Effective teaching strategies for Māori students in an English-medium Numeracy Classroom

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Ma te tuakana ka totika te teina,
Ma te teina ka totika te tuakana.
From the older sibling, the younger one learns the right way to do things.
From the younger sibling, the older one learns to be tolerant.

This paper focuses on groups as a pedagogical strategy. The teacher sets up a "lead group" to mediate the learning of other groups. From a socio-cultural perspective, the teacher appropriates the contributions of a lead group to advance the understanding of other groups. Using a group to mediate other groups' learning appears to be an important difference to the ways in which groups have been typically used for instructional purposes in mathematics.

It is important that we understand critical aspects of teachers' actions that best support Māori student learning. Bishop, Berryman, Tiakiwai, and Richardson (2003) challenge us to examine dominant teacher-centred "monocultural pedagogies developed in New Zealand on the basis of unchallenged metaphors" (p. 23). They suggest "we need a pedagogy that is holistic, flexible and complex, which will allow children to present their multiplicities and complexities and their individual and collective diversities" (p. 13).

The category "Māori" may be unhelpful to teachers as it suggests Māori as a homogeneous rather than a diverse category (Bishop et al., 2003; McKinley, Stewart, & Richards, 2004). This leads teachers to consider simplistic pedagogical strategies such as the use of Māori contexts and "Māori learning styles" (McKinley et al., 2004). What follows is intended to unpack the common practice of group work in order to expose the complexities surrounding its definition as well as its use for instruction in mathematics.

Background

Recent studies investigating Māori in English-medium schools have focused on secondary schools (Bishop et al., 2003) and primary schools across all subjects (Tuuta et al., 2004). The literacy intervention in decile 1 schools, *Picking up the Pace* (Phillips, McNaughton, & MacDonald, 2001) reported on changes to pedagogy that resulted in improved outcomes for Māori and Pasifika students. An earlier study into Māori pedagogies was undertaken in 1996 (Hohepa, McNaughton, & Jenkins, 1996). While this is encouraging, the literature on effective teaching highlights the importance of subject and pedagogical content knowledge, suggesting that investigations into pedagogy should be discipline-specific (Alton-Lee, 2003). To date, there has been little investigation into classroom pedagogy in numeracy for Māori in English-medium schools.

Raised student achievement and improved teacher practice have been reported in evaluations of the Early and Advanced Numeracy Projects (Higgins, 2001, 2002, 2003, 2004; Thomas, Tagg, & Ward, 2003, 2004; Thomas & Ward, 2001, 2002). While this progress is irrespective of decile rankings and ethnicity, students in lower decile schools and Māori and Pasifika students have made lower gains in numeracy than students in other groups. This mirrors the trend across the school system for Māori and Pasifika students (Alton-Lee, 2003). There are, however, some schools with high Māori student populations and with low-decile rankings in which Māori students' achievement in numeracy is above that for Māori students as a whole group. More work is needed on investigating the reasons behind these results and identifying ways of reversing the overall trend in future years.

In the Numeracy Development Project (NDP), the Number Framework and its associated diagnostic interview provide a structure for teacher practice by enabling teachers to identify student knowledge and strategy stage. This information is then used to group students for instruction. Typical practice is for teachers to work specifically with a group of students to develop knowledge and strategies at their stage on the framework. The role of the teacher when working with a group has been informed by Fraivillig, Murphy, & Fuson's (1999) model, in which emphasis is given to eliciting, supporting, and extending concepts in response to students' actions and explanations.

To examine the practice of group work in more depth, it is necessary to identify the underlying assumptions shaped by different theoretical orientations. There appears to be confusion about group work in New Zealand teacher-support documents (Higgins, 1998). For instance, several theoretical frames underpin suggestions about group work. These include those reflecting a child-centred approach, those reflecting the co-operative learning movement, and those from a socio-cultural approach. Further, the purpose of group work ranges from its use as a management tool to its use as a tool for instruction.

A socio-cultural perspective is helpful to understanding group work. The inquiry-based approach to group work of the NDP is aligned with Bishop et al.'s (2003) description of discursive classrooms in which power-sharing interactions between teachers and students are promoted, where the culture of the child rather than the culture of the teacher are central to interactions, where learners are taught to critically reflect on their own learning, and where there is active engagement of students. The rest of the paper reports a case study in which groups were conceptualised as tools of instruction for Māori students in English-medium classrooms.

The Waka Metaphor for Classroom Group Work

Fundamental to the effective strategies in the case study classroom was the way in which the teacher conceptualised and used groups as an instructional tool. This appeared to be an important difference to the ways in which groups are typically used for instruction in numeracy classrooms. In this study, the teacher saw the class as a collective of interconnected groups rather than as a collection of separate instructional groups. The teacher described this as thinking about the class as a waka. She elaborated on her "waka" metaphor by explaining that it is about "groups within a group". She was thinking about all the groups simultaneously rather than focusing exclusively on the group with which she happened to be working at that time. From her comments below, she appeared to be concerned with the dynamic between the groups.

> It's regarding everybody … yeah. I mean the waka is the focus of its own. It's always within the group [the class], it's never you people are doing this and you guys just go away … you know … I do make them go away, but come back and see what these guys doing … how they're doing it. It's always involved … I mean everyone knows what everyone else is doing, that's … you know … that's a whānau thing.

In the following excerpt, she talked about "building up the lead group" as the starting point of the co-construction of understanding, that is, that "knowing" and understanding of learning can be "passed on".

