Tensions and Possibilities: Indigenous Parents Doing Mathematics Curriculum Development

Tamsin Meaney
University of Otago
< tamsin.meaney@stonebow.otago.ac.nz >

Uenuku Fairhall
Te Kura O Te Koutu
<ue@wave.co.nz>

This paper investigates tensions faced by indigenous parents in developing a mathematics curriculum. These included an uncertainty about their role in regard to their contribution and what they could gain from being involved. We suggest that a community, which exists because their children attend a school, needs to have opportunities for shared activities first. These can be used as starting points for curriculum discussions so that the tensions can be alleviated and the possibilities taken advantage of more fully.

He kokonga whare e kitea,
He kokonga whare e kore e kitea.

When this research began, it was expected that it would report on the process used by indigenous parents and teachers to develop a mathematics curriculum. Instead, it became a discussion of the problems faced during the process. As the Mäori proverb at the start of this paper states, although a corner of a house can be seen, the corners of a heart cannot. Research which involves people rarely results in the outcomes that are anticipated because of the complexity of human nature. This paper reflects on what was learnt by the authors from their positions as facilitator and participant in the curriculum development process. In many ways this paper should be considered as the culmination of the dialogues which occurred before, during and after this project on the complexities of what was being undertaken. It, therefore, provides not only a description of what happened but also makes suggestions for how such a project could be improved by other indigenous communities in the future.

Parents' Involvement in Curriculum Development

The role of parents within the curriculum development process has not always been considered essential. With the recognition that most mathematics curriculums have favoured the background and experiences of boys who were middle class and Anglo-Celtic in background (Australian Education Council, 1991, p. 9) has come suggestions that mathematics curriculums should be altered. Curriculum development projects have often included teachers and their beliefs about parents' expectations of schooling have been thought to inhibit decision making (Murtadha-Watts & D'Ambrosio, 1997, p. 776). However, this has rarely resulted in an increased involvement by parents. Instead, parents' contributions to schools are usually limited to supporting existing school programmes. For example, Weiss and Edwards (1992, p. 215) stated that '[r]esearch over the past 15 years demonstrated that when parents are involved in their children's education, these children have higher educational achievement, better attendance records, and more positive attitudes about education'. They discussed the need for parents and the school to hold 'common sets of beliefs, expectations, values, and meanings about achieving a quality education for all the

children', but in the research described there were no opportunities to negotiate these beliefs, expectations, values and meanings (Weiss & Edwards, 1992, p. 222). In another study, five areas of parental involvement in school activities were outlined (Swap, 1992, p. 67-76). None of these had parents contributing to curriculum development. Although the role of governance and advocacy did involve parents in decision making, this was only in regard to the administrative functions of the school. Christenson, Rounds & Franklin (1992, p. 33) cited a research project by Chavkin and Williams (1985) which interviewed over three thousand parents. Seventy-four percent of parents were interested in participating in decision-making roles in schools but only twenty-one percent were actually involved in such roles.

On the other hand, it has also been advocated that for under-achieving groups within a society to improve their situations, there is a need for the school curriculum to be made culturally compatible and this can only be done with parental and community involvement (Cantoni, 1991, p. 33). This is particularly pertinent to indigenous communities where there are significant cultural differences with the traditional Western culture of schooling.

> Cultural negotiation is a process that makes schools' hidden values and processes visible to community and school while making the community's knowledge, values, and processes visible to schooling. Schooling then becomes explicit and open to choices - choices that can only be responded to at the local community level as they concern issues of culture, language, and identity. Through an exploration of their own cultural strengths and their particular goals and visions for their children, community and school can construct a curriculum of the possible - creatively devising content and pedagogy. (Lipka, 1994 p. 27)

The mathematics curriculum - as an expression of the dynamic educational relationship between society, the schooling system, the community and the child - provides the guidelines for how that subject is viewed within the schooling process. From their own experiences, community members are aware of how their mathematics education contributed to their situations and they have clear expectations for their children and for their community as a whole. This knowledge can help expose and change the contribution that mathematics education makes to the marginalising of some students and their communities. Curriculums written at a community level can reflect the needs of that community within a wider society, but their main advantage is that they reflect the differences rather than the similarities with other groups within that society (Cantoni, 1991, p. 33).

In Mäori immersion schools (kura kaupapa Mäori), the philosophy document *Te Aho Matua* (Kura Kaupapa Mäori, 1989) proscribes that there will be parental involvement in the decision making which occurs within the school.

