Aboriginal and Torres Strait Islander Mathematics Alliance Conference 2014

Conference summary


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Executive Summary

The main purpose of this report is to provide a summary of the ATSIMA conference but perhaps more significantly to inform Community, education and business sectors about ways forward to improving the mathematics outcomes of Aboriginal and Torres Strait Islander students and hence life opportunities.

The main objective of the conference was to challenge participants to think beyond current relationships between Community, education and business. This relationship currently relies on a “pipeline” mentality where students move from Community to Education and then to Employment with an array of opportunities (economic and social) afforded to Indigenous people as they progress along the pipeline. At the moment, these opportunities are not being taken up (particularly in employment) and there is a tendency to assign blame back down the pipeline. We challenged the participants to think beyond the pipeline mentality and move to and develop an ecosystem of relationships that focuses on improving the education outcomes for Indigenous learners in mathematics.

An important part to the conference was the collection of data at all stages of the program beginning with the presentations which were followed by the reflection and distillation workshops to identify the important messages from the presentations, and then the emerging themes. From these, participants worked in focus groups to summaries the major findings and key themes.

The major findings are summarised in the five themes below identified as ways forward to improving mathematics outcomes of Aboriginal and Torres Strait Islander students:

1. Culture and identity
2. Leadership
3. Investment
4. Teaching and learning
5. Transition.

To give these five themes life, they must be connected, interconnected and embraced by an ‘eco-system’ of relationships between Communities, education, and business. This is one of the main reasons why the Alliance exists – to build relationships and through these, develop new and innovative thinking and action about mathematics education for Aboriginal and Torres Strait Islander students.

The recommendations from the conference which the Alliance will implement are:

1. Form a task group to meet soon
2. To become an established non-profit organisation with a constitution, membership structure etc
3. Plan for events and 2016 conference
4. To continue to build a well-developed network that connects Community, Education and Business; to grow understanding, promote positive and productive relationships and maximize opportunities;
5. To have established Community driven projects in mathematics education that particularly explores quality teaching and learning;
6. To develop projects that promote more Aboriginal and Torres Strait Islander Mathematics (and Science) teachers in partnership with MATSITI.

We would like to take this opportunity to thank all the participants at our inaugural conference, the organising committee, the keynote speakers, the session presenters and the session chairs. A special thanks to Merv Donovan and Prof Mark Rose for stepping up in a time of need.
Introduction

This conference summary consists of three parts.

Part 1 is based on the detailed notes from the various group discussions that followed the 22 conference presentations on Day 1 of the conference and the emerging themes: Culture, identity and confidence; leadership; transition; investment; and, quality teaching.

Part 2, the Conference Proceedings, provides the abstracts from the presentations with links to many of the presentations and conference papers.

Part 3 provides information from the online survey conference participants completed for the evaluation. It gives insights into people’s thoughts, reflections and questions about the conference, about their own work, and about ways forward for the Alliance.

This conference summary can be viewed as a response to the National Aboriginal and Torres Strait Islander Education Action Plan. It provides valuable information and strategies addressed by the current Plan’s priorities:

- Readiness for school
- Engagement and connections
- Attendance
- Literacy and numeracy
- Leadership, quality teaching and workforce development
- Pathways to real post-school options.

All six of these are clearly connected to ATSIMA’s five themes discussed in Part 1. The Plan sees any work that is done in these areas as a ‘National Collaboration’ – the very essence of why ATSIMA exists.

Background

The Growing Connections and Creating Understanding conference was the inaugural conference for the Aboriginal and Torres Strait Islander Mathematics Alliance (ATSIMA). ATSIMA has the vision that All Aboriginal and Torres Strait Islander learners will be successful in mathematics. This vision is fundamentally important as mathematics is an enabler subject for many careers and hence provides greater life opportunities for Indigenous learners. It also recognises that success for Indigenous learners requires that their cultural identity is supported in the teaching and learning of mathematics. Hence, mathematics must be taught through a cultural lens, not only to support identity, but also to build ownership and relevance for Indigenous students with maths...
Indigenous learners. This vision was the overarching aim of this conference (and any further ATSIMA conferences.)

ATSIMA believes that a collaboration between Communities, education systems, and business sectors could make a difference to the unacceptable mathematics learning outcomes of Aboriginal and Torres Strait Islander students across Australia. This in turn could then make a difference to career and life outcomes. Historically, education and Community have worked together with a range of unconnected results. The Creating connections and growing understanding conference was the first of its kind to bring business and industry onto the playing field with a focus on Aboriginal and Torres Strait Islander students and mathematics.

Creating connections and growing understanding built upon the 2012 National Conference Numeracy, Mathematics and Indigenous Learners (http://www.cvent.com/events/numeracy-mathematics-and-indigenous-learners-national-conference/event-summary-631a1bcdbe390869be03250a7723c3.aspx) organised by the Australian Association of Mathematics Teachers (AAMT). The 2012 conference theme was culturally responsive pedagogy. It showcased innovative teaching practices from educators across Australia.

