues. For Barbara and Harry these issues were important. For them, science education cannot be an abstract entity removed from their or their students' reality that focuses on ready-made concepts. Education through the context of science should stimulate students' thinking as a way of explaining how any why their world does weird and wonderful things.

Barbara and Harry self-identify as Māori. For them their cultural beliefs and ways of being Māori are part of who they are and what they bring to the classroom. As stated, New Zealand is multicultural country but recognises its bicultural foundations between Pākehā/European and Māori. While approximately 15% of the population self-identifies as Māori, 95% of school-age children attend English-Medium schools. Barbara experienced a marginalising school system. According to Barbara, "*I was put in the back of the class and told if I did not speak English then I should not be here, I was five*." For her, schooling did not improve as she saw it a constant challenge to who she was and what her culture meant to her. Harry attended Kura Kaupapa (Māori medium school) where his educational experience was embedded in te reo Māori and tikanga Māori. He believes more mainstream students should have positive experiences of and with Māori.

Both Barbara and Harry wanted to teach their students about how the planet behaves (see tutorial 7, Table 1) through Te Ao Māori (the Māori worldview). In the tutorial, we explored ways to challenge what they as student teachers know about earthquakes, volcanos and tornadoes and how to bring this topic effectively into a primary classroom. As with every tutorial topic, the discussions covered how these activities could be used with all primary ages and across cultural boundaries. As Harry noted, "*For Māori, Rūaumoko [Māori god] is more than just the cause of earthquakes, you have to*

understand his whakapapa [ancestral lineage] and his familial ties to Papatūānuku [the Earth, his mother] and Ranginui [the Sky, his father].” This topic was an opportunity for Barbara and Harry to prepare three-week units of integrated curriculum, which focused on Te Ao Māori as the means to explore natural disasters. Their units of work integrated not only Literacy, Numeracy and Science but also Social Science, Technology, The Arts (to include Drama, Dance, Music and Visual Arts) and Health (see Ministry of Education, 2007). These units exposed their students to how Māori made sense of their environment. As they explained, “*our goal was to be able to plan lessons that promote holistic learning, engagement and all students’ general well-being. E ai a Kingi Pōtatau te Wherowhero “Ki te kāhore te whakakitenga, ka ngaro te iwi”” [Māori whakataukī (saying) which could be translated as ‘King Pōtatau te Wherowhero (a Māori King) once said “without vision and foresight, the Māori people will be lost”.]* For Barbara and Harry, education is the opportunity for them to challenge the beliefs, values and conceptions students have about the significance of the cultural heritage of Māori and their unique place in New Zealand.

4.2 Amy, Jenny, John and Luke

As stated, Brown and Walshaw (2014) highlighted how gender equality involved, “*accepting, negotiating or rejecting what is constantly being offered as appropriate for male and female students*” (p. 84). Gendered practices in school are a complex mixture of formal and informal educational, cultural, social and political discourses about male and female identifications. Amy, Jenny, John and Luke challenged perceptions of how females and males are identified.

In discussion about participating in this research, Amy, Jenny and Luke talked about how when they walk into a room they now expect most to form opinions about who they are based solely on their physical appearance. John acknowledged that usually did not happen in his case. Most people do not notice anything about him until he opens his mouth and starts talking. He admits his voice and mannerisms do tend to support some of the commonly held stereotypes about how gay men talk. Amy has short, cropped hair, almost never wears make-up, and has piercings in her eyebrow, nose and upper-lip. Jenny has medium length greying hair and several more lines on her face than the average university student does. Luke is a tall, large framed man with a nose that has been broken more than once and has what is commonly called ‘cauliflower ears’ after years of playing rugby.

All four of these student teachers challenge formal and informal educational, cultural, social and political discourses about male and female identifications. For all four, challenging stereotypes has been an issue throughout their ITE programme. Amy knows her choice in her physical appearance raises some concern from some schools, teachers, students and their parents. She introduces herself to her students through activities around how everyone is unique highlighting what each student has about him or her that makes him or her special. When planning her science unit she wanted to combine these activities with change of state (see tutorial 4, Table 1). For Amy a unit on the changes of state of water offered her the opportunity to build on her introduction activities, ‘What makes you special?’ while challenging what students think they know about water as a solid, liquid and gas.

