Achieving in Mathematics Contested Spaces and Voices

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A group of Māori students were identified as high achievers in mathematics in their Intermediate schools. A research project has been following this group of achievers for the last five years. This paper explores how their Māori parents view their relationship and involvement with their child's school. The voices of Māori parents and some of their offspring testify to a mismatch between the culture of the home and the culture of the school. This paper raises questions about factors that may keep these Māori students involved in mathematics study.

Unlike past and possibly present assumptions about some ethnic minority groups and lower socio-economic groups that the parents do not care about their children's education, a group of Māori parents (indigenous New Zealanders) in this longitudinal study express a strong interest in the mathematics education of their children. Some of the parents' views on their involvement and relationship with their children's school are explored in this paper.

According to Johnston (2003) the notion of 'space' can be utilised as a conceptual tool to explain how groups act and react in different contexts. If we feel comfortable in the space we are occupying this is likely because there is consonance with our beliefs, values, and practices. If there is a lack of compatibility or dissonance with what we believe in and how we expect things to be then we can do one of three things. We may accept that there are differences in the way of operating in that space and remain, we may withdraw into another space where we can operate or exist more comfortably, or we might use our agency to contest and change what is happening in the space so that we feel we belong more as an insider.

Johnston (2003) asserts that many Māori live in an Indigenous space. This is a space where Māori can belong and feel valued. Māori identity is affirmed and reinforced in this space because cultural beliefs are taken as the norm thus enabling them to feel comfortable in this space. Educational contexts operate in a colonial space, so called because dominant groups' practices, values and knowledge are deemed to be the norm. Māori (and other minority groups) become the 'other'. At the intersection where these two spaces meet there is a captured space or a space in between where "… the colonial space dominates and take[s] precedence "(Johnston, 2003, p. 53). Thus attempts to build shared space between home and school are largely unsuccessful. Whänau seldom reach across to schools from their Indigenous space. Schools decide what shall be taught and what is expected of its students, although history shows that Māori communities have not always been passive in accepting a western based curriculum Further schools either dictate the role Māori parents play or else they send home occasional newsletters that 'talk at' parents rather than invite them into their space.

There is a range of literature that testifies to the positive benefits of parental involvement in the education of their children (Alomar, 2006; Bicknell, 2006; Biddulph, Biddulph, & Biddulph, 2003; Bull, Brooking and Campbell, 2008; Lawson, 2003; Pomerantz, Morman & Litwack, 2007). This has led to a number of initiatives in New Zealand and other countries to involve parents in the education of those groups of learners who are not achieving in the system, especially parents who are seen to be 'hard to reach'.

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The discourse of parental involvement has been largely replaced since the educational reforms of the late 1980s by policies that shifted to the notion of school-community partnerships (Lawson, 2003), especially for Māori learners. The *Tomorrow's Schools* (MoE, 1988, p. 3) policy document proposed more parental and community involvement in their children's education, while the *National Administrative Guidelines* (MoE, 1999) required schools to work with 'the school's Māori community' (MoE, 1999, 1 v). *Ka Hikitia* (MoE, 2008) the Māori Education Strategy 2008-2010 highlights three elements in Māori education, the learners, parents, and professionals. Parents and whānau are deemed to play a critical role in supporting their Māori learners' education alongside the professionals.

In addition to parental involvement or partnership some researchers also argue that being inclusive of the family's cultural environment at school can have a positive effect on student achievement (Adair, 2008; Bishop, Berryman, & Richardson, 2001; Macfarlane, 2004). A belief that the learner is nested in social and cultural systems and that for an optimal learning environment there should be an interrelationship between the values, beliefs and practices in the systems aligns with Bronfrenbrenner's ecological approach (Alomar, 2006: Berryman, Walker, Reweti, O'Brien & Weiss, 2000).

Berryman et al., (2000) advocate an ecological approach for the educational success of Māori learners. They maintain it is important for schools to recognise that the cultural practices and language of many of their Māori learners' home environment differ from that of the school. In order to optimise learning for Māori there needs to be a strong connection between the values, beliefs and practices of the home and that of the school.

