

Queensland Indigenous Students in Rural and Remote Classrooms: Pedagogical Practices and Numeracy Learning

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Mathematics

The view, which has prevailed since the time of Plato, is that mathematics represents 'eternal truths', and that it is similarly objective in its portrayal of knowledge. The truthfulness and objectivity of mathematics are now being challenged by writers arguing that maths is culturally based, represents the views of a particular class and background and is a consequence of humans arguing over proofs (e.g., Bishop, 1988; Walkerdine, 1990). Ethnomathematics, for example, takes the view that mathematics has developed differently in different cultures and that exploration of how different cultures understand mathematics and mathematical concepts is important, not only for mathematics but also for cultural understanding (Presmeg, 1997). An area that has begun to address this perspective of mathematics is critical numeracy. Critical numeracy is believed to focus on the way in which practical mathematical situations are implicated in the power relations and face to face politics of everyday life (D'Ambrosio, 2001), and 'on numeracy in all its forms including our relationships to each other and to the world' (Stoessiger, 2002, p. 48). For Indigenous students, participation in mathematics can be considered as an empowering process, acting as a tool in identifying power differences among socio-economic classes, and racial, ethnic and gender groups (Frankenstein & Powell, 1994). Thus there is a growing recognition that mathematics is neither socially nor politically neutral but rather has an important role to play in determining power and positioning individuals according to that power (Bishop, Fitzsimmons, Seah & Clarkson, 1999).

Mathematics Pedagogy

Traditionally mathematics teaching involved rote learning of the rules that were considered to govern the subject (D'Ambrosio, 2001; Ernest, 1989;). This was usually 'accomplished' by engaging students in a series of drills and skills. Such instruction was grounded in the belief that 'students learn by receiving clear, comprehensible and correct information about mathematical procedures' (Goldsmith & Shifter, 1997, p22). In recent years it has been generally recognized that such approaches to teaching mathematics have limited effectiveness. This is particularly true for students who fall into the 'at-risk' category, including students from a language background other than English, of low socio-economic status, of Indigenous heritage, and girls. For these groups the traditional approaches have more often than not yielded disappointing results (Goldsmith & Shifter, 1997).

Rather than learning about mathematics as a set of abstract principles it is now generally considered more successful for students to work with concrete and real world examples of mathematics in practice. In this pedagogy, mathematical knowledge grows "out of problem situations and ... occurs through active as well as passive involvement with mathematics" (the first Standards document - National Council for Teachers of Mathematics (NCTM), 1989, p. 8), the teachers act as facilitators rather than imparters of learning, and the classroom focus is on the learner, problem solving and active engagement (the second standards document – NCTM, 2000). These positions were echoed by Australian documents such as the Australian Education Council (1990) and Queensland Studies Authority (2004). This *investigative* or *social constructivist* pedagogy enables students to actively make sense of new information and ideas, situated in meaningful and real world contexts (Bickmore-Brand, 1990). The use of manipulative material and construction of knowledge in social

settings (often groups), are key dimensions of the pedagogy. (Schifter, 1998). Teachers act as guides, listeners and facilitators (Schifter, 1998), and new mathematical knowledge is built upon previous understandings (NCTM, 2000).

In order to develop a richer understanding of mathematics and its uses, it is necessary to view mathematical knowledge as not something that is merely gained, but rather as an ongoing construction in the mind of the learner achieved in collaboration with the teacher. Both teacher and learner share an active role in constructing knowledge and making sense of the knowledge thus constructed (Saenz-Ludlow, 2001). Classroom discourse helps students and teachers to construct and develop their interpretations and expressions of mathematical meanings. Rather, they evolve in a continual manner, a manner that results from the individuals' exposure to a variety of closely interrelated experiences within different mathematical, logical, social and physical contexts. This community is influenced by the teachers' goals with respect to and portrayal of mathematics and students' goals and portrayal of learning (Billet, 1998). However many teachers continue to experience difficulties embracing these new methods. One source of difficulty is that they are not in accord with their own experiences of traditional mathematics education (Brosnan, Edwards, & Erickson, 1996). As such they continue to teach using a largely "skills and drills" approach that does not take into account the way in which students construct mathematical knowledge and acquire new concepts.