John is similar to Amy in that he self-identifies with a non-normative sexuality. He is a well-dressed and presented man. John is a firm believer that the positive results of inclusion in the classroom extend into the wider communities and society as a whole. When teachers make use of inclusive practices, John feels they teach their children to be accepting and respectful of difference and diversity. John teaches to deconstruct the notion of ‘normality’ a concept that he does not believe exists and everyone is unique in his or her own right. As a teacher, John ensures that everyone is made aware they are different, may learn differently, and may require different amounts of support for different topics. As a result, his believes his students are more open to diversity as they learn to respect each other. John is firm believer in using Learning without Limits (Hart, Drummond, and McIntyre, 2006) as a means to actively include and involve all students. John used agar jelly activities (see tutorial 1, Table 1) as the focus of his unit.

In the student teachers’ course, this activity was used as a way to show why there are school rules about health and hygiene. In Māori culture is inappropriate to sit on surfaces that you eat off. As New Zealand has become a diverse multicultural country, the beliefs and values of other cultures need to be

acknowledged, such as in the Buddhist faith it is an insult to point the sole of your foot at someone while in the Islamic faith the shoe is considered unclean. John wanted his students to know and respect that what others' believe may be different but as a classroom community, they are able to respect each other. John wanted his class to understand that there are reasons why there are rules not just because they have been told it's a rule. John's students investigated why there are rules about not sitting on tables, eating food that has dropped on the ground, wearing shoes in the classroom, covering your mouth while coughing or nose while sneezing. To ensure his students understood it was the ground, desktop, or shoe that was being investigated, the week before this unit began John's students washed their hands with soap and water and wiped fingers across agar dishes that were then sealed and set aside for the weekend. Then the following week when this unit was introduced, these dishes were used to show how clean their hands were. John wanted his students to understand it was not them or anyone in the room that was 'dirty' or 'unclean' it was what they were touching. Students washed their hands after these activities to re-enforce this point. Other the next several days the student checked the agar dishes to see what was happening from each surface. John also referred back to a previous unit on Pets where students investigated what pets needed to be healthy and happy: food, water, shelter, warmth and care. As students were using desktops, John did not want anyone to worry about their desks, shoes, floor, etc. with being dirty or unclean so it was highlighted how the agar dishes provided the shelter, food and water necessary for the mould and bacteria to grow.

Jenny came into ITE at a later stage in her life than most of her cohort. She knows she looks like a grandmother because she is one. She brings to her initial teacher education programme a much more diverse and extensive set of life experiences than the typical student teacher does. For Jenny the essential needs that shape motivation, development and learning are the fundamental needs of emotional and physical safety, being in close and supportive relationships, and being connected and belonging to a community. Jenny sees her role as the teacher to build students' cognitive development in an intentional and systematic manner by engaging them in challenging and meaningful activities. Jenny saw Explosions: How and why you can set students on fire (see tutorial 10, Table 1) as the perfect opportunity to blend how to meet the fundamental needs of children in meaningful activities. Through a science unit titled, 'How amazing is water!' Jenny challenged her students to develop their self-esteem and willingness to step outside their comfort zone. Students investigated the heat absorption capabilities of water. Starting with one finger of one hand in cold water and one finger in warm water for one minute then both in the same tepid water. This then led to water balloons half-full of water and using matches to see how many it were needed to pop the balloons compared to balloons with only air. Finally, students soaked one arm (hand up to elbow) in water before taking a handful of LPG-filled bubbles in their hand and having the bubbles set alight. Jenny does not see her age as a barrier from being able to teach the curriculum in a way that resonates socially, culturally, and emotionally with her students.