The building of relationships and trust between the school and home whereby space is created for teachers and whānau to share expertise and learn from each other strengthens links between the micro systems in which the learner is located (Berryman & Togo, 2007). This sharing and collaboration can improve practice and increase learner participation.

In this paper parents of high achieving Māori learners in mathematics talk about some of the unsafe spaces their children occupy at school, how their voices are silenced, and how Māori cultural ways of seeing and doing are usually marginalised in school spaces. While they endeavour to support their children in mathematics the parents feel inadequate in this role. Further they do not feel the school values any involvement they may want to engage in.

Methodology

This paper reports on a longitudinal research project that has followed a group of successful Māori students in mathematics from their Intermediate schools (year 8) through to High school where the first cohort is now in year 13. The Māori learners live in provincial centres in the North Island of New Zealand. There are about 20 students located in four High schools and since the project began over five years ago several brothers or sisters of participants also high achievers in mathematics have joined the group. The schools have over 40% Māori students on their rolls.

The aim of the project is to ascertain what might be some of the factors that keep these high achievers motivated to continue with mathematics through to university and what might be any factors that de-motivate them. We gained approval for the project from the University of Auckland Human Participants Ethics Committee. One aspect of the overall study is reported here, namely how the parents view their relationship and involvement with their child's school in relation to mathematics.

We have gathered data from questionnaires, a series of interviews with the learners, in class observations and during mathematics activity sessions outside school hours, and more recently teacher interviews. We endeavour to meet with most of the parents in the early evening once or twice a year. We have interviewed many of them in their homes, some of them several times. Names used in this paper are pseudonyms.

We have received funding from several sources to support this project entitled *Pängarau AIM* (Achieving in Maths). The University of Auckland Research Grants committee allocated us a grant and we have been supported by the University Equity Office and NZIMA. We have run a number of informal fun workshops and mathematics competitions with the Māori students. Earlier this year we invited the students and their parents to UoA for a day trip to gain a feel of university life. The students attended a stage one statistics lecture and some of them actually understood the contents of the lecture.

Although we have gained written permission from most of the parents to access their children's mathematics grades from the schools this has not always been an easy task. However a sample of the parents' or students' comments demonstrate that in Years 9-11 achievement is still high.

> She's in a streamed class where there's few Māori… she was in the maths extension class (father)

> Yeah I'm in the top stream. I find maths easy (Māori student)

When pushed to talk about their achievement in mathematics they appear shy and share with us reluctantly about their ability. In response to a questionnaire many indicated mathematics is not very difficult and that if someone was to order their class in terms of mathematics ability 'where do you think you would be?' they tended to circle 'in the top half' which was second in a scale of five responses (the top response being 'very high').

Some of the Māori learners have been described by family as self managing. Most of them have a Māori role model in their whanau or extended family who is good at mathematics. Although they don't go to them often for help they know they are there. This may be a father, uncle, older sister, or cousin who uses mathematics in their job. Most of the learners appear to have strong connections to their Māori whänau and grew up close to their marae or visited often when they were younger. They appear to be strong in a sense of their Māori heritage although many come from mixed parentage. They all have their sights on a career or profession that will use mathematics in some way. For some this is why they persevere in mathematics although as they have reached year 11 and 12 they enjoy mathematics less as it is so disconnected from their lives. Many of them also contribute to the school in other ways e.g. sport or kapa haka (action songs).

The parents are supportive of their children and encourage them with their mathematics and in education although most of them cannot help with their child's mathematics homework. When asked what kind of help or support they can offer their kids they responded

> A shoulder to lean on, unlimited love. There is nothing I can't offer him (apart from maths)

> I can support him with encouragement

They are very proud of their children's achievements and we believe that is why they readily meet with us when we go to their city as they are so thrilled someone is recognising their children's positive achievements. The parents are largely blue or white colour workers. Some are in training with a tertiary provider or trainers themselves. They

critically discuss the disconnections between home and school although they do not entirely criticise the school their child attends. Some of them are not afraid to approach the school if they feel they have a genuine concern but the school's responses are varied as some of the stories will attest. One of the parents Nane believed that many Māori parents don't seem aware of their rights and they don't have an understanding that you can go to school, be assertive and say "I want this for my kid" if you have any concerns about your child's education.

