
INSIGHTS FROM ABORIGINAL TEACHING ASSISTANTS ABOUT THE IMPACT OF THE BRIDGING THE NUMERACY GAP PROJECT IN A KIMBERLEY CATHOLIC SCHOOL

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As part of the Bridging the Numeracy Gap Project, four Catholic schools in the Kimberley appointed Key Aboriginal Teaching Assistants in Numeracy who, along with a classroom teacher from the school, participated in a 6-day professional learning program aimed at developing their mathematics teaching and leadership. At the end of 2010, audio-taped conversations took place to gain insight about the impact of the Project on learning and teaching mathematics at the school. Analysis of these data demonstrated that Aboriginal Teaching Assistants had clear views about the positive impact of project and of how to improve Aboriginal students' opportunities to learn mathematics at school.

Introduction

Aboriginal people across Australia advocate strongly for children, and speak passionately about the important role that education plays in breaking the cycle of poverty experienced by many Aboriginal families. Sadly, Aboriginal and Torres Strait Islander students continue to have lower scores on national mathematics achievement tests than non-Indigenous Australians, and lower rates of secondary school completion.

One recent Federal Government initiative that aimed to reduce this education gap has been the *Literacy and Numeracy Pilots* (Department of Education, Employment and Workplace Relations [DEEWR], 2010). This paper reports on one of these pilot studies *Bridging the Numeracy Gap in Low SES and Aboriginal Communities* (Gervasoni et al., 2010) that involved 42 school communities across Victoria and Western Australia, including four schools in the Kimberley.

The focus of this paper is an analysis of the views of three Aboriginal Teaching Assistants (ATAs) from a participating Catholic School in the Kimberley. Their perspectives are examined to provide insight about the challenges facing our country as we learn to bridge the numeracy gap.

Bridging the numeracy gap

Both at national and state level there is concern about the size of the 'gap' between the results of non-Aboriginal and Aboriginal students on the national benchmark tests in

numeracy (Australian Association of Mathematics Teachers [AAMT], 2009; DEEWR, 2009; Perso, 2002). Many researchers argue that that this is due to the difference between the mathematics of Aboriginal people and Western mathematics, and the ways in which Aboriginal children learn (e.g., Perso, 2002). Jorgenson (2010) explored an inclusive pedagogy model in Kimberley schools, based on successful practices in the United States, but noted that the pedagogies they aimed to develop had little effect or were inappropriate in this context. She concluded that the changes needed to Indigenous education are profound and urgent, but that such changes must be considered in light of the needs and cultures of the people with whom we, as researchers and educators, work. This finding suggests that drawing upon the views and expertise of Aboriginal people is critical. Indeed, Howard, Cooke, Lowe, and Perry (2011) argue that enhanced educational quality and equity for Aboriginal students can only occur through purposeful curriculum change, quality teaching, increased student participation, and the engagement of the Indigenous community. They also highlight that programs aiming to improve education outcomes for Aboriginal people need to consider the social, cultural and community contexts of the Indigenous learners and their families, as well as the mathematical characteristics of the material to be learned (Howard et al., 2011).

Constructs for evaluating programs involving Aboriginal people

Matthews, Howard, and Perry (2003) identify seven constructs that they argue are important for evaluating programs involving Aboriginal people: Social Justice; Empowerment; Engagement; Reconciliation; Self-determination; Connectedness; and Relevance. These constructs are used to analyse the transcript excerpts examined in this paper so need to be well understood. For this purpose, they are outlined below.

Social justice is about treating all people with dignity and respect. It is about a community recognising and acknowledging injustices and the development of appropriate actions and processes to address these injustices for individuals or groups so that there is a degree of equality in the overall outcomes. It is about a freedom of choice. It is about living with your own rights and beliefs and not those imposed from others. It is about your right to be who you are.

Empowerment is gaining the necessary knowledge to impact upon change that is essential for effective educational outcomes. It is about Aboriginal people making decisions and sharing their knowledge and skills with others. Being empowered is about making a difference.

Engagement is being able to interact purposefully with the discourse around mathematics learning. It is about being excited about what you are doing. It is about being treated as a capable learner. It is about respect and positive interactions.

Reconciliation is about walking in someone else's shoes. It is about taking the time to listen and to care. It is about working together. It is about sharing and understanding the diversity of culture. It is about appreciating people and their values, language and learning styles. It is about recognising and appreciating difference.

Self-determination is political. Aboriginal people are a minority people in their own country. To achieve self-determination, there need to be Aboriginal people in control and making decisions. It cannot happen when there is always a non-Aboriginal person with the power to say 'yes' or 'no' as to what can happen. Individually it can be achieved - you can determine for yourself if you have access to health, education and support.