> Kia kite ngä tamariki ko Te Whänau tonu e whakahaere ana i te kura, ko Te Whänau hoki e mahi ngätahi ana me ngä pouako, ka tupu ia me te möhio ko te wairua me te mana Mäori motuhake e käkahu ana i a ia me töna kura. (Te Aho Matua 3.8)
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> Ehara i te mea mö ngä tamariki anake te kura. He mätauranga anö kei te kura mö ngä taipakeke, mo te katoa o Te Whänau hoki mehemea ka hiahia whakatü wänanga rätou mö rätou.
>
> (Te Aho Matua 3.9)

It states that the whänau [extended family or school community] will run the school so that children will grow in the knowledge that the spirit and the prestige of innate Mäoriness is enveloping them and their school. School is not just for children but should allow

parents and other whänau to initiate learning opportunities for themselves. *Te Aho Matua* also states that the child's own home is their first school, intimating that school should be homelike with a shared culture and values. It is up to kura kaupapa Mäori to lead them. It is stimulating for the children if adults stay alongside them in school to support their work without taking it over.

It was within this setting of kura kaupapa Mäori and the researcher's commitment to the need to realign the mathematics curriculum that this project was set (see Meaney, 2001 for a description of the entire project results). This paper reports on how Mäori parents whose children attended a kura kaupapa Mäori felt about being involved in a mathematics curriculum development project. It became an issue worth investigating as it was obvious that parental involvement as suggested by Cantoni (1991) and Lipka (1994) was not a simple thing to achieve.

Participants

The kura kaupapa Mäori is in a provincial town in New Zealand. The parents had placed their children in this school so that amongst other things they would learn in the Mäori language. Not all the parents were fluent Mäori speakers. Students who did not have Mäori as their first language had had some exposure and knowledge of the language, usually through attendance at kohanga reo [Mäori pre-school]. The parents and teachers who were part of this research saw themselves as a school community because of their overwhelming desire to do their best for their children. In making a choice to move their children into a kura kaupapa Mäori, parents could be said to have jointly rejected mainstream schooling for their children. All the teachers also had children attending the school. Although some parents shared some outside-school activities, many parents would not encounter other community members except at school functions.

The school was a primary school but during the second year of the project, the school received permission to expand into secondary programmes. The school, however, remained a small school, having only four classes.

Gathering Data

Over the period 1998-1999, the community held nine meetings on different aspects of mathematics curriculum. These were usually held on Sunday afternoons and took between two to five hours. All meetings were tape-recorded and transcribed. In the following sections, excerpts from meetings are given with meeting date and the page number from the transcript.

As well, interviews were held with parents and teachers throughout the course of the project. Although it had originally been envisioned that the same people would be interviewed throughout the project, this did not eventuate. Over the course of the project, 12 different people were interviewed. No interview took longer than an hour. As with meeting excerpts, interview excerpts are given with the parent (P) or teacher (T) number, date and transcript page number.

Results

From the initial interviews, it became clear that parents participation was not a simple issue as many parents were unclear about why they were attending meeting on mathematics. As the project continued, parental involvement declined significantly so that by the final meetings in 1999, only a few parents were attending regularly. As well, although the project had presumed that parents would be willing and able to contribute, discussions were often based around ideas suggested by teachers. In the interviews a number of uncertainties arose about what parents felt their role was and what they could contribute which would be as valuable as those of the teachers. This contrasted with teachers' beliefs that the parents did have something to contribute about mathematics and curriculum development. This tension can be seen in the first two answers in the initial interview with one parent. (All extracts have been edited to improve clarity.)

> I: What would you see as a role for a curriculum in a school? What sort of thing do you think you'll be developing at this point?
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> P2: Realistic applications of things our kids need to learn as opposed to things that are probably irrelevant to our children's lifestyles ... One good example I have is of where my daughter went to a country school in the middle of nowhere and where they have normal electives like metal work, wood work and things like that, her electives were making an hinaki which is something that you catch eels with and also cutting up a cow, killing a cow and cutting it up. That's what was useful for them in their area. Because that was the lifestyle that they lived in at the time and plus they had no metal work facilities anyway. So things that are useful for our children.
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> I: That's related to the next question which is why do you want to rewrite the maths curriculum? Is there something about it at the moment that you're uncertain about or something that you as a community want to talk about more, you don't just want to accept?
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> P2: I don't know the difference [with the mainstream mathematics curriculum] so I can't comment on that. All I know is that our headmaster, I'm quite confident that he knows that he's doing the best for our children. So I'm going to support this new framework idea. I have absolutely no idea what to compare it with because my children have never been to a mainstream school (P2, 23/8/98, p. 1).

From the first answer it can be seen that this parent had experiences which would make a valuable contribution to the curriculum development process, yet valued more that the principal felt the curriculum development process was useful for the children. Some community members also had knowledge of traditional activities. At the beginning of the second meeting, parents did a fish filleting activity which came from mathematics education work done by Yup'ik people from Alaska. As a result of this activity, one parent said

> P7: It was something that I know and I've known from childhood, but to realise that you can connect it to a classroom exercise, it was just wow, it was neat, it was really neat (P7, 2/12/98, p. 2).