In the next section parents and sometimes the Māori learners share their stories about schooling practices and their relationship with the schools and some concerns they have.

Whānau Stories

Unsafe spaces – marginalizing cultural ways

One of the parents, Davina, related her daughter's being taken to the school on a half day visit prior to graduating from Kohanga Reo where it is standard practice to welcome or powhiri newcomers and visitors. The head teacher 'just kind of left the kids' in the classroom in which they were to spend their time. Later when she actually began school Davina's daughter 'wouldn't start and she wouldn't go back' into the school. She talked to her mother about her earlier experience of not being welcomed, being left at the door of the class and not being connected to the people in anyway or knowing the routine in which she was entering. Even in non-Māori contexts "you are welcomed into a house. You just don't throw yourself into someone's house and make yourself at home, which is kind of what the teacher expected," said Davina.

Although from her primary school years this is an important example of conflicting practices between home and school and how Māori students are often made to feel unwelcome and uncomfortable in the school's learning environment. Similar practices appear in High school. Students withdraw into their Indigenous space and resist an engagement with the school, as do the parents.

Russell spoke about the positive aspects of his daughter attending a bilingual class in Intermediate and being with a Māori teacher who "was known for working with talented kids, she's very, very good." He said that he prepared his daughter for going to the High School "because we knew … it was going to be a culture clash for her in terms of coming out of all Māori [bilingual class]." In a sense he was preparing her for moving from an Indigenous space to what could be deemed a colonial space at the High school.

> If schools are to promote every child's full participation and success in school contexts, then it is crucial that the dominant culture stops marginalizing minority cultures (Berryman et al., 2000, p. 37).

Most if not all of the parents were able to relate racist incidents occurring at the schools that involved their child or children feeling unsafe. Some of these involved students talking back to or marginalizing each other. Terry related how one day at dinner their family were talking about a racist incident involving one of the teachers. Another sister who is ten years older and had recently returned from Australia was listening to the interchange and exclaimed' "My God is she still there? Still doing that! So its intergenerational!"

Olwyn related experiences about attending tangi as an example of racism.

> Oh yeah, that tangi thing. They [schools/teachers] always do that. 'oh you have too much time off school going to everyone's tangis.' It's not our fault people die in our family. And they [teachers] don't help you. They don't help you catch up either.

Terry related a long story about his and his daughter's encounter with the school when they went to complain about a teacher's racism. Another father had a similar story to tell when he approached the school about a matter he was concerned about at another time. Both families contested the process as they felt dissonance with their values and practices. Now they are more inclined to remain in their Indigenous space than try and penetrate the schools' colonial spaces.

Captured Spaces

Although some parents suggested that some schools try to incorporate Indigenous Māori culture into the school more often than not it is done without collaborating or involving parents. Where Māori things are done in schools they are captured and redefined by the school and more often results in tokenism. For example Olwyn's dad Terry recalled the school building their whare nui (meeting house) ten years earlier when his older children attended the school.

> They built a whare. The principal at the time was more concerned about design and cost and he loved to put price tags on it but he wasn't big on consultation… Consequently there were always disputes over it [… we were in a Māori Parents' Support Group at the time]. Do they actually use it as a whare now? It had carvings.
>
> *(Olwyn)* Yes its got carvings and stuff. They use it like a classroom. They don't even use it as a whare.

According to Terry the whare "doesn't really follow design tradition." Olwyn went on to say that "it's a classroom pretty much with carvings on the front". This is an example of the dominant group redefining and renaming a Māori Indigenous space. Olwyn said the school does attempt to incorporate Māori things into the school like greeting important people (e.g. ERO) and overseas visitors with a powhiri but "they don't go into the whare, they go into the hall." ERO (Education Review Office) came in and the school "had a big powhiri for that and made it [Māori things] look real."