Connectedness is a sense of belonging. A feeling of being accepted, knowing that you have as much right to be in a place as any other person. The need for Aboriginal students

to know that people [teachers] like you, relate to you for who you are. It is about the need to implement the talk. It is about honesty, integrity, being a critical friend in what you bring to any given situation as an important person within the Australian society.

Relevance is about bringing the Aboriginal students' environments into the mathematics classroom. It is about providing Aboriginal students with the necessary mathematical skills to enable them to look beyond their horizons. It is about Aboriginal country, Aboriginal nations. It is about where an Aboriginal student lives and using that country in mathematics curriculum, teaching and learning. It is tokenistic to think of relevance being only the application of Aboriginal motifs to classroom materials. The relevance is in how, why, and who make the motifs and how materials are used. (Matthew et al., 2003, pp. 23–24)

Insights about learning mathematics

As part of the *Bridging the Numeracy Gap Project* evaluation, two members of the research team met with three ATAs at School K to discuss their views about the impact of the project and advise about how to assist students to learn mathematics effectively. The conversation was digitally recorded and transcribed, then analysed in terms of the seven constructs identified by Matthews et al. (2003): *Social justice*; *Empowerment*; *Engagement*; *Reconciliation*; *Self-determination*; *Connectedness*; and *Relevance*.

First, the transcript was broken into 44 naturally occurring segments according to the topics, ideas, and issues discussed during the conversation, and then each segment was tagged according to the construct with which it was most strongly associated. The number of segments associated with each construct is shown in Table 1.

| Construct | Number of Segments |
|--------------------|--------------------|
| Social Justice | 2 |
| Empowerment | 4 |
| Connectedness | 5 |
| Engagement | 12 |
| Reconciliation | 10 |
| Self-determination | 6 |
| Relevance | 5 |

Table 1. *The number of transcript segments associated with each construct.*

The most common associations were with the engagement, reconciliation, and self-determination constructs. The Aboriginal Teaching Assistants provide many insights about the challenges faced by children when they are learning mathematics. The following section presents illustrative examples of these insights in relation to the seven constructs.

Social justice

Social justice is about treating everyone with respect and dignity. It is about acknowledging and addressing injustices so that there is a degree of equality in the overall outcomes. It is about living with your own beliefs and not those imposed from others. However, this is not always the experience of Aboriginal students, parents, and teachers. One ATA raised the issue of how important it is that teachers have high expectations of Aboriginal students:

Perceptions, and that (Aboriginal children) have potential. They can excel at anything. Because a lot of people, when you have an Aboriginal child that can read really well, is really good at maths, it's like, "Oh!" They're surprised by it. Why should they be surprised? It's like, "Yeah we can do it."

This issue of low expectations of Aboriginal students is a social justice issue that needs to be addressed by school communities and school systems.

Empowerment

As part of the Bridging the Numeracy Gap Project, each Catholic School in the Kimberley nominated an ATA and a classroom teacher to participate in a six-day course focused on learning and teaching mathematics. One of the ATAs explained that this experience enabled her to gain important knowledge from other Aboriginal people.

It's been really good actually 'cause there's a lot of things that I didn't sort of know were happening. 'Cause I've been talking to other ATAs who are involved in this, like Robert who's from St Clare's and he was saying that they were ... taking on the more *hands on* approach and he was saying how it works there, and he had a lot of stories and so did Lisa from (up north) ... and it was good in that way, just that networking, and we could all talk about it ... Some of the data stuff though, Alice sat down and had to actually explain to me, but otherwise, other than that, it was really good. I enjoyed it.

She also gained knowledge through observing the classroom teacher assess students using the *Mathematics Assessment Interviews* (Gervasoni et al., 2010), and was impressed that this assessment used practical tasks rather than written questions.

I've seen *Linda* do a couple (of Mathematics Assessment Interviews). Like she's invited me into actually watch her test ... It's been good 'cause she's got everything set up and they're just doing each question with the different equipment that's needed. And again, testing hands on, that's something that, you know. When you look at testing, "Oh it's just a written piece of paper, it's a written test" but testing hands on, you know, it's great!

Lucy recognised the importance of her role for making a difference in the community.

Sometimes I think about being a teacher but then I also think maybe I do a lot of good as an ATA as well.

ATAs are encouraged to pursue further studies in education, but many believe that the role they play in connecting with the community would be difficult if they were teachers and worry that the community would view them differently.

Engagement

Children's engagement in mathematics was an issue of considerable interest and concern for the ATAs. They had a clear view that Aboriginal students learn well through visualisation and hands-on activities, such as they experienced with *Linda*.

Oh it's awesome. The kids love when Miss *Linda* comes over to Year 2 because there's that hands on, that visual, the fun atmosphere about learning about Maths, not just the blackboard and the paper you know. I've noticed that when ... Aunty *Linda* has come to our classroom, the kids love learning Maths without even realising it's Maths time. They're just straight into it. It's good.