> That's the one key strategy that I've learnt … is building up that lead group. That is the key to it … because they set the model for thinking … They become the leaders.

The key point is that this teacher was not just thinking of the expert as an individual but the expert as being a collective – the group as a whole.

> I could have one group … helping out another group, so you can expand it … not just a one-on-one … That's a concept that Māori students are comfortable with … They understand that it's my responsibility to help someone … Tuakana teina is because of age, but maths is because of knowledge and strategy. So it's a responsibility thing … They're quite happy to take it on and they like it because from the learner, the less able learner, I mean they get a new version of it.

In this class, the "lead group" became a tool of instruction not only for the teacher but potentially also for the students. One might think of this as a co-construction dynamic by which the class's understanding of mathematical ideas is shared.

> Even though they accumulate knowledge for themselves, it's never "I learnt this", it's "we learnt this", "we had a good day at maths" … So I regard the class in doing maths as being all on the same waka, but they don't have the same skills. Some of them are not paddlers, and I'll actually say this to the kids because they like to see analogies, they can see that it brings them all together and we all help each other to get to the end.

Working with the Groups as Tools of Instruction

The establishment of classroom norms is critical to using groups as tools of instruction. The next section of this paper identifies some of the ways in which this teacher set up the learning environment so that she could use the groups in this way. The teacher saw her role as having responsibility for the classroom learning environment.

> In the Māori sense I sort of see it as this little koru growing … part of a whole tree, some are further ahead and shelter the winds … but they are part of the whole … Very much a tool that I have is the kids themselves and … they're all growing with maths and they emerge in different ways. Some kids help others emerge better than I would, although I create the environment for that to happen … I create this common language for the kids.

It is important for the teacher to ensure that the students understand her strategy by being explicit about their role.

> I'll have them all in different groups, but I'll make sure that the group that knows less than the others … [say] "You guys listen because this is where you're going to."

It is important that the teacher defines the nature of the activity that will occur in the mathematics classroom. This includes the teacher conveying her expectations about the nature of the activity. A common theme running through this teacher's expectations was that "maths is a thinking activity". Time was also spent explaining to the students what maths is about, how school mathematics exercises "work".

The ways in which teachers set up group responsibility for the group's achievement was played out in a number of ways in this classroom. For instance, the teacher checked with all members of the group even when the teacher didn't expect a response from the student. The students also retained the right to "tell the teacher" what they needed. The ways in which teachers protect the mana of students when taking a risk of being wrong appears to be a pivotal point for many students. The teacher's actions are critical.

> I think it's about … being very precise with them, so that when they give … a possible answer, that that is the best that they can do and quite often they don't feel good. They know they're not right and so the things I do are just … "that's ok, we can start from there" and use what they know, so it's not putting them down … but it's still working towards that whole thing of being precise about what we're doing in maths … So they don't know and they don't know how to get there and I don't put them down for trying to get there.

There were lots of instances of emphasising thinking about maths.

> It's things like within a small group you see one kid that's … really lost, so what I often do is … obviously realising that I'm not getting through … hand the teacher role over to another kid and Māori kids love that, they love having that role, they love being able to work with other kids, [I say] "Can you show that person how to do it?" … So the kid shows the other kid how to do it and then I'll re-phrase what that "teacher kid" was saying … It's a whole language thing.

Using some students as experts needs to be carefully managed by the teacher to ensure that this is acceptable to the students as a group.

> Everyone knows who the experts are, that's a whānau thing … I guess what I do is not create barriers between all of them … but I don't put them too high on a pedestal … you know … they're just … they're learning, we're all on the same waka.

> It's usually friends that will team up … They're pretty picky … Someone won't teach that person because they don't get on … so it relies on their relationships.

> Someone might be like T having trouble with something … There were a number of people I could have got to help him … But I would choose someone that T has a good relationship with and is respectful of that person and understands that person. So … it's not just teaming him up with someone who's able, it's teaming him up with someone he gets on really well with, but won't be silly, but that person is responsible … I judge the responsibility, but I also judge the relationships between the kids and use that to help him.

> Yeah, because they don't like being wrong … If they know they're wrong they won't say anything, so they won't try, they're not very good risk takers … so you've got to break down that boundary of risk-taking, let them go for it … because … they like to do it well, but the whole learning thing … [requires you] take a risk and get it wrong.

The teacher needs to ensure that the mana of all students is protected in the classroom learning situation.

Discussion

From a socio-cultural perspective, the teacher, in order to advance the understanding of other group members, appropriates the contributions of those who are knowledgeable. These become the norms of group work, and these norms are mirrored in the student group in which peers interact with each other. These interactions are framed in the context of the classroom setting, not as a separate peer culture operating at odds to the adult culture. Alton-Lee (2003) described "the peer culture [as having] been developed by the teacher to support the learning of each member of the community … Caring and support is integrated into pedagogy and evident in the practices of teachers and students" (p. 89). Alton-Lee challenges us in "making student learning processes and understandings transparent" (p. 90).

The role of the teacher is in being responsive to student learning processes that are inclusive of Māori students.

> You have to think about it … So everything they say has to reflect what's going on in their head. The Numeracy Project asks us to change … Māori kids can do it but it's the style you do it in … It's the way you do it, you can't isolate them, you can't make them feel bad for not knowing … That's the trick … you know … keeping them on board.

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