Disadvantaged/Disconnected spaces

A number of the Māori students and their families talked about the positive contributions they made to the school over and above their academic contribution. These revealed a tension whereby on the one hand Māori kids were lauded by the school and on the other hand they were disadvantaged. Terry noted that Māori students were sometimes pulled out of class "to do a powhiri". His daughter Olwyn retorted "Yeah, then you get behind in class and the teachers won't help you again."

One parent stated that his daughter Queenie was good at sport "Māori can be good at sport so they get to play sports [for the school] but then there's a grizzle about why you are always away from class and you could be playing sport for the school." The younger sister asserted, "They automatically think you're bunking off class." Their mother added "they don't mind you taking the credit if you come somewhere at sport."

Zara felt disadvantaged at times in class because 'the teacher thinks you're really smart and when you ask for help she starts with the people she thinks aren't smart."

Reaching Across the Spaces

Zara's mother shared that she thinks there is "too much talk at school and not enough action". She talked about approaching the school at parent interviews and raising an issue and although the school was approachable "I got no feedback". The school does attempt to send newsletters every six weeks or so and she did get a letter once congratulating her daughter on attendance. It appears that the communication is one way and there is little attempt to connect one to the other, almost a 'talking past each other'.

Queenie's father shared an incident when he approached the school. "We complained about a teacher who rutted off at the class telling them they were all idiots and lost the plot." Queenie was put in the middle and several teachers in a half circle. "Reduced her to tears. … I've been reluctant to raise issues like that if they're going to put [her] on the spot." Looking back he realised he should have moved his chair and sat beside Queenie.

Discussion

These whānau stories are only a sample taken from our interviews. Although some schools have endeavoured to reach across the spaces they have done so in a way that is top down and usually excludes or silences the voice of parents. In attempting to be inclusive of some things Māori they have co-opted and redefined Māori. "School holds much of the power and the emphasis is on getting parents to collaborate with school activities" (Bull et al., 2008, p. 59). It is suggested that although there are some school practices that are aimed at getting parents into schools these might be modified to better encourage parental engagement.

> Sadly, in many mainstream schools when educational decisions about Māori students are being made, families often are not at the table and, more importantly, nor have they been invited" (Berryman & Togo, 2007, p. 50).

Building connections between the systems or spaces will take time for both groups to talk and both groups to listen. Parent/whānau voice needs to be invited to the table at the development phase of initiatives so that there is a shared space rather than a captured space. Schools do attempt to make some communication with parents but this does not seem to be on any consistent basis, and as one the Māori learners said 'we don't always give the newsletter to mum and dad". Some schools have begun to email parents but working class parents tend either not be connected to email or do not open it regularly. Initial contact with Māori parents is best on one to one basis, the importance of kanohi ki te kanohi (face to face) cannot be underestimated.

It is not clear what the schools expect of parents. It could be as Bull et al., (2008) suggest that they want parents to do more school-like activities with their children at home. While generally Māori parents believe they are not able to support their children with their mathematics at home they do consider that the school can change some of their practices to incorporate those that are conducive to engaging Māori learners. What is needed is a two way connection between homes and the schools so that parents and school are working together creating something different from what they currently do in a space that should be shared rather than captured. Schools and whānau gain mutual benefits when aspirations for their Māori learners are consistent and complementary but if minority voices are to be heard and valued they must come from a cultural base.

Whatever partnership programmes or home-school learning initiatives are introduced teachers need to be supported in making connections with parents (Lawson, 2003) and with being clear about the purpose of the partnership (Bull et al., 2008). A tension arises when

teachers perceive it is not part of their professional role to make links with parents and nor do they have the time with their all the other requirements of them. This point was commented on by a parent, "Staff appear interested in developing parent relations but they have high stress and high workloads."

Specific mathematics examples are thin throughout the parent interviews, rather they tend to focus on the generic learning environment even though they know our research is focussing on mathematics. The fact that they talk so little about mathematics learning tends to reinforce the reality that they do see themselves marginalised from the school particularly in relation to mathematics.

