

Dispersing Mathematics Curriculum Leadership in Remote Aboriginal Communities

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In remote Aboriginal communities, there are many challenges that confront educators, not the least of which is leadership that challenges the status quo and moves Aboriginal communities forward in their access to, and engagement with, the mathematics school curriculum. This paper draws on data from the *Maths in the Kimberley* (MiTK) project where the complexities around reforming mathematics were investigated through leadership models. It was considered that the complexities faced by principals in their day-to-day management of schools closed down their capacity for curriculum leadership. A new model of curriculum leadership, based on the Accelerated Literacy model was adopted for numeracy reform. This model, its genesis and its implementation is discussed along with the mitigating context that shapes the need for models of leadership that focus on curriculum reform for remote Indigenous contexts. The implications of this model are discussed in conjunction with the field of mathematics educational research.

The underperformance of Aboriginal Australians³⁵ is a recognised concern in education. Educators, policy makers, governments and Aboriginal communities are vocal in the need for reforms that will enable greater access of Aboriginal students to school knowledge. This is particularly the case for remote Aboriginal communities as they are consistently recognised as being most at risk of poor performance in national tests such as NAPLAN (NAPLAN, 2008). Remote Aboriginal students have been shown to be considerably lower in their scores in literacy and numeracy than students (Indigenous and non-Indigenous) in urban settings. This trend is even more concerning the longer they stay at school since the gap in performance increases with the time in school (MCEECDYA, 2009).

The *Maths in the Kimberley* (MiTK) project is a research project³⁶ designed to trial an innovative pedagogical approach in the teaching of mathematics in six remote Aboriginal schools in the Kimberley region of Western Australia. Drawing on the work of Boaler (2008), Boaler and Staples (2008), and the Productive Pedagogies model developed in Queensland (Hayes et al., 2006; Lingard et al., 2001), this project seeks to improve the achievements of Aboriginal students in learning mathematics. While other papers have been written outlining these aspects of the project (for example, see Jorgensen, Grootenboer, Niesche, & Lerman, 2010; Jorgensen, Sullivan, Grootenboer, & Niesche,

³⁵ In this paper and the overall project we only use the term Aboriginal rather than Indigenous or Aboriginal and Torres Strait Islander people. This is due to the fact that the project is only working with Aboriginal people in a remote location of Australia. We acknowledge the standard protocols of naming the first people of Australia but suggest that it is more appropriate in this paper to remain with the convention of using only Aboriginal to refer to the focus communities.

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2009; Zevenbergen & Niesche, 2008), here we wish to acknowledge the importance of school leadership in initiating and sustaining these reforms. In this paper, we demonstrate some of the unique challenges faced by the principals of these schools and argue that new ways of dispersing curriculum leadership is required to effectively implement both curricular and pedagogical reforms in mathematics education in these schools. The term 'distributed leadership' has become problematic in recent years as not only is it used to describe a range of understandings and processes (Woods, Bennett, Harvey, & Wise, 2004) but also results in significant discrepancies in its usage (Mayrowetz, 2008). We prefer the term 'leadership dispersal' (Lingard et al., 2003, p. 14) to designate the ways that leadership is exercised by a range of staff in schools not just something that is directed by the principal and distributed or devolved to others.

The data in this paper are drawn from extracts of interviews conducted across the project. Some the data were collected in the initial phases where we sought to gain a sense of the issues and the context of the study. We have since conducted focus interviews with various staff (teachers, principals, consultants) about particular aspects of the project, including the need for professional development around mathematics teaching, and learning and assessment. Now in its third year, the databank of interview data is very comprehensive.

Remote Aboriginal Education: Complexities for School Principals

The principals of remote Aboriginal schools face a very different prospect than their peers in the city and even many rural areas. Particular difficulties come in the form of remoteness and access to resources, the large numbers of early career teachers, a high turnover of staff, complex relationships with the local communities and significant cultural issues to deal with on a day to day basis. All these factors impact upon the capacity of leaders in remote areas to deliver quality curriculum, and in this case mathematics curriculum. With increasing calls from certain sectors of government and the leadership field that principals need to be 'curriculum leaders', the models of leadership that are premised on urban or mainstream education are grossly inadequate for the significant reformation needed in these communities. In this section of the paper we outline some of the difficulties faced by school principals.