An outcome of this conference was the Blueprint: Supporting best teaching of mathematics for Indigenous learners (https://custom.cvent.com/AC1461E6AC63400FB8AAA2E83F2C2C45/files/a2a3a86e57f347ed924fc7b11fa1af4.pdf) outlining further action towards improving educational outcomes for Indigenous learners. This Blueprint was the feature of a series of symposiums around Australia during 2013 which led to the formation of ATSIMA as a collective call for action to make a difference. The 2014 conference was one of ATSIMA’s first strategies to develop a national approach.

About the conference

The 2014 conference went beyond the classroom and brought together stakeholders with a vested interest in, and influence on, the educational outcomes of Indigenous students in mathematics. The conference process was designed to explore the complete learning cycle for students in mathematics and numeracy:

- Community: https://www.cvent.com/d/g4qcbk/6K
- Tertiary education: https://www.cvent.com/d/g4qcbk/6K
- School practice https://www.cvent.com/d/g4qcbk/6K
- Business and careers https://www.cvent.com/d/g4qcbk/6K

On Day 1 of the conference, leaders, academics and practitioners from Communities, and school and tertiary education sectors gave presentations – eight presentations for the Community session, eight for the tertiary sector, and six relating to school practice. After each presentation session respective audiences partook in the distillation of practice, reflection and deliberation of the key messages. The day concluded with participants identifying the emerging themes from the Community and education.
The final day of the conference, Day 2, brought together a panel of five representatives from business who spoke succinctly about their respective organisations’ plans, goals and issues in relation to Indigenous employment and the important role mathematics played in this. Their 15 minute presentations were followed by a Q and A session with the audience.

Conference participants then extracted the emerging themes from this session.

From the data collected over the two days – the notes from each of the sessions from Day 1, and the emerging themes from Day 1 and Day 2 – a number of themes were identified:

1. Culture and identity
2. Leadership
3. Transitions
4. Investment
5. Quality teaching and learning.

Inter-connecting all of these themes is the network of relationships that exist, or needs to exist, to take an Indigenous student not so much through a pipeline from home to job, but through an ‘eco-system’ of support between Community, education systems and business sectors.
Part 1: Conference Summary

This section provides a summary of the discussions by conferees during the conference process. It provides a framework to inform any future work that might be done to improve numeracy and mathematics outcomes of Aboriginal and Torres Strait Islander learners.

The themes outlined on the previous page – culture and identity, leadership, investment, teaching and learning, and transition – were discussed by groups of conferees with a focus on three questions:

1. Where are we now?
2. What are the issues?
3. What are some ways forward?

The big idea or compelling variable to these five themes is the significance and role of relationships – relationships between individuals, families, communities, organisations and in the context of the conference, between Community, school and business.

The following sections summarise these discussions.
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Culture, identity and confidence

Where are we now?
Aboriginal and Torres Strait Islander parents, families and Communities want their children and young people to be successful in the western school system AND they want them to know their own culture and have a correlating strong and rich identity. For many students their connections to Country and Community are deep and real. There are students who are succeeding with ‘a foot in both camps’ even when the disparity between their home-lives and mainstream-lives can be extreme.

There are many differences between Aboriginal and Torres Strait Islander communities, cultures and contexts but also many similarities. Culture and identity is itself a diverse issue, for example, between urban and remote environments. For some students this will be about reconnecting with culture and identity and developing their pride as Aboriginal and Torres Strait Islander people and, for others, it will be about experiencing an education and a work environment that values their culture.

Although it is recognised that there are many differences between the contexts in which Aboriginal and Torres Strait Islander learners come from, for many students (strong) language is central to confidence and identity and students can thrive when teachers support the languages students bring to school.

Students find mathematics (and science) to be relevant when it relates to their lives and their culture, when it is useful, purposeful and contextual, has ‘felt meaning’, and can be projected into the future.

What are the issues?
The issues are mostly around the two aspects of culture and curriculum:

1. Elders want students to be successful not at a cost to their language and culture and if family still comes first. Communities are concerned that kids will become ‘alien’ to their ‘first lives’. Some cultural practices such as independence can clash with western education.
2. There are many issues around homesickness and being separated from Country and community when students live away from home and/or Community.
3. The disparity in learning outcomes will not reduce while the curriculum does not integrate Aboriginal and Torres Strait Islander perspectives skilfully and sensitively.

4. Positive cultural identity in schools must be nurtured. Students should not have to defend their culture in a school setting.

5. There is a linear ideology that exists in western education which is not the case for Aboriginal and Torres Strait Islander students. Students can lose their sense of mathematical self through the school system, for example, when western education does not validate different ways of problem solving as a way of engaging students.

6. The linear education system does not accommodate attendance issues.

7. Limited, narrow or negative perceptions of what mathematics is and mathematical identity and confidence.

What are some ways forward?

How can schools change? Can employers change too? Any ways forward must engage with Community. Fundamental to making a difference is:

1. An eco-system of relationships – between Community, school and business; leaders, teachers, mentors, professionals etc - which can support students in different ways including:
   - The issues around homesickness for students who move to other areas for further education need to be addressed
   - Those who are players in this network of relationships respect first (second, third, fourth etc) languages and incorporate these into the curriculum
   - Cultural safety requires skilful leadership. Leaders need to work with Communities to achieve this. They must be able to bring together different groups for the sake of education (See Theme 2).
   - Reducing the disparity between school and community.