It is quite possible that like the Mäori women in McMurchy-Pilkington's study (1998, p. 109), the parents in this project did not value their skills and knowledge as being related to what was considered mathematics at school.

Especially initially, parents believed that it was essential that they participated in the curriculum development process, even if they were uncertain what they were going to be doing. A number of reasons were given for why they believed that their involvement was important. Some parents felt that they did have something to contribute.

I: What expertise does your community members have that would contribute to writing a maths curriculum?

P9: I think an awful lot can be achieved from just life experiences. Everybody's life experiences are some sort of help towards it. ... I never involved myself in maths since I was growing up, but my life experiences are enough for me to help the next parent or the next child to say let's do it this way. Let's get out and into nature and we'll do it this way. And we'll just see it just as clear as being inside with the blackboard and the pen (P9, 8/11/98, p. 6).

Others felt that in order for their children's chances of achieving to be improved, they needed to be involved.

P1: Just speaking from myself the advantages that we are getting [from being involved in the project] are that we can start owning things. We can be in touch with it and then we can start when our kids come back [home]. We are familiar with the contexts, we are familiar with their work and then we can ask them not intelligently, but we can ask them without fear of the maths, so we don't say go away I'm busy. (P1, 8/11/98, p. 3).

P5: ... if being here with you is going to help our children then that means parent commitment and that means all parents (P5, 20/6/99, p4)

For some parents, there was a fear that they had little understanding of mathematics and this would severely affect what they were able to contribute. This was in contrast to what the teachers felt the parents could contribute to the process.

T1: The parents, I think they need to know what's happening in the curriculum, need to know about it... Whereas I think the Family Maths nights that we've already planned are ...

T2: I had one or two mums saying I don't know too much about maths so it's not worth me coming

T1: But that's who you are trying to encourage, but that's where those

T3: This isn't about being mathematical at all. (M7, 15/8/99, p. 72).

As staff were hired by the school community, parents believed that they could leave decisions about what went on in the classrooms to the teachers and this included decisions about the mathematics curriculum.

P8: ... the teachers are the experts so I leave them to teach. When my daughter brings her homework home that's when I ... have a look at her work and where she's going. So I haven't got a problem at the moment ... the teaching side, that must be right, because what my daughter is bringing home and what she's doing for her homework, she knows exactly what she's doing. So ... the only reason why I'm not really having any input is because I'm happy with the way my daughters progressing with her maths. (P8, 20/6/99, p. 2).

However, by the end of the project, those parents who did participate felt that they had learnt about mathematics and this in turn had an impact on their children.

I: Is it better just to leave it to the teachers?

P8: I don't know how the other parents feel but like I was saying at the beginning it seems to be a bit over my head, so for me personally I'm quite happy to leave it with the teachers. ... I say it's been an awareness by being given that booklet to read and having a look at the different types of maths. I think you take it for granted. We think of maths as being at school and in the classroom, not really realising that maths is every part of our day and what we do.

I: Has that changed looking at things with you daughter at home?

> P8: Yes, yes it has with both my children. ... You know the way we look at things ... We go home and we could be doing a game or anything like that and I'm aware that this is actually maths and this is what I tell the children (P8, 20/6/99, p. 3).

Another parent who attended many of the meetings had begun the project with a focus on homework and mathematics as basic facts. By the end of the meetings, her focus had changed as she tried to integrate what was trying to be achieved in the meetings and her own work as a nurse educator.

> P3: ... so, mathematics is actually part of that whole development of science. In that we can actually take it out of activities that are part of everyday life and which is part of a whole and we can study smaller and smaller degrees of the whole. Sort of like, when we look at our body and our health and that whole scientific metaphor is getting smaller and smaller and smaller. We go from community to community from person to person from cell to atom and chemical and we get smaller and smaller. It's all distinctive from the whole. Maths is that same approach, it's very, very culturally Western European. I don't know whether you could, it's just a thought, is it appropriate to extract something from the whole and then study it in a holistic manner [as is done in Polynesian cultures]? (M9, 29/11/99, p. 14).

Another issue for the whole project was that of time. There were many demands made by the school with parents and teachers often expected to attend school meetings several times a week (T3, 25/7/99, p2). Parents therefore had to limit what they attended. This also affected what could be done between meetings. Although jobs were allocated for between meetings, when the next meeting arrived, often nothing had been done. For example, on occasions, suggestions were made about bringing in outsiders to talk about particular issues but this never eventuated because the organisational time needed for this was more than what was available.