First, most of the teaching staff in remote contexts are often in their first or second year of teaching (Heslop, 2003). This is not to suggest that these teachers are necessarily 'inferior' to more experienced teachers, but rather, that these teachers have different needs to those of experienced teachers. Teacher turnover is high with some not coping with the challenging contexts and often not even completing their contracts. Examples have included some teachers only lasting a few weeks while others have survived a term and not returned after the break. A few teachers may stay on but the usual contract in these schools is two years. Thus retention of staff is low and with that comes the on-going demand of professional learning, inductions and sustainability of reforms. Many of these early career teachers have also expressed particular anxieties about their limited mathematical understandings and difficulties in teaching school mathematics.

Second, remoteness and access to professional learning opportunities creates challenges for teachers to be able to learn and/or develop new and more appropriate ways of teaching mathematics. In the MiTK project, the distance between the two furthest schools is over 1000 km. This distance is a feature of remote education and is not unique to this project. This distance creates unique challenges for many aspects of school leadership. Principals have to close the schools in order for the teachers to attend professional learning

sessions. This is due to the fact that many of the schools are small and only have one or two teachers. Therefore, access to replacement teachers is not possible and closure of the school impacts on student learning and attendance data. As the schools are funded on attendance and enrolments, closure of the school has a considerable risk for financial management. In our context, teachers have negotiated closing school for one day and the second day of professional learning is undertaken on the weekend. For example, the first day of the workshop is on a Friday for which the school is closed, and day two is on Saturday. Teachers then usually return to their communities on Sunday.

Third, the demands on the principal as community leader are enormous. Independent Aboriginal schools and Colleges work on a model where the principal is the head and must report to, and work with, the local community council. This Council works in a similar fashion to a Board of Directors and the principal reports to that Council and enacts the wishes of the Council. The principal is regulated by the statutory authorities – such as Federal and State governments. These agencies provide funding for the schools for which the principal is accountable. The level of governance is phenomenal for independent Aboriginal schools and for which the principal is solely responsible. There are considerable demands on the role in terms of funding, enrolments, buildings, grounds, safety, compliance, governance and so forth. In the modern age, these responsibilities make up a full time role without the support of a government system behind the school. For instance, as one principal remarked:

An unfair proportion of my time is spent dealing with the financial aspect, I suppose the business side of things, the sourcing of funding, acquitting funding. So yeah I would say that if you look at the way that government schools are funded, there is a lot more expectation for the independent principal to source and acquit things (Interview with Principal 1).

Similarly when asked about the amount of time spent on funding, budget applications and other compliance procedures, another principal responded:

Oh, yeah that takes up most of my time. That's a good point. Things that take up my time as principal percentage-wise is an issue because I would rather dedicate it towards curriculum and in classroom kind of stuff where. Being in these kinds of communities it's still probably 40% community work, 60% school, and 50% of the school is probably actual day to day school stuff whereas the rest is just all stuff that would probably be done externally at other schools. (Interview with Principal 2)

Furthermore, in these remote communities, the school is often the first port of call for the community members in terms of providing advice or reading/translation of letters, reports, requests etc. The principal also assumes responsibility for the maintenance of water pumps, power supply and so on. The principal may also take on roles to create enterprise activities within a community. For example, in one community the principal has opened an art gallery at the school and is trying to create a bakery in the local store. These enterprises create employment opportunities in the small communities and help to secure some funding and employment for the communities.

I knew that the role here would be quite removed from the standard metropolitan principal. The roles and duties and expectations are more of a community leader as well as principal and in this particular setting I also run the community art gallery which is owned and operated by the school. (Interview with Principal 1)

Within this context, principals have little opportunity for curriculum leadership despite a recognised need and well-intended efforts in this area. The over-governance of remote Aboriginal schools dramatically inhibits principals a role in curriculum leadership. As such, models of curriculum leadership are needed that create spaces for curriculum

innovation in mathematics that allows teachers to develop appropriate forms of curriculum, pedagogy and assessment within the confines identified above. In such a context, clearly the need to improve mathematics learning must be shifted from the role of the principal to another level.