2. The key driver needs to be Community recognising what it is they want for their children (assuming that Community members want their children to leave and enter professions outside the community)
   - Stories of Aboriginal and Torres Strait Islander people telling stories of how mathematics fits in their culture - how it helps improve Community economies for example.

3. Schools need to change and become more flexible and responsive and recognise mathematics in culture, celebrate and validate culture, and recognise culture as mathematical:
   - A student’s pride and wellbeing takes priority and needs to be strong to engage in rigorous curriculum
   - Schools need to validate different ways of learning e.g. problem solving
   - Educate teachers about Aboriginal and Torres Strait Islander mathematics (ethno mathematics) and culture and bring it into the classroom
   - Ensure that teaching and learning support and develop cultural identity
   - Whole of student and whole of school approach – identity, recognition and support.
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Leadership

Where are we now?
In looking at the status in leadership that is making a difference to the mathematics learning outcomes of Aboriginal and Torres Strait Islander students, it is important that all levels are considered i.e. Community, education and business and how well they are leading individually and/or collaboratively.

Within Community there are some state based Aboriginal and Torres Strait Islander education consultative groups that have been sustainable and have a history of strong leadership. There are also numerous examples of education leadership in Indigenous Communities across Australia.

In schools, good practice happens where classroom practice aligns with leadership practice and there is school commitment from leaders.

In business, there is a growing focus on leading change which is often generated by reconciliation action plans or social responsibility strategies.

Effective leadership is undoubtedly a forerunner for change and is a recurring theme in making a difference. Skilful leadership means that Aboriginal and Torres Strait Islander students and employees experience cultural safety.

What are the issues?
One of the big hiccups that is preventing Community, education and business from talking and hence collaborating, is that they do not speak the same language. “They don’t understand each other”. Another issue is that schools generally do not teach about business in a way that hits the mark for Aboriginal and Torres Strait Islander students.

What are some ways forward?
We need to break down the siloes between Community, education and business and create an interface or space for the three to translate the different languages each one speaks.
We need a triumvirate of leadership within the eco-system of relationships that inspires Aboriginal and Torres Strait Islander people and those working with them - whether it’s Community, education, or business - to greater heights of achievement.

Each sector could be responsible in different ways. For example:

- a) Community is responsible for leading the aspirations e.g. scholarships and developing the cultural language.
- b) Organisations that work with Communities and employ people need ensure Aboriginal and Torres Strait Islander employees stay strong in culture.
- c) The vision for leadership is set by Aboriginal and Torres Strait Islander people.

- In schools, quality teaching and learning embeds cultural perspectives, leads change, is relevant to context and gets kids ready for careers.
- Business is responsible for providing safe spaces (culturally safe) for Aboriginal and Torres Strait Islander people, “where we can be ourselves”, and access to careers are supported as well as pathways. Business must lead investment in education internally and externally.

Integral to successful leadership are the relationships between Community, education, and business. Discussing and defining responsibilities both collectively and individually as leaders, and communicating effectively and productively, is an essential element of the eco-system of relationships.
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Transition
An Aboriginal and Torres Strait Islander person may experience different types and levels of transition at many points or steps in their life as illustrated in the diagram below. What is apparent is the ‘ecosystem of support’ that helps people move through these transitions so they are ‘math-ready’ at any(transition) step along the way.

Diagram 1: Maths ready in a stepped learning environment during transition steps

Where are we now?
Defining ‘transition’ refers to a number of aspects of an Aboriginal & Torres Strait Islander students’ educational pathway. The most obvious transition steps are those from home to school and from home to tertiary institutes. There are also transition steps between education cultures i.e. from primary to secondary schooling to tertiary education.

On another level there is the transition from fear to curiosity to action. For students to be maths-ready at any of these points along their pathway, their chances of successful outcomes are improved within a stepped learning environment. This is illustrated in Diagram 1 where the steps represent each of the levels students engage with as they go through possible cycles of fear to curiosity to action along the way.
What are the issues?
The diagram provides a valuable framework for considering the transition issues for Aboriginal and Torres Strait Islander students in mathematics education. If the steps represent the levels of education, the most prevalent issue is that students are continually being placed in environments where teachers are at rather than where students are. In many schools across the country there are teachers who are teaching out of their field or specialisation and are not competent and this can be particularly so in mathematics. Chances are that this is even more prevalent in schools that have Aboriginal and Torres Strait Islander students. The level of frustration can be rife for both teacher and student!