The role of home life and parents in children's education has also been acknowledged. Though partnership rhetoric is common in most elementary schools today, Ashton and Cairney's (2001) extensive research in the Australian context, identifies a belief amongst teachers that parents still contribute little more to their children's education than help in the classroom and assist with homework. It is apparent that some teachers are unable to recognise the vital role of parents in education and are unwilling to relinquish control in what are perceived as school matters. The differences between children's home discourse and school discourse may in fact be dysfunctional, often resulting in nonparticipation in school mathematics (Walkerdine, 1990). Billet (1998) suggests that individuals' personal life histories and their participation in multiple overlapping communities furnish the knowledge with which to interpret stimuli, and yet this is often ignored in school culture. It appears that in many instances, there is a lack of understanding between "in school" and "out of school" mathematics and even when the links are attempted they can be artificial (Abreu, 2002)..

Thus there is a move from the traditional understanding of mathematics as products, to embedding mathematics in contexts and privileging a learning style that incorporates actively constructing knowledge amongst a community of learners, contextualising mathematics in real world situations, acknowledging that learners learn in a variety of modes (e.g., visual, verbal), and incorporating home life and parents in everyday school experiences. The impact that these movements have within an Indigenous mathematics classroom is the focus of this paper.

Defining Indigenous in Australia

It is important that prior to any discussion of issues relating to Indigenous education taking place, there is an understanding of what the term 'Indigenous' or 'Aboriginal' means in the Australian context. It must be noted in the first instance that Indigenous Australians cannot be classified as a single homogenous group. As stated in a report by the South Australian Department of Education (1999) 'the term 'Aboriginal' represents diverse cultural and language groups with backgrounds ranging across the social spectrum' (p. 6). To make a simplistic classification of 'Aboriginal' or 'Indigenous' that assumes 'sameness' is essentially flawed. Burney (1984) states:

Being Aboriginal is not the colour of your skin or how broad your nose is. It is a spiritual feeling, an identity you know in your heart. It is a unique feeling that is difficult for a non-Aboriginal to fully understand (Quoted in South Australian Department of Education, Training and Employment, 1999, p. 6).

The definition of Indigenous, according to Partington (1998), must now be one that is based on social not biological criteria (p. 7). This is necessary because it is this latter aspect that places a person within an Indigenous context and as part of an Indigenous community. The Commonwealth definition accords with this perspective stating that an Aboriginal is: '...a person who is a descendent of an Indigenous inhabitant of Australia, identifies as an Aboriginal and is recognized by members of the community in which she or he lives'

(Jones, Langton & AIATSIS staff 1993, p. 2). This definition highlights two important aspects of Indigenous culture in Australia. In the first instance it relates to one's own identification as an Indigenous Australian and secondly it involves the recognition by other members of the Indigenous community that defines one as an Aboriginal.

Although yet to be considered an essential determinant in defining Aboriginality, language may also be regarded as an important dimension of Aboriginal identity – particularly in remote communities (Malcolm, 1998). Since Invasion, however, a great majority of these languages have become extinct. Indeed, there now remain only about one hundred Indigenous languages (Malcolm, 1998). These languages are mostly spoken by the elderly and only twenty are being taught to Indigenous children as a first language (p. 118). The survival of Aboriginal languages thus appears somewhat bleak. Such a statement, however, does not take into consideration the continuing development of a number of Aboriginal Creoles that are collectively acknowledged and referred to as Aboriginal English. According to Malcolm, 'the experiences of Australia's Indigenous people gave birth to a distinctive form of English which today provides a link for Aboriginal people with the past which is in their corporate memory' (p. 125). The language(s) are important in maintaining and developing Indigenous identity both within and between communities and have significance in promoting definitions of Aboriginality. They are also of considerable importance when considering issues relating to Indigenous education generally and mathematics education specifically.

General Issues in Australian Indigenous Education

We cannot think, nor should we speak of Indigenous Australians in terms of a uniformed and homogenous group. Rather, Aboriginal children are as unique and individual as their European counterparts albeit with a different cultural context. According to Delpit (1992)

The question is not necessary how to create the perfect "culturally matched" learning situation for each ethnic group, but rather how to recognise when there is a problem for a particular child and how to seek its cause in the most broadly conceived fashion (p. 297).

Malin (1998), further argues that 'although in some situations, cultural misunderstandings may underlie difficulties in classrooms, it is essential that they should be correctly diagnosed. It is important to recognise that every person's manifestation of cultural traits consists of a unique configuration' (p. 249). The individual Indigenous student should be seen in the first instance as an individual who brings to the learning situation their own particular skills, talents, personality, knowledges and history.