Conclusions

The literature is strong in its claims that parental involvement or partnerships and an ecological approach will optimise environments for learners particularly Māori. However Māori parents' voices testify there is often a mismatch between the culture of their home and the culture of the school. Although educational policies require schools to work with their Māori communities, and policies acknowledge the importance for Māori learners of a three-way relationship between learners, parents, and professionals this study of selected schools suggests that schools have priorities other than parental involvement or school home partnerships. Whānau feel their involvement is not particularly wanted or welcomed by the school.

Notwithstanding the above, Māori learners in this study are reasonably confident in their mathematics and generally comfortable with their Māori identity. These Māori learners are highly successful and, at this point four to five years on, are still participating in mathematics classes. Their parents encourage them in their education and want them to achieve in mathematics well beyond school. These Māori youth are being encouraged to go to university and study mathematics although parents recognise this will mean they will likely have to leave home to do so.

It could be said then that the Māori participants in our project are successful at mathematics despite their schooling environment. Why have these particular students persisted with mathematics? Is it because they are self managers? It is because they are strong in their identity, their sense of who they are? Does that give them self efficacy for mathematics? Does the support of their whānau and having a Māori role model who is good at mathematics make a positive difference?

We are left with many questions in this ongoing study. One of the biggest questions we are grappling with but have no answers concerns Māori who are not achieving or participating in mathematics. If schools opened up spaces at the intersection of home and school and worked collaboratively with parents and whānau as stated in the policies would more Māori non achievers in mathematics increase their participation and success? Will involving whānau in collaborative and shared power relationships that is inclusive of a Māori worldview provide "an empowering base from which to operate" and contribute to greater achievement of Māori learners in education particularly mathematics (Berryman et al., 2000, p. 38)? Until schools are willing and resourced to work in genuinely collaborative ways we can only guess at the answers.

References

Adair, J. K. (2008). Everywhere in life there are numbers: Questions for social justice educators in maths and everywhere else. *Journal of Teacher Education, 59* (5), 8.

Alomar, B., O. (2006). Personal and family paths to pupil achievement. *Social Behaviour and Personality.*

Downloaded from http://findarticles.com/p/articles/mi_qa3852/is_200601/ai_n17186...
Berryman, M., Walker, R., Reweti, M., O'Brien, K., & Weiss, S. (2000). An ecological approach to understanding behaviour: Comprehensive and culturally appropriate strategies towards student success. *SET, 2*, 35-38.
Berryman, M., & Togo, T. (2007). Culturally responsive whanau relations for including Māori students in education. *Kairaranga*, 8 (2), 7.
Bicknell, B. (2006). *Investigating parental roles of mathematically gifted students (pp. 76-83).* Paper presented at the MERGA 29 Conference, Canberra, Australia.
Biddulph, F., Biddulph, J., & Biddulph, C. (2003). *The complexity of community and family influences on children's achievement in New Zealand.* Report to the Ministry of Education. Wellington, NZ: Ministry of Education.
Bishop, R., Berryman, M., & Richardson, C. (2001). *Te toi huarewa: Effective teaching and learning strategies.* Final Report to the MOE. Wellington, NZ: Research Division, Ministry of Education
Bull, A., K. Brooking, & Campbell, R. (2008). *Successful home-school partnerships.* NZCER, Wellington, NZ, Report to the Ministry of Education.
Johnston, P. M. G. (2002). Disrupting/contesting/creating space: challenging students to think Māori education. *Delta, 55* (1/2), 43-60.
Lawson, M. A. (2003). School-Family relations In context: Parent and teacher perceptions of parent involvement. *Urban Education, 38* (1), 77-133.
Macfarlane, A. H. (2004). *Kia hiwa ra! Listen to culture.* Wellington, NZ: NZCER.
Ministry of Education (1988). *Tomorrow's Schools The reform of education administration in New Zealand*. Wellington, NZ.
Ministry of Education (1999). *The national education guidelines.* Wellington, NZ, Ministry of Education.
Ministry of Education (2008). *Ka hikitia Managing for success Māori education strategy.* Wellington, NZ, Group Māori, Ministry of Education.
Pomerantz, E. M., Moorman, E. A., & Litwack, S. D. (2007). How, whom, and why of parents' involvement in children's academic lives: More is not always better. *Review of Educational Research, 77(3),* 373-410.