There are many other issues:

1. The evident division in teaching in secondary where there is cohesion in primary (in teaching styles) and in teachers working together.  
2. Students are ready at different times – for whatever reasons. They need time to consolidate as they move through transition steps. These steps - between home, school and tertiary, career sectors - need to be smoothed for, and with, the students. More needs to be done to improve the transition between students leaving their home environment to go to school. For example, parents need to feel comfortable engaging with schools and schools need to provide a space – we are calling it a ‘3rd space’ - where parents and schools come together. This approach will build relationships between home and school – making it comfortable for parents to engage and become involved, and for schools to learn more about families etc.
3. Some students do not have the resilience to cope with the transition steps and do not feel that it is okay to fail, to pause and develop confidence before moving on. At these transition steps we need to create comfort zones or safety blankets for students.
4. There can sometimes be a “nasty” side to opportunity - where the employer is looking for a statistic to make them appear good - people are offered positions but don’t actually have the skills.
5. Students need to have time to practise their newly learned skills. A fault with Australian Curriculum is that it is so full there is not time to do this.
6. Students need to be able to see and feel that they are learning.
7. Shift away from grades.
8. There is a dearth of research about the 3rd space where parents and schools come together (e.g. how schools report to Aboriginal and Torres Strait Islander parents).
9. There is often stereotyping about Aboriginal and Torres Strait Islander students which can lead to misnomers and generalisations. There can be vastly different experiences for urban and rural students e.g. in connections to Community and Country.
10. Issues with transition for students between a school and business partnership. Schools must help students get ready for the opportunity in cadetship, scholarship, apprenticeship etc.
11. Often the leadership in schools is not invested in transition.

What are some ways forward?
Organisations need to change ie at school and business levels. We can see the potential for some very positive ways forward and this will begin with improved relationships between schools and business and an intersection between leadership from both for students’ transitioning.
1. Leadership in schools must be fully engaged with a committed effort. “We want the best for our students and ensure they succeed.” This will include following up with students when they leave school.

2. Research that identifies what works and doesn’t at transition points/steps

3. Identifying successful models around the country and emphasise these, for example, the Koorie academy model – program (see Mark Rose presentation)

4. Destination tracking – students that are transitive/mobile and supporting them in their moving. Further to this, follow up of students 2-3 years on – similar to what happens at Immanuel College. Consider new ways of education tracking and tracking competency

5. Smooth the transition steps for the student and continue it ‘around’ so students see themselves as lifelong learners. An example of this could be linking business to education to business and then linking back to Community with students engaged in a lifelong learning process

6. Identifying and accessing resources from government and business that can help smooth the transitions

7. There are some peer relationships and mentoring programs working well. We need more mentors – a critical mass - to create a ripple effect; Connect mentor program at University (eg AIME?)

8. Programs that give school students experience in university

9. Role models: more role models made more prominent and at various transition steps. Role models from secondary who go in to primary schools – work all the way through from home to school to work etc.

10. Create an alumni culture within schools where Year 7s go back to primary school and university students got back to secondary school. This will enhance the transition process for students from the other direction but also helps to form the eco-system of support that students might need

11. Consider an ambassador program?????

12. Working with students at different stages in resiliency training and accepting that ‘failure is ok’, that we learn from mistakes as well as our successes

13. There always needs to be a Plan B just in case Plan A does not work

14. Qualifying people (and resourcing) who are skilled to specifically work with Aboriginal and Torres Strait Islander students to provide career advice

15. Rather than students be placed in a level where teachers might be at, teachers are put in the level that students are at

16. Transition is usually linked to change and change can be positive therefore rather than viewing transition as a hiccup or an adversity, the flipside is looking at transition as a positive. There can be many important transition steps for people – getting them at the right times so they can make the transition will make a difference.
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Investment
There has been much good work by many people across Australia to ‘close the gap’ in education and in other areas such as employment and health. However, there remain striking disparities between Aboriginal and Torres Strait Islander people and non-Indigenous people especially in economic inclusion and community economies. Increasingly, business and industry are investing in people, projects and plans to at least halt this growing disparity.

When we refer to ‘investment’, what do we mean? It’s not always the mighty dollar. It also means investment in the local community, in relationships, and in generosity of spirit. It’s about building social capital in communities and creating business investment in education.

Where are we now?
Currently, the effort, energy and passion of individuals is “near tipping point” in many situations. For example, generosity of spirit is not sustainable. Passion is not sustainable; in schools, all too often, we see passionate teachers eventually ‘burn-out’.

There are many initiatives that are funded, and certain amounts and types of funding available, but any funding is considerably diminished due to red tape and bureaucracy ‘clipping the ticket’ at every level.

What are the issues?
Many of the issues outlined below relate to resourcing:

1. We are all asked to do more with less
2. Maintaining a digital connectivity/forwardness. Rural and regional Australia is getting further away from metropolitan Australia. The digital divide between the two is another ‘gap’.
3. Less resourcing (including humans): Rural, Remote and Regional resourcing needs to be a compelling offering and consideration needs to be given to these locations to ensure continuity and succession planning. We note that some bespoke programs are having some success; they are however not a scalable way forward.
4. Remote schools that don’t have eldership, leadership – what happens to them?
What are some ways forward?

Investment by Community, education systems and business in and through each other will contribute to ensuring the prosperity of Aboriginal and Torres Strait Islander people.

**Key to success include:**

1. Digital adoption and connection – more help to more people (scalable)
2. Consolidation of project funding for scale – how do we consolidate the dollar to spread further? Investment that is scalable
3. Best practice adoption with resources
4. Longitudinal studies with long term reporting to determine the investment success. This would include an investment protocol to consider long term, meaningful outcomes to do more for more than one group
5. Empowering communities - Indigenous students to be empowered by maths and gates opened to them so they are better positioned to make a difference to their communities, organisations and systems in which they work, and their worlds.