Discussion and Suggestions

Many parents began with a strong commitment to the project because they felt it would benefit their children. However, as time went on, this was not enough to ensure that parents continued attending meetings and some failed to attend any in 1999. Although interviews were not held with parents who stopped attending meetings, the authors believe that the uncertainties that parents felt overcame their desire to be involved. These uncertainties included not knowing: what was involved in curriculum development; what their role was as compared to that of the teachers in the process; and what they had to contribute when they had not done well themselves in mathematics at school. These uncertainties remained even when parents felt that they had gained from being involved.

Deketelaere and Kelchtermans (1996, p. 75) suggested that time must be given at the beginning of the curriculum development process, so that all participants are able 'to talk, exchange, discuss and argue in order to get a shared platform that can operate as a basis for the actual development work'. However, it would seem that this developing of a shared platform cannot occur just as a result of discussion. Discussion in school settings such as in this project emphasised the value of teacher knowledge and the roles of parents and teachers are, initially, too obviously delineated. Although it had originally been felt that parents' own schooling would be an asset to the curriculum development process as parents would be aware of how it had contributed to their alienation at school, in fact perceptions of schooling restricted what parents felt confident to contribute. The mathematics became frozen within outside-school activities as the parents failed to value

them as potential avenues for passing on traditional knowledge and making connections to school subjects such as mathematics.

Anderson (1998, p. 580-581) described a similar situation in participatory educational reforms with parents not wanting to be involved in curriculum meetings because their views would not have the same status as those of teachers. He believed that parents who were the least comfortable in a school were the least likely to attend meetings. In addition, he described two studies where 'participatory groups meant to foster dialogue end up producing a professional monologue that results in a "parody of collaboration"'.

The authors feel that the difficulties faced by this project should not be considered as reasons for abandoning community-negotiated curriculum development. Rather they consider that the process needs to begin much earlier, allowing time for the accumulation of a corpus of shared interactions. This will enable parents and teachers to participate more confidently in the negotiation about the curriculum. This would be particularly useful in situations, such as the one described in this research, where the school 'community' is a collection of relatively independent subgroups that do not participate together in activities outside of school. Opportunities in which the distinctions between parents and teachers are blurred need to be made available so that informal discussions can occur about activities and the mathematics that they involve. For these discussions to be valid, however, there needs to be a common understanding by whänau [extended school community] and teachers that the relationship between school and home is to be symbiotic. Once this is agreed to then a discussion about mathematics would not appear inappropriate when parents are setting up an activity such as the smoking of recently-caught fish on the lake's shore. These discussions should not concentrate on just mathematics but rather on the entire curriculum range as they arise. The discussion becomes one between partners who are working together for the interests of the children.

Before the process begins, a school's mathematics programme needs to be up and running to allow the school community time to establish the shared responsibility for the children's education. The process begins with careful planning of whänau activities that could engender ideas for educational programmes. Teachers have a professional responsibility in developing this dialogue. As they can be expected to have greater appreciation of the mathematical possibilities they have to be very careful how they elicit those ideas. They need to downplay, without discounting, the distinction between themselves and parents so that parents can recognise and value their own knowledge and opinions. In many cases, it may not be necessary to plan extra activities and, further impinge of precious time, but rather to capitalise on activities already in place. Mathematics would not be the only subject area discussed, but by considering other subjects, it is suggested that their relationship to activities could result in ideas being raised about mathematics as well. The corollary of this is that mathematics per se will profit from ongoing discussion about curriculum possibilities, once it has become an established whänau expectation.

It is unlikely that time and logistics would permit, a third party, such as the facilitator in this project, to act as a referee. Therefore, a protocol would need to be established to ensure that a balance between the needs of teachers and parents is respected.

Teachers need to recognise that it is only in an environment in which parents and other whānau are comfortable that fruitful discussions about mathematics will involve, or even be initiated by, parental knowledge and opinions. This is in contrast to meetings set up specifically to discuss mathematics which start from teacher knowledge. It is anticipated that this would ease many of the tensions experienced by parents in this project and capitalise on the possibilities that both teachers and parents could see for having parents involved in mathematics curriculum development.

Conclusion

If parental involvement in mathematics curriculum development is considered a worthwhile goal, then the issue of how to gain and maintain participation is something which cannot be ignored. The tensions described in this paper are not easily resolvable. However, the aims for having parent participation are not invalidated by these tensions, as parents and teachers reinforced its need. By being aware of these difficulties, it is possible to instigate strategies such as the one suggested whereby parents are comfortable expressing their own knowledge and opinions and how these can be incorporated into a mathematics curriculum. The authors recommend that further research be carried out so that alternative strategies can be examined and the results circulated. It is worth noting that this may not occur unless support to write up what occurs can be provided to these school communities.

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