It also should be noted that when the literature and statistics refer to the lack of success Indigenous students are demonstrating in education, the education they are supposedly 'failing' is largely a Eurocentric system. This system of education has until fairly recently failed to recognise Indigenous cultures let alone include Indigenous knowledges and skills into the parameters of what is considered success (Morgan & Slade, 1998, p. 7). For instance, assessment practices and items on which Indigenous students are often judged are not culturally sensitive or appropriate and reflect a lack of cognisance that mathematic is both socially and politically positioned (Cataldi & Partington, 1998). Statistics (Gray, Hunter & Schwab, 1998) show poor retention rates, low literacy and numeracy scores and low achievement rates amongst Indigenous students across the board. What the statistics cannot measure, however, is what Indigenous students know and can do with respect to their own cultural knowledges and experience.

Mathematics Learning Styles of Indigenous Students

The idea that Indigenous students would have learning styles different to those of white, middle-class students is not unexpected. Previous sociological research (Bowles & Gintis, 1976; Henry, Knight, Lingard & Taylor, 1988) has already shown comprehensively that schooling is the preserve of the powerful elite and that children who fall outside of this category generally suffer as a result of their knowledges and experiences not being valued. Furthermore, students who come from lower socio-economic groups and/or different cultural groups have learning styles that are either not understood, nor recognised by the system, and therefore receive instruction that is inappropriate to their needs. With respect to Indigenous education, this situation is made more

difficult as much of what is written on the subject has its origins in research that was undertaken over twenty years ago.

In 1980 Stephen Harris' seminal work on Aboriginal education entitled *Culture and Learning: Tradition and Education in Northeast Arnhem Land* was published. The research reported took place between 1975 and 1976 in Milingimbi – one of the Cook Island's east of Darwin. This report addressed the traditional learning styles of Aboriginal students and indicated ways in which European education needed to be adapted in order to suite the learning styles of Indigenous children. Harris made several conclusions about Indigenous students and the way in which they learn that persist to today. He concluded that Aboriginal students learnt by observation and imitation rather than as a result of verbal instruction. He further concluded that they also preferred trial and error to verbal instruction and that they learnt better in real-life rather than artificial settings. Harris also suggested that Aboriginal students learn better when the context is specific rather than having to derive knowledge from generalisable principles. Lastly, he argued that 'information is more likely [to be] learned if it is transmitted through an acceptable person' (p. 97). For this reason a strong interpersonal relationship between teacher and student is clearly paramount.

Harris' (1980) research into the ways in which Indigenous students learn have become, until recently, to be held as virtual truths. Harris, however, did not speak directly to mathematics teaching and learning and his theories predate many of the modern conceptualisations of effective mathematics teaching and learning. Also Harris' positions are coming into question by a group of revisionist theorists who believe that too much time has elapsed between Harris' original research, to suggest that they still accurately reflect either modern Indigenous ways of life, or the way in which they learn. According to Nicholls, Crowley and Watt (2001):

The ideology of an unchanging society based on a kind of primordial Aboriginal cultural essence totally disregards the contemporary contexts in which Aboriginal realities are now constituted (<http://www.edoz.com.au/edoz/archive/features/abed1.htm>).

Thus it is conjectured that Harris' work requires revisiting because to simply adhere to his conceptions of the way in which Aboriginals learn is to deny the possibility that Aboriginal cultures and therefore Aboriginal learning styles have failed to change or develop over the last twenty years, a culturally reductionist perception. At the current time, however, there is a paucity of sustained, systematic and theoretical research taking place in Aboriginal schools generally and mathematics classrooms specifically, to be able to categorically speak to the current relevance of Harris' research.

Other researchers in other curriculum areas suggest that Indigenous students benefit from practical experiences in conjunction with theory (Barnes, 2000); overall concepts should be dealt with before details are explored (Robinson & Nichol, 1998) and these concepts need to be related to prior experiences; Indigenous students prefer to learn through observation rather than verbal, oral or written instruction (Clarke, 2000; Graham 1998; Hogan, 2000); Indigenous students learn better in groups and prefer collaborative learning as opposed to individual achievement or competition (Barnes, 2000), and Indigenous students are visual learners (Craven, 1998) and prefer a structured approach to learning (Collins, 1993). Many of the beliefs about Indigenous learning appear to reflect what we consider as principles for promoting an atmosphere that maximises learning for all. This paper specifically exams how these principles are reflected in Indigenous mathematics classrooms in three rural and remote communities in Queensland.