The timing is ripe to explore the nexus of school, home, community, and business in the context of Indigenous achievement, community development, and business development and what the possibilities might be for the relationships between them to build bridges. A partnership of these Community, education and business will push for social and cultural justice so mathematics can be used for ‘the purposes of empowerment at both the individual and community levels’ (p. 220, Nasir et al 2008).

‘Business’ is now realising the need to increase focus on maths, particularly to the poor levels of uptake of STEM based scholarships and cadetships offered through RAP’s. The private sector in particular is always focused on problem solving in pursuit of competitive advantage. This outlook is new to focusing on Indigenous disadvantage and holds much promise.

Investing in the nexus of school, home, community, and business in the context of Indigenous achievement, community development, and business development offers some exciting possibilities.
Aboriginal and Torres Strait Islander Mathematics Alliance

Quality teaching and learning
We know that quality mathematics teaching equates to quality mathematics learning but what does this specifically and especially mean for Aboriginal and Torres Strait Islander students, their teachers, schools, families, communities, business and beyond?

Where are we now?
The current status is wide and varied and this in itself is part of the challenge but also part of the solution. But first, what do we know:

1. That Aboriginal and Torres Strait Islander students generally are two years behind their non-Indigenous counterparts in Australian Curriculum Mathematics (ACM) outcomes by year 3 and this trend continues throughout the remainder of schooling (NAPLAN)
2. Career pathways for any students are limited if they do not have the mathematics
3. There are mentors and tutors encouraging students to do higher mathematics
4. There are mathematics faculties in schools driving change in pedagogy, in what mathematics looks like in the classroom, and in the importance of maths.

What are the issues?
When considering the issues in quality teaching and learning of the ACM, these are wide and varied. Generally, they are about attitudes to mathematics; teacher capacity to teach mathematics in responsive ways (culturally, socially and academically); appropriate professional learning for teachers; a culture of underperformance in teachers and students (and schools).

1. Attitudes towards mathematics:
   - Dispositions, attitudes, recognising mathematics, perceptions of, and fear of mathematics are major issues for students, teachers (and parents/families).
   - When teachers are anxious about the teaching of mathematics, Aboriginal and Torres Strait Islander students are possibly more perceptive of and receptive to teacher anxiety and pedagogy. When students become anxious about mathematics they can be easily turned off or become disengaged from mathematics
Mathematics can be perceived as being ‘not important’ and is therefore not pursued.

- Parents can have that attitude that ‘I was bad at maths, that’s why you are’.
- Cultural acceptance of ‘bad’ at maths

2. Teacher capacity:
   - Generally, teacher capacity is not at a level it should be – there is a lack of professional learning around Indigenous students and mathematics; teachers ‘scared’ or lack of knowledge of teaching maths (especially primary but also in secondary)
   - Lack of knowledge of Indigenous students
   - There is not the workforce
   - Wide range of ability in classroom
   - Lack of good teaching pedagogy

3. A culture of underperformance:
   - We continue to see an underperformance of students, of teachers, and of schools, a culture of underperformance; interventionist, deficit and underperformance, low expectations; not looking to extend
   - Focus on vocational rather than more academic
   - Blaming underperformance on student (in the main)

4. The mathematics curriculum:
   - There is an impenetrable curriculum further hindered by the expectation for differentiation of curriculum that caters for a diversity of learners

5. Data:
   - In some schools and tertiary institutes, Aboriginal and Torres Strait Islanders students are being encouraged not to do mathematics for various reasons e.g. the school wanting to ensure they have good test results (e.g. Year 9 NAPLAN)
   - Underachievement in maths – NAPLAN / PISA.

What are some ways forward?

By looking at the current status in quality teaching and learning and the range of issues, finding ways forward fall into several categories: mathematics education; leadership; teacher responsiveness; professional learning; student pathways. To ‘close the gap’, plans in schools must include recognised, ongoing professional learning for all educators that places mathematics education and quality teaching of mathematics as a priority.

1. Teacher responsiveness to Aboriginal and Torres Strait Islander students and families/community:
   - Greater collaboration between teachers,
   - We need more teachers to be culturally proficient, aware of richness of Indigenous knowledge
   - Community agreement in schools
   - Pathways for students into (?????) teaching (maybe link with business).

2. Professional learning of teachers:
   - Mathematics content knowledge of teachers – deep knowledge of maths and maths teaching – needs to start early i.e. in primary school
   - Maths teachers accredited to teach maths
   - Teachers to re-experience maths teaching
   - Look at teacher training
   - Use AAMT to be the conduit to support all teachers – resource / guidance / PD e.g. Science Assist
Snapshots of excellence need to be made available to everyone. But also more than just viewing — foregrounding and reflection
Aligning mathematics learners, culture and professional standards to identify teacher learning needs.

3. Mathematics education
- Lift status of teaching especially maths
- Numeracy coaches linked with business
- Teachers have resources that unpack the Australian Curriculum (AC) to help/support all teachers (especially non-maths teachers) to teach the AC. “what does it look like in their classroom?”
- Teaching and learning that scaffolded and explicit; use of “relate-able” tasks – concrete, practical application that connects to experience
- Recognizing mathematics as important.