However the ATAs explain that, as the children move through the school, their experiences of learning mathematics change; they become less engaged.

Getting them to participate, that's something we do really well at in (the) Early Childhood Years, and that shows in the attendance rate and yet ... (in) middle primary and in senior school and the high school, slowly it drops away because they're not having fun anymore. You know they're not learning the way that the... How can we teach one way *hands on*, and then all of a sudden they hit Year 2 and Year 3 and then straight away (the teachers) are banging in the worksheets there, and the text books there, and writing from the board, reading, and all that sort of stuff.

And it goes back to the point, if you can't read the question, then you can't answer the story, so why are you giving them a Maths book ... if they can't understand it, then they'll just sit around. Whereas if you've got the hands on stuff that we do with Linda, and then that's good and everybody gets involved.

The views of the ATAs highlight that creating mathematics classrooms where students are engaged and enjoy learning is critical.

Reconciliation

Reconciliation is about listening and caring, working together, and appreciating people and their values, language and learning styles. This theme of reconciliation was apparent in the ATAs' conversation around children, parents, teachers, and themselves.

They highlighted how important it is for education that connections are made between students and teachers.

It's making the connection with the kids and then knowing who they are, and what they can do, not kind of labelling them under the levels and abilities.

A number of the families live in a community some 30 minutes from town, and seldom visit the school. However, the ATAs were critical in helping the teachers to appreciate this community, and parents to appreciate the school.

We went out to *Willow Creek* again at the end of last term and we actually took out all the (children's) reports and portfolios out there and we actually sat down and went through the reports with the parents, because, I mean reporting is very, it's really hard for a parent, especially one that isn't as educated, and even, like the teachers at the school, we don't understand all the dots and the shapes (in the reports). You know, how can we expect a parent to? So we sat down with (the parents) and we actually went through it saying, "He's good at this" or "He needs work on this" and this sort of thing.... And they enjoyed it, and we actually got invited back again.

The ATAs felt highly valued and appreciated by the principal, and made several comments about this.

We all feel valued and we know that we're valued and even ... Mike [principal] will come to us and ask us questions. We've never had that sort of a principal before. And it's that feeling valued and knowing that your opinion counts.

The ATAs also highlighted how important it is for classroom teachers to listen and learn about the community from all those about them.

And I think too, with new graduates ... 'cause I've had a string of graduates sort of straight out of university, it's just listening to who you have in your community. Who you have in your school as well, 'cause ATAs are a good source of information, as are you know people that have been there for a while, as well and the Indigenous parents.

Our role isn't just confined to the classroom ... we're a member of the community, but we're also, we have a lot of other input, and ... value to the rest of the school. But a lot of

teachers think, oh you're just there to assist them, that's it. But it's not. ... There's a lot more to our role than that.

Self-determination

Self-determination is about politics and about voicing your opinion and making decisions about what can happen, without someone else having the power to say 'yes' or 'no.' The ATAs have many insights and opinions related to education, and exercise their agency.

We're very passionate about what we do and we put 100% into our positions. If we see that there's something not quite right, then we're quite willing, and you know, very open to voice our opinion.

They also voiced the opinion that things need to change if the education gap is to be bridged, and argue that a *hands on* approach is needed in mathematics.

(Our) whole thinking needs to be changed, because obviously what we're doing now isn't helping. It's not working. That's why the gap is there with the Indigenous and non-Indigenous students with their education. And I think we need to look at it as a country, "Okay, so this isn't working". We need to bring in something that will work, and that would be with this, *hands on* (approach).

One ATA highlighted the importance of Aboriginal parents being involved in decision making about their child's education.

When my son was in Year 1 ... it took me a long time to convince the teacher that he could read really well. I knew what he could do at home and then I could see what he was bringing home and I said, "No he can read." and she had him as a level 1 ... and I'm not into levels or anything, but I think, "He's going into Year 2 as a level 1 and he hasn't been assessed or anything" and I actually got him assessed with his reading test and he was a level 18 ... This teacher had this assumption that he couldn't read, you know. It took me as a parent to say, "No. I know he can be better at that." That's just keeping him down there when he could be ...

This excerpt also highlights the importance of the teacher listening to parents and assessing students at the beginning of each year to determine their current knowledge so that appropriate instruction can be designed to meet students' learning needs.

Connectedness

Connectedness is about belonging and being accepted. The ATAs explained that connections and relationships were very important, particularly for the parents. It was also clear that the ATAs played a critical role in building connections and relationships between the school and family members.

Just to know each other and get an understanding. Like get (parents) to understand where we come from at the school, and what we do, and then how they feel at home, like you know, if they're feeling left out of the loop; then it's kind of like for us to explain it to them. Like that connection ... If ... they feel they don't want to speak to the teacher about it, then there's always us there, and you even actually get the connection between non-Indigenous parents coming up to us as well ... I think you feel that connection as soon as you start talking, as soon as you know everybody in your community, then it's a good, like, fostering that relationship.