I guess there's no real leadership in it, you know we could be totally off the planet, you know deciphering these WA curriculums in possibly the most bizarre ways, you know, no one from WA is working here at the moment [laughs]. Yeah, I guess having being able to get that leadership in that regard as well, you know it disappoints me that I can't get to that as well. (Interview with Principal 2)

A Model for Dispersing Curriculum Leadership

The schools in which the MiTK project is operating all use the Accelerated Literacy (unknown, 2009) approach to teaching literacy. This approach has considerable hands-on support for teachers with a literacy consultant who works across the schools to effectively provide two schools with a full time consultant. Teachers working in remote areas have argued for the importance of face-to-face interactions rather than electronic forms (Niesche & Jorgensen, 2010). This consultant provides teachers with curriculum documents, model lessons, modelling teaching practice, and providing feedback to teachers on their teaching. It is a very intensive program and has acquired significant funding from the Federal government for its implementation.

In response to the ongoing challenges facing the schools' principals to commit significant time to curriculum issues and the success of the Accelerated Literacy program, the MiTK schools have combined their professional learning funds to secure support in 2009 for one numeracy consultant to work across the six communities. As a result the numeracy consultant spent at least one full week per term in each school. The other time was spent in larger schools or in a regional area developing resources to support teaching. In 2009, further funds were sought to extend the project in 2010 with a further consultant being added to the Kimberley region in which the project is located as well as being extended into the Pilbara region. The principals saw the value in such a model and were keen to support it. Both numeracy consultants have taught in the region before, one also having been principal so their familiarity with the particularities of the schools and contexts are crucial.

Unlike schools in urban settings where new teachers are usually provided with mentor teachers in their first years of teaching, such a partnership is highly improbable in remote areas due to the fact that the staff are almost all neophyte teachers, so there is little capacity for senior staff to mentor. The model of dispersing curriculum leadership is one of high interaction with the teachers and students whereby the consultant teacher works closely with the teacher. Teachers and the consultants see this type of role as critical to changing the practices of teachers. They see the role as important in terms of supporting new teachers. For instance, one of the numeracy consultants commented:

It is important that teachers have support. Many of them are new to teaching and don't know what to do other than what they learnt at uni. Unless we work with them, they don't get any new ideas. So this role is important to scaffold the new teachers. (Interview with Consultant)

And this:

What I have to do is after being with the teachers, I find that they don't know where to go next and they don't have the time or the resources to do that. My role is really to support them in moving forward. So when I go back to Broome, I prepare resources for them. These are usually the planning documents, and in some cases, even lesson plans along with the resources they need. We have built

up a good bank of teacher resource books so then I can look at these to get ideas of how to build some better lessons and unit plans. (Interview with consultant)

Also, the staff numbers at schools are often very small so there is limited capacity to provide time out for mentoring:

There are not many chances for teachers to be able to get out to their class to go into another one to support another teacher. The schools are small and teachers have to take responsibility for their students. It is not possible for time release for teachers to move into other classes. Principals are too busy to even get into classes so that is not really possible either. (Interview with Consultant)

In addition to the lack of release time for teachers are the limitations due to technology and therefore resources. In many of the schools, access to the Internet is limited – both in terms of the physical capacity of satellites to download materials and in terms of costs for downloading. Small schools have only limited curriculum resources from which to draw. This meant that access to information to support teachers in the development of materials and learning opportunities was limited. Some of the teachers' comments included:

We are pretty limited here with resources. I would like to be able to do more planning but there is just not the stuff we need. (Interview with Teacher 1)

We've got some pretty good resource books here but I find I don't have the time or energy or often the inclination to do planning after school. I just want to get home and away from the place. I would do downloading from home but it is just so slow and always falls out. It is a pain. There are some great things available but it is just too hard to get them off the Internet. (Interview with Teacher 2)