4. Leadership in schools
- High quality curriculum people in administrative positions
- Recognition of quality maths teachers and pathway into leadership positions
- Principals need to be on board.

5. Assessment
- An assessment tool (non-NAPLAN style) that shows the student/teacher has value-added
- Assessment practices in schools provide opportunities for oral answers.

6. Other:
- Development of teacher workforce – e.g. a network of ‘high performing teachers’ in maths education for Indigenous students is created and remunerated at higher level than other teachers
- A network of powerful and successful school leaders whose schools have achieved parity in maths outcomes is formed and mentors other school communities. The network would also produce resources and support programs for leaders to target improved maths outcomes
- Partnership between ‘us’/university/business to put pressure on government
- That a national strategy is put in place to catalyse and coordinate any work done in this area and connect projects to continually develop maths practices and approaches, and learning programs. These are made available to all schools with ongoing professional learning to implement these effectively through evidence based practice. Any such projects must have ‘a clearly measurable performance path agreed to at the beginning of the project’
- That the juxtaposition of Community, education and business is investigated and supported as a way forward to building teacher capacity. Because of the spread of schools and communities – from very remote to inner city – the creative and innovative use of technology to connect with and between schools and their communities and business will be essential.
Part 2: Conference Proceedings

Part 2, the Conference Proceedings, provides the abstracts from the presentations with links to many of the presentations and conference papers.

Introductory remarks

Dr Chris Matthews

ATSIMA’s First Conference

• The Pipeline…

Responses from conference participants (10 November 2014):

> (I) think the idea of a network of relationships rather than a pipeline is great and an important challenge to current thinking. (Conference participant, 10 November 2014)

> I believe the opening address from the chairperson was valuable as he put things into perspective and the way he did can be used across all communities.
Keynote 1:

**Professor Ian Anderson**

ATSIHEAC provides independent advice to the Australian Government on Indigenous higher education, including progressing the agenda set by the 2012 Behrendt Review. A priority for ATSIHEAC is to get vastly greater numbers of Indigenous people into the professions. In particular, persistently low levels of participation and success in STEM-related professions profoundly limits the impact that Indigenous people can make within their own communities and in the economy more broadly. Professor Anderson has a wealth of experience in Indigenous medicine, a sector that has made significant gains through powerful collaborations and strategic interventions. He will discuss the work being done by ATSIHEAC with university faculties to accelerate change in the STEM disciplines. The extremely low participation in mathematics amongst Indigenous students is of particular concern.

**View presentation:**
http://www.slideshare.net/catymorris/20141110-presentation-to-atsima

Responses from conference participants (10 November 2014):

- Thanks very thought provoking - makes me think about social culture of my colleagues in adult ed LLN who generally come from a humanities/s social background and focus much more on literacy than numeracy - need to encourage more maths people and work out how to incorporate numeracy into literacy education.

- Maybe there is more Indigenous students in the Arts disciplines rather than the Maths/Sciences disciplines as students do not see the connections to culture and community? We need to make sure these courses are making these connections.

- Interesting to hear of importance of pathway from school to TAFE then possibly to Uni I see many TAFE students coming to Uni for engineering degrees and they need a lot of targeted individual support and encouragement to build their maths skills and confidence.

- Encouraging to hear of the initiatives in higher ed to increase Aboriginal and Torres Strait Islander engagement in degrees in STEM. Dialogue with deans...
Keynote 2: Why Blackfellas should read Plato

Prof. Mark Rose

Prof Rose was a last-minute stand in for Keynote 2 as the proposed presenter had to withdraw from the conference. Therefore, there is no abstract for the presentation.

View presentation: http://www.slideshare.net/ATSIMA/rose-43106389

Responses from conference participants (10 November 2014):

> Powerful message of the surreal nature of Australia today and what this means for us as a Nation.

> Work systemically to build capacity in every educator.

> Compelling and clever global thinker - the challenge of crossing the boundary road and thinking about what this might mean in my work.

> Inspirational talk and ideas to take back and revitalise my workplace and continually challenge staff and students to strive for higher goals than maintaining fringe.

> Excellent keynote. Much food for thought re future planning for Indigenous kids and STEM.
Community Voice
Responses from conference participants (10 November 2014):

> The knowledge and skills (and time) required by students (and parents) to successfully navigate secondary schooling and beyond is not innate. KAEs aims and strategies are on the right track.

> How do we work with the young people to seeing themselves in the learning and then want to realise it.

> It is important that diverse educators see themselves in the change. Further being able to talk through what it is they are doing and why as well as where to next.

1. Connected Communities

*Michele Hall & Cindy Berwick*

The Connected Communities strategy is the NSW Department of Education and Communities (Australia) major reform in relation to Aboriginal Education and Training from Early Years education through to post school options and pathways. It was initiated from the Aboriginal community’s determined advocacy and mounting desire for genuine educational transformation and change, within a respectful, culturally inclusive framework. Essential features of the strategy are Community engagement and co-leadership, Aboriginal languages and Cultural studies and curriculum innovation and reform. The presentation will examine the key foundations of the strategy, processes and procedures undertaken to initiate change and the future actions required to realise its full capacity. It will showcase a current initiative being undertaken by Taree High, a Connected Communities School that has successfully combined all three elements of Community, Culture and curriculum to create a culturally inclusive math’s program.