Observations on the Teaching and Learning of Primary Mathematics in Schools with High Numbers of Indigenous Students

The research project

The research described in this paper is part of a larger project in which the interaction between white teachers, Indigenous teacher aides, Indigenous students and the Indigenous community is being studied to determine effective ways to enhance mathematics learning outcomes for rural and remote Indigenous students. The project is of three year's duration. This paper reports on one aspect of the project, namely: teacher's beliefs, and how they cater for the perceived differences in their everyday mathematics teaching. The data reported in the paper was gathered during the initial stages of the project.

The researchers visit the schools eight times each year. Each of these visits is of approximately one week's duration. The visits consist of working in the classrooms, observing student teacher interactions in these classrooms, and assisting teachers and teacher-aides to develop appropriate mathematical learning experiences that cater for diversity. The theory underpinning this research is that enhanced teacher's actions result in enhanced student learning (Newman & Wehlage, 1995). The three primary schools participating in the study in the first phase of the research are situated in rural and remote Queensland. School A is a three-hour flight from Brisbane, and School B and School C are within a three-hour car journey from School A. The size of the schools and the percentage of Indigenous students attending each school varies. All schools have teacher aides working in all of the classrooms, both Indigenous and non-Indigenous. Table 1 summarises the demographics for each school.

Table 1

Demographics of participating schools.

School	No of teachers	No of teacher aides	No of students	Percentage of Indigenous students
School A	12	16	344	62%
School B	3	4	48	100%
School C	2	4	38	50%

The teacher aides tend to be employed on a part-time basis, with their hours of employment varying from 10 hours to 5 full days. With the exception of one teacher in School B, all of the participating teachers were non-Indigenous. The number of years that they had worked with Indigenous students ranged from 11 years to 6 months, with most working less than 2 years. For a number of these teachers, working in these communities was their first appointment after leaving teacher's college. The number of Indigenous teacher aides at each location were, School A (7), School B (4) and School C (2).

This descriptive study utilized multiple data collection procedures including classroom observations, teacher interviews, teacher-aide interviews, teacher focus groups and artifacts to elicit conditions of engagement for Indigenous students in these classrooms. Structured protocols for the data collection procedures provided the basis for data synthesis. The researcher-participants reviewed their responses from the interviews and observations in a member-check strategy, endeavouring to triangulate the interpretations. The cross analysis between the interviews, focus groups, artifacts and observations revealed patterns of interactions that illuminated the predominant condition of engagement for these students. The researchers' participants recognition of their powerful influence and affinity to the research topic were examined to ensure that voices of other participants in the study were duly honoured (Gay, 2002). The next section summarises the results of this data analysis.

The observed teaching and learning styles in these classrooms

The data analysis delineated seven main themes that were perceived to best assist Indigenous students. First, many held a belief that there were no differences between Indigenous and non-Indigenous students and how they learnt mathematics. Some common comments were *They are the same as the rest; They are all children learning; I don't see the colour when I teach.* This stance could reflect the questions asked as they may construe 'seeing' a difference as a negative, a racial comment. Many also were not aware of the local Indigenous community as they were 'new' to the area, and thus had little understanding of the context in which they lived. In School C there was a strong belief amongst the white teacher aides that as a society we are seeing too many differences between Indigenous and non Indigenous students, which was perceived as resulting in *extra resources being given for these children* - they believed at the expense of catering for the white children in this particular rural and remote community.

Second, many teachers acknowledged that there were language differences amongst the Indigenous students, although in School C they believed that these differences were common to both Indigenous and non-Indigenous children. In this case, they believed these differences simply reflected *living in a rural and remote area of Queensland and the language commonly used by the community as a whole.* The teachers who acknowledged the language differences for Indigenous students tended to be situated in totally Indigenous communities. But in this instance, they perceived that once they knew the common usage of the 'Creole' words

within the community, they could effectively communicate with the Indigenous students, for example, in one instance boney was interpreted as thin. There was no recognition amongst these teachers that these words might have particular nuances and social capital attached to them that goes beyond the translation of the word as a simple idea, such as, the 'shape is boney – the shape is thin' (Walkerline, 1990), such as, reflecting existing health issues within this community.