We can't download much from the Internet. The bandwidth is pretty low so it might take forever to get something downloaded. We only have a small plan with the school so it does not take much to get through that. It is very expensive to download because of the expense of the phone lines. (Interview with Teacher 3)

The principals are also aware of the issue of technology:

A difficulty has definitely been technology, which has been a major issue in most of these schools, especially here. Especially now that pretty much all curriculum is headed towards using these new technologies. I feel we're still behind the eight-ball and slowly catching up but yeah, that's a bit of an issue. (Interview with Principal 2)

Scaffolding teachers to develop planned learning that goes beyond the 'activity' approach to teaching mathematics was evident in the approach being taken. The consultants saw the role as one which strong learning trajectories were to be developed so that teachers could plan better for long term learning. However, it was also recognised that part of this role was also to get over the problems of teacher's fear of mathematics:

Teachers are often scared of teaching maths so they don't do a good job of it. If anything, this role is one to help get new teachers off this and become confident in how to teach maths, but also what to teach in maths. They often don't have a good knowledge of curriculum so don't know where to go next or what to do so this role is to help them with that. (Interview with consultant)

Innovation in Mathematics Education

Related to the previous points – time, experience, confidence – is the capacity to innovate. In this project, we have found that the inexperienced teachers are reluctant to innovate, as they are more likely to be in a 'survival' mode of teaching. New and early career teachers need to be able to move beyond survival mode and into new levels of teaching if they are able to innovate. However, the high turnover rates in remote schools may hinder the capacity of teachers to enter this phase of their teaching. We would contend that the issues around remote location coupled with culture shock of living in remote,

isolated communities where the culture and social mores are very different from what has been experienced in the past, may delay the progression into higher levels of curriculum planning and implementation for many early career teachers. It may also be the case for experienced teachers for whom such experiences are unsettling, at least at the start.

The need for changed practices in the teaching of mathematics has never been more urgent. The practices of the past have not been successful so the need for change is noted. What that change may be is beyond the scope of this paper. However, what is recognised is that practice needs to change in order to create pathways for Aboriginal learners in mathematics, and also that curriculum leadership is essential in this process. Where early career teachers may feel insecure with the teaching of mathematics, and this is further compounded by the challenges posed through cultural and linguistic differences, the imperative of reform may be undermined by personal beliefs and self-evaluation:

Many of the teachers don't have the confidence to move away from how they were taught in maths. They may have got some good ideas from their teacher training but they tend to fall back on old methods. If I provide them with the whole scheme of things they need, they are more likely to have a go at it. So I see it as important to get some really innovative things happening but where they are developed for them. I see what they have been teaching and then build from that but take them away from the old stuff they may have been using. (Interview with Consultant)

They have to experience different ways of teaching. The only way they are going to get that is through this role and the support we can offer them. It is not much good coming in and saying 'try this' and then not backing it up. There are too many other demands on them to allow them the time to develop something from scratch so it is best to do it this way. (Interview with Consultant)

Conclusion

In this paper we have sought to show a range of complexities faced by principals of remote Aboriginal schools. We have argued that the typical association between the principal as being the leader is challenged in remote contexts and that other models may be more suitable, and necessary, when considering curriculum leadership. In particular the reliance on the principal for curriculum leadership needs to be re-considered and we propose that the dispersal of such leadership responsibilities may need to rest with others. The complexities of remote education provision, leadership, compliance and reform may well be beyond the scope of the traditional role of a principal. With the lack of leadership hierarchy and the lack of release time for teachers in these schools, this role may have to shift to external consultants as has been shown to demonstrate levels of improvement with the Accelerated Literacy program in Western Australia. With two numeracy consultants now employed amongst the six schools in this region, it is hoped that this will lead to an easing of pressure felt by teachers and principals in the provision of mathematics education in these remote Aboriginal schools. With another year of data collection to go in the project it will be interesting to follow the progress of the teachers and consultants and examine how this dispersal of curriculum leadership is working.

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