*View presentation:* [https://custom.cvent.com/AC1461E6AC63400FB8AAA2E83F2C2C45/files/event/1E394663FAA2467A88AE25A5CB56F009/9c156fd2364445c6855304e1c446486b.pptx](https://custom.cvent.com/AC1461E6AC63400FB8AAA2E83F2C2C45/files/event/1E394663FAA2467A88AE25A5CB56F009/9c156fd2364445c6855304e1c446486b.pptx)
2. A community leader’s perspective

**Harry Miller**

In this presentation Harry talks about his experiences and journey in formal education and in life. He discusses schooling from grade 3 to year 12 and the impact his relationships with teachers had on him. This is followed by an outline of his career pathway and the events that shaped him and his life. He discusses the most important things in getting to where he is today - respect for your fellow human beings and caring about what it is you are trying to achieve, be it in work, home with family, or community capacity development. Harry draws on all of these to explain his aspirations for Aboriginal Communities in relation to education and the role of the Community and school to achieve these.


3. Mathematics and academia inside and outside the classroom

**Rebecca Richards**

Rebecca is the first Aboriginal person to win a Rhodes scholarship. In this presentation, Rebecca discusses her academic pathway to gaining a PhD in Anthropology. She takes us from everyday knowledge growing up on a fruit block to Adnyamathanha and Barngarla homelands to museums and beyond. She touches on such topics as Women’s Dreaming sites, National Museum Australia Cadetship work, archival histories, the Smithsonian Institution National Museum of Natural History, observations of bark paintings collected in Arnhem Land, and the 1948 Australian-American Scientific Expedition to Arnhem Land. The presentation is full of beautiful images and representations of her learning with acknowledgements given to the many people including teachers who been a part of this. Rebecca’s presentation provides powerful insights into an Aboriginal student’s life and commitment.

*Download presentation:* [http://www.slideshare.net/ATSIMA/richards-43107381](http://www.slideshare.net/ATSIMA/richards-43107381)

4. The Koorie Academy Of Excellence

**Mark Rose & April Pender**

The Koorie Academy of Excellence (KAE) is a joint initiative between VAEAI (Victorian Aboriginal Education Association Incorporated) and NMR DEECD (Northern Metropolitan Region – Department of Education and Early Childhood Development) and the program is being funded by State Education (DEECD) Northern Metro Region with partners that include La Trobe University and Mission Australia. The KAE aims to nurture the next generation of Koorie leaders, academics, artists, athletes, politicians and role models. The Koorie Academy of Excellence (KAE) began in 2012 and is now the second largest Koorie cohort in the state.
Although high academic achievement is not a prerequisite of the program – entry is also based on students’ interests, talents and strengths, as well as attitude, effort and attendance – the aim of the KAE is to keep students excited about their future and committed to completing school and pursuing university.

5. **Building cultural competency in our STEM students: The UniSA Indigenous content story**  
   
   **Andrea Duff, Mark Osborne & Lesley A. Ward**

   The Indigenous Content in Undergraduate Programs (ICUP) policy at UniSA makes Aboriginal history, culture and professional practice a compulsory part of all undergraduate programs. ICUP is embedded in Computer Science, Science, Engineering, Construction, Aviation and Mathematics. Since 2010, we have reached more than 2500 students, who have reflected on their cultures and the professional relevance of cultural diversity; built websites for Aboriginal organisations; created culturally appropriate engineering solutions and engaged people across industry and communities. We will discuss community highlights and how one course, Mathematical Communication, uses a variety of strategies to embed Indigenous content into the STEM curriculum.

   **View presentation**
   [https://custom.cvent.com/AC1461E6AC63400FB8AAA2E83F2C2C45/files/event/1E394663FAA2467A88AE25A5CB56F009/ed60d8e0d73d4129aacd90e14796005e.ppt](https://custom.cvent.com/AC1461E6AC63400FB8AAA2E83F2C2C45/files/event/1E394663FAA2467A88AE25A5CB56F009/ed60d8e0d73d4129aacd90e14796005e.ppt)

   **View paper**
   [https://custom.cvent.com/AC1461E6AC63400FB8AAA2E83F2C2C45/files/4e50e1919498446c9a32160f63296553.docx](https://custom.cvent.com/AC1461E6AC63400FB8AAA2E83F2C2C45/files/4e50e1919498446c9a32160f63296553.docx).