Luke takes up space when he is in a room. He is physically large and looks like a rugby player because he is one. When he interviewed for admission into this ITE programme he was told he would have no trouble getting a job as a primary teacher as schools are looking for strong male teachers. For his placement in his first-year of the programme, he was assigned a Year 6 class. He admitted this was not what he wanted and this almost resulted in him pulling out of the programme. He reported that his mentor teacher treated him like a big child who could not teach the real subjects like Literacy and Numeracy. He was given the Physical Education classes as then he could take the boys for rugby. He did not want to be a rugby coach; he wanted to be a teacher. In his second-year, he was assigned a lower primary class and knows that teaching the lower primary classes is what he wants. He requested a Year 1 placement for his final-year. Year 1 is where he feels he is best at building supportive inter-personal relationships with students and creating the classroom environment that promotes positive academic attitude, values and beliefs.

Luke used the topic of gardens (see tutorial 5, Table 1) to challenge what his students think they are able to do. Specifically, he used an activity of growing 'wheat grass heads' (students put a photo of an animal on a cup, and as the wheat grass grew, it became the hair of the animal) to show his students how care and attention and thinking about one's actions lead to better results. Over the week, Luke and his students tended to their wheat grass heads talking about and discussing sunlight, when/how

much to water, temperature and handling. Central to how Luke sees his role as the teacher is through reciprocal imitation (Zhou, 2012). In this Year 1 class, Luke knew it was his actions and behaviour as a caring, responsible and effective teacher that his students imitated. This imitation offered Luke the opportunity to express his concept of 'self' as a teacher through his actions, experiences and emotions (Zhou, 2012) instead of what 'others' may expect from a rugby coach.

4.3 Mark

In almost every way, Mark is like many primary teachers in New Zealand. He is white, middle-class, and of Pākehā/European descent. To a large extent New Zealand's educational system that by law guarantees free, secular and compulsory education for New Zealand's youth aged 5 to 19 (Ministry of Education, 2015) supports Mark's cultural and socio-economical background. However, Mark has strong personal religious beliefs. As a result, he recognises and understands that some students come into education with personal belief challenges that go against *The New Zealand Curriculum*. For example, the science curriculum area promotes 'Evolution' (see Science Curriulum Levels 1 and 2, Ministry of Education, 2007). Curriculum Level 1 begins students' formal education and the topic 'Evolution' carries through the curriculum for students' entire formal schooling from Year 1 to 13. While Mark has fundamental religious beliefs that oppose 'Evolution,' he sees science as a means to provide students' with the opportunity to defend their beliefs even if they respectfully disagree with what others' believe.

One of the Key Competencies (Ministry of Education, 2007) of the curriculum is 'relating to others.' This requires students to learn to, "*listen actively, recognise different points of view, negotiate, and share ideas … how their words and actions affect others*" (Ministry of Education, 2007, p. 12). Mark modified the topic Mini-beast (see tutorial 3, Table 1) as the opportunity to challenge what students' think they believe. Specifically, he designed this unit so that his students were required to be critical in making sense of the unit's content and able to justify their opinions, beliefs, ideas and values on an array of ideas. Mark used a national symbol of New Zealand, the kiwi, as the focus for his unit. Starting with the story *How the kiwi lost its wings* (Alwyn, 2008), Mark's class investigated other beliefs about how and why animals look the way they do. Bringing in animal stories that represented the Samoan, Fijian, and Scottish ancestry of his students, his class created a wall display that showed how different cultures and belief systems have represented animals and their creation. In this way, Mark and his class were able to express their ideas, beliefs, and values in a safe and supportive environment that recognised different people have different beliefs. Mark created a unit that provided everyone in his class the opportunity to express their personalities, backgrounds, cultures and beliefs.

5. Conclusion

Our world is full of diverse individuals and therefore it is crucial that our classrooms provide an environment where everyone is safe, supported and welcomed. This is for both students and their teachers. Teachers who embrace diversity in the classroom and do not see it as a hindrance are able to build responsive, reciprocal and corroborative relationships needed to enrich each individual's education. Teachers should be encouraging difference as a means to learn from one another.

We are all unique individuals and should focus on the normalisation of difference. As such, teachers need a more sophisticated notion of normality, knowledge and learning. They should question the taken for granted assumptions about what girls and boys should do. We have the ability to go against these messages.

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