Third, a commonly adopted pedagogical approach to teaching mathematics within these classrooms was rotational groups. All teachers believed that Indigenous students are more responsive to small group activities rather than whole class activities. They believed that teaching in groups not only caters for a more diverse range of learners but also, as one teacher argued,

... caters for students who don't concentrate very well at all in the whole class teaching, they get side tracked and just muck around; where in small groups I have some hope of them staying on task for the ten minutes.

Commonly, the teachers' mathematics lessons tended to begin with a whole class discussion followed by dividing the children into small ability based groups. These groups rotated through a series of activities, one teacher led, another led by the teacher aide and two independent activities. On average, each activity took 10 – 15 minutes to complete, the teacher providing the focus for the groups in their activity. They believed that the small group activity structure enabled *concentrated work to occur with the students that are experiencing difficulties or have not been present at the beginning of the unit*. They also considered that it provided opportunities for one on one teaching. As one teacher explained, *Students who are having trouble stay with me and we work through it altogether, it's a lot easier you can see where they are improving or where they are having trouble*.

While the groups rotated, the teaching often changed to accommodate the group's mathematics ability. This was particularly taxing for classes with large diversity in abilities. For example, a teacher of a composite Year 1/2 class found the model particularly draining. With the spread of abilities in her class, she found that she was required to prepare complex planning. This not only catered for the wide range of student abilities with different group activities, but for the wide range of teaching actions that both she and her teacher-aide required, to work independently and effectively with groups of students. As she commented, *At this age, their concentration span seems to be limited. I run from one end of the room to the other all the time. There is not a time that I don't speak and I've actually had a lot of problems with my voice*.

Fourth, while attempts were made to contextualise the mathematics taught, both teachers and teacher-aides were unsure how to particularly contextualise mathematical situations for Indigenous students. This could reflect the following:

- (a) These non-Indigenous teachers and teacher-aides were not familiar with educational contexts in which Indigenous students learn and hence they tended to adopt traditional contextualised situations such as money, consumption, and measuring outside the classroom, and in many instances did not even reflect the remote and rural environments in which they were working.
- (b) These Indigenous teacher-aides either appeared unaware of their culture or perceived that their culture is not relevant to western mathematics. In fact some felt so isolated from their culture due to colonisation that they may not possess the cultural knowledge to assist them to effectively contextualise mathematical situations.

Fifth, some teachers believed that Indigenous students need step-by-step instructions when approaching tasks. As one commented,

Yeah. I find the Indigenous kids need a great deal more focused teaching and I would probably spend twice as much time with them as the non Indigenous... the Indigenous kids are not risk takers, they're structured people who are kids who need and feel very unsafe in unstructured activities where I say "right, here are your, for example, here's your resources, here's the question, do that, ok just do it"... You do have to explain and write about how you got there and what your challenges were and how you solved your problems. They struggle!

Sixth, for all the teachers there was also a strong focus on incorporating hands on activities into their everyday teaching. As one commented, *More hands on, fun sort of stuff which I think they've really appreciated.* They all believed that Indigenous students were best engaged with the learning when it was hands on and required minimal writing. Most believed that these students struggled when it came to writing tasks and this struggle perhaps reflected their literacy skills.

Seventh, teachers acknowledged differences in readiness for school between many Indigenous and non-Indigenous students. Many of the early years teachers perceived that these 'developmental' differences represented up to two years differentiation in the early years. It has to be acknowledged though the benchmarks for measuring these differences were very much those used to ascertain progress within white middle class communities. So while these teachers could articulate what these students did not know on school entrance, none could talk about what they did know. They acknowledged the importance of parent participation in early years development but stated that they had great difficulties in engaging Indigenous parents in these discussions, *Most would not enter the School precinct.* This could reflect the fact that many Indigenous parents "have themselves been disadvantaged in education, and have good reasons to view educational institutions as an alien environment which hold little benefit for them" and their children (Gray & Beresford, 2001. p.33).