The ATAs also developed and co-ordinated a Backpack Program for families that included mathematics content. This was another way in which they built connections between the school and home.

I think also the backpacks are good for parents to take an interest in what their children are doing at school. It's like, "Oh so this is what you're doing, it's great you know". And just being a part of that and they're doing it at home. They don't have to come into the school to see what their child is doing, you know what they're learning and that. Those backpacks are at home, it's in their environment where they're most comfortable probably, so that's good as well.

However, the ATAs also cautioned that schools are unfamiliar environments for some students, and they were very concerned about this.

This is the school, it's a foreign environment and if they're not going to be happy with their learning, well then, we'll try and do something else and take them out and do something different ...

Researcher: Schools shouldn't be foreign environments should they?
 Interviewee: No. They shouldn't be. ... I think for Indigenous kids. A lot of parents keep their kids at home for a very long time. They don't look at pre-primary as being compulsory and Year 1 as being compulsory. It's ... up to the school to try and get those kids in. But we have kids that might turn up on one day, and that day they might not like it, so they don't come for the rest of the term. So ... to them it's like, "What am I doing here?" and "I don't want to be here." So it is a foreign environment, and I know it shouldn't be, but that's usually it to them.

Surely Aboriginal children should not be experiencing schooling as a foreign environment in their own country.

Relevance

Relevance is about bringing Aboriginal students' environments into the mathematics classroom and enabling students to use mathematics knowledge and skills to look beyond their horizons. The ATAs described a program in the western desert that made school relevant for students.

The perfect example would be Fitzroy Crossing. The kids that we were talking about before, *Melbourne College*, they took those kids out of the Fitzroy School and took them out to Leopold. Now those kids went to school every day but they weren't just in the classroom, they were doing a lot of practical things, they were learning at the same time. Now (some of) those kids are going to *Melbourne College* but they actually enjoyed it because it was the practical things that made it enjoyable for them.

The ATAs were also aware of the mathematics students used outside of school. However, they noted that the students didn't always connect this knowledge to what they saw in textbooks and worksheets.

Researcher: Do the kids do much Maths outside of school? There's a lot of the card games that go on and then, what else?
 Interviewee: Well they know about money. They understand money, like they know what two dollars is and a dollar and 50 cents and they know if they want to buy an ice-cream, they have enough money to buy an ice-ream. So they understand that, I suppose they're doing that all the time. I think the difference is whether they understand the concept of money, oh yeah here's money, here's two dollars, I can go and buy this lolly, like

the price tag of two dollars. But as soon as you come into the classroom, it's just that different atmosphere of learning and how do you put the two and two together, but they're still the same thing as when you're shopping.

This last comment highlights how importantly the ATAs view students' development of mathematical concepts, as opposed to their simply being taught procedures for calculating that they do not understand.

Conclusion

The perspectives examined in this paper highlight the critical role played by Aboriginal Teaching Assistants in helping school communities in the Kimberley provide high quality learning environments for students and their families. Although they are sometimes viewed as just helping out the itinerant teachers in the school, Aboriginal Teaching Assistants are often the only permanent members of the school staff, and play an essential role in building community connectedness and relationships between teachers and families.

When associating the transcript excerpts with the seven constructs used to examine their perspectives, it was found that the Aboriginal Teaching Assistants were particularly concerned about: (1) student engagement in mathematics learning; (2), the importance of the school community appreciating people's values and learning styles (reconciliation); and (3) involving Aboriginal people in decision-making about their children's education (self-determination). Connectedness (belonging), and relevance were also highly represented in their discussion.

Overall, the views expressed by these Aboriginal Teaching Assistants lead to a vision of education in which: Aboriginal students and families feel part of the education system and are highly involved in decision-making; students are engaged in a relevant and engaging curriculum that they enjoy, and that enables them to learn successfully through visualising, modelling and practical experiences, with minimal use of worksheets and textbooks; teachers believe in the potential of Aboriginal students, have strong relationships with students and their families, high expectations for students as learners, and are able to meet students' learning needs through culturally appropriate instruction; and school communities draw upon the expertise of Aboriginal Teaching Assistants, invest in their professional learning, and acknowledge their critical role in building community connectedness and advocacy for Aboriginal students and their families.

Learning from each other and working together to bring about this vision for education is what Reconciliation is all about.

Acknowledgements

The research reported in this paper was funded by the Australian Government as part of the *Bridging the Numeracy Gap in Low SES and Indigenous Communities* Project. The authors acknowledge gratefully the contribution of teachers, parents and students in the 42 school communities involved in the research, and of our colleagues in the research team.

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