Evaluation

This study begins to broaden and challenge the pedagogical approaches that Harris believes are fundamental for Indigenous student learning. On the whole these teachers embraced current mathematical pedagogies (Bickmore-Brand, 1990; Schifter, 1998), pedagogies reflecting 'good' mathematics practices for all 'at risk' students rather than catering specifically for Indigenous students (Goldsmith & Schifter, 1997). Unlike many teachers who have not adopted the new methods of teaching mathematics (Bronson et al, 1996), these teachers have. However, the establishment of group work in these mathematics classrooms was in a response to catering for a very wide range of abilities rather than a specific belief in socio-constructivist theories of learning. The groups reflected a belief that Indigenous students best learnt in small groups (Barnes, 2000), allowing for one on one teaching to occur within groups of similar ability.

There was a recognition that intervention classes that traditionally occurred with these communities impacted on Indigenous students self concept, and hence the inclusion of these students in everyday classrooms and the adoption of 'streamed' rotational groups. Thus Indigenous students perceived self concept was identified as an important aspect of learning. This was also reflected in teacher's comments with regard to 'there is no difference' between Indigenous and non-Indigenous students. It appeared that such stances were about equality rather than equity, that is, ensuring that Indigenous students were seen as the same as other students in the classroom context.

The practice of endeavouring to contextualise mathematics in real world situations and the use of hands on experiences again reflected modern understandings of good classroom teaching practices rather than specific pedagogical practices for Indigenous students. Contrary to Harris' belief, this is not a pedagogical strategy that is unique to Indigenous students, as many teachers commented, all students benefit from such experiences. Of concern were the types of contexts used within these classrooms. While both Indigenous and non-Indigenous students found them engaging, in most instances they mirrored a very white consumer centred world, (e.g., buying, selling, building traditional houses), and were not examined in terms of critical numeracy (Stoessiger, 2002) or in terms of recognising cultural understanding (Presmeg, 1997).

The Indigenous students in these classrooms certainly appeared to benefit from one on one verbal instruction. They did not necessarily seem to learn best from observation and imitation or trial and error (Harris, 1980), but did exhibit difficulties with written instructions. This appeared to reflect a gap in their literacy abilities rather than a specific preferred learning style. Indigenous students also gained from practical experiences in conjunction with theory (Barnes, 2000). The data also suggested that these students appreciated structured approaches to learning (Collins, 1993), and that they had difficulties if the learning experiences were open-ended. They appeared to prefer to have these experiences broken down into small steps with each leading to an overall outcome. But once again this was not unique to the Indigenous students. Both Indigenous and non-Indigenous students gained from such experiences, suggesting that these pedagogical approaches are not unique to Indigenous students. In fact the literature suggests that they reflect our current understandings of appropriate mathematical pedagogy (Schifter, 1998).

While it is accepted that Indigenous students' participation in mathematics conversation can give them insights into how practical mathematics situations impact on power relations and the face to face politics of everyday life (Stoessiger, 2002), these classrooms projected a very white view of mathematics. This is evidenced by the types of activities that teachers selected as representing real world applications, the assessing of and perceptions held with regard to developmental differences between Indigenous and non-Indigenous students on entry to school, and the superficial approach that some teachers held with regard to acknowledging language differences within the Indigenous community. So while these teachers were adopting current understandings of mathematical pedagogies, they were still projecting a view of mathematics that represented a particular class.

Conclusion

Within these environments there seemed to be three predominant issues that were not specifically acknowledged in the pedagogical approaches adopted by these teachers. These were (a) the different knowledges with which culturally different students enter school, (b) the nuances and social capital associated with Indigenous English, and (c) the role that parents, care-givers and the community itself plays in young Indigenous students' education. These, we would suggest, are the dimensions that are distinctive to teaching in such communities. We conjecture that learning would be enhanced for these students if these dimensions were incorporated into day-to-day teaching. This is not at odds with other researchers' conclusions from other ethnically different contexts. Gay (2002) conjectured that effective teaching is characterized by teachers who possess knowledge of cultural diversity (including ethnic and cultural diversity in the curriculum), who establish caring, learning environments, communicate with ethnically diverse students, and respond to ethnic diversity in their delivery of instruction. So what does this mean for these teachers and these communities? How do we assist young teachers moving into Indigenous communities to become not only culturally aware, but also able to adapt traditional pedagogical strategies to acknowledge what these students do know, and build on this to begin to address the cultural divide? The next stage of the longitudinal study begins to address some of the issues, particularly focussing on delineating learning experiences that reflect and build on different cultural experiences and ways of engaging the Indigenous community in assisting in this delineation.

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