6. **Holistic Mathematics Without Restrictions**

   **Gail Clark**

   I will show a power point on how we as teachers need to apply an integrated way of teaching math to our Aboriginal and Non Indigenous students that is relevant to employment outcomes when they leave school. It is the twenty-first century and we need to have a relevant teaching attack to give our students a pathway to employment and higher education. From an Elder’s perspective I am dedicated to getting our children to a level of education that will see them out of the welfare cycle and into employment of their choice.
Tertiary education
Responses from conference participants (10 November 2014):

> Strong message to build culture and identity for engagement. Need a focus on well mapped developing resources that support this.
> Numeracy framework with linking of maths and cultural identity.
> Indigenous voice to be able to access models of how the mathematics fits into their stories.
> Importance of online resource access. Create compelling narratives with maths learning that young people want to see themselves in and support them to realise this.
> The connection between uni and School is tenuous. How do tertiary build experience and awareness of uni before they reach senior years.
> Funding uncertainty is a struggle but good things are happening anyway. At year twelve if they have to choose what they are going to do then they go to what is familiar. Highly personalised and supportive Programs. Limited numbers. Not entertainment Programs.
> The ways maths is taught can be culturally loaded therefore alienating for Indigenous students. Far more sophisticated and sustained induction and support for teachers at remote schools.

Primary maths for Indigenous Australian VET learners - strong in pedagogy; strong in culture

Mark Linkson

RATEP is a community based Indigenous teacher education program that has deliberately sought to use culture in curriculum as a means to engage Indigenous students, both spiritually and academically. Many of our TAFE course units combine Indigenous and Western knowledges. This aims to give RATEP students the confidence to work as teachers proud of...
their Indigenous heritage and able to use it within their pedagogy while maintaining academic rigour and curriculum outcomes. This session will focus on the creation and delivery of our maths unit AIEEDN501A Develop workplace numeracy and teach mathematics in Aboriginal and Torres Strait Islander contexts, exploring the overarching framework and highlighting those strategies which have resulted in a course which fulfils what some may see as contradictory aims.

View presentation
https://custom.cvent.com/AC1461E6AC63400FB8AAA2E83F2C2C45/files/event/1E394663FAA2467A88AE25A5CB56F009/267535edc73d491bb0fad4e2cb72de26.pdf

7. Piquing the curiosity

James Gett & Jo Ruddy

At Tauondi Aboriginal College most of our students come to us with a strong aversion to maths. Over the last year we (Jo Ruddy and James Gett) have been adapting the maths curriculum of the numeracy program in an effort to spark our students’ interest in mathematics and overcome their hesitations and trepidations. We have succeeded in piquing our students’ curiosity by integrating creative thinking, history and hands on learning. Our project based curriculum supports what we have found is important to our students. Land, community and a deadly feed. We look forward to sharing our story and learning processes with you.

8. Teaching numeracy in remote and very remote contexts

Robyn Jorgensen

This presentation draws on the emerging trends from an ARC project which is documenting practices in remote and very remote schools where there has been successful outcomes. The study is ethnographic and develops case studies of sites across Australia. The cases that are emerging are very different but there emerging themes across the schools, states and contexts. This presentation will discuss some of these emerging trends.

9. Exploring the mathematical confidence of Indigenous pre-service teachers in a remote teacher education program

Steve Thornton

...most of our students come to us with a strong aversion to maths...

...mismatch between Western and Aboriginal ways of thinking in
This presentation reports on the efficacy of an accelerated teacher education program (Growing Our Own) focused in remote Indigenous communities in the Northern Territory. The program is a joint initiative of Charles Darwin University and the Northern Territory Catholic Education Office, providing an intensive two-year program designed to educate Indigenous Teacher Assistants to full teacher status. I describe the growth in knowledge and confidence that has occurred through the program using the story of one of the students in the project, and how at the end of the program she was able to challenge her previously accepted role as subservient to the non-Indigenous teacher. The discussion highlights some key issues for improving outcomes for Indigenous children, including the potential mismatch between Western and Aboriginal ways of thinking in mathematics and developing the mathematical capacity of Indigenous teacher assistants in remote settings. I suggest that the mutual respect of the participants at various levels of Growing Our Own, the situated and purposeful nature of the learning, and the capacity of teacher assistants to engage in that learning without abandoning their community responsibilities have been pivotal in the success of the program.

View presentation
https://custom.cvent.com/AC1461E6AC63400FB8AAA2E83F2C2C45/files/event/1E394663FAA2467A88AE25A5CB56F009/2851c6a33ecd4a8ea9200c7b44fa25bf.pptx

10. A gateway through statistics

Prof. Mark Rose

Aboriginal and Torres Strait Islanders students are completing Year 12 in unprecedented numbers. Tagging them ‘first in family’ possibly doesn’t capture the significance they present for they have broken a cycle that had relegated generations before them to the fringe of curriculum. As a consequence of that ‘fringe’ the families of today’s year 12 students often have had very little experience of the vagaries inherent in the compulsory and tertiary years of education. Often on advice by well-meaning educators Aboriginal and Torres Strait Islanders students are encouraged to drop mathematics along the way to year 12. This means on the threshold of tertiary education their options are reduced for lack of mathematics pre-requisite. La Trobe University in partnership with the Koorie Academy of Excellence is developing a gateway mathematics subject. With similarities with the ‘early college’ model in the United States the subject will give initially the Koorie Academy of Excellence students an opportunity to complete a university subject before they complete year 12. The subject revolves around solving problems by statistics including probability and carries the rigour of a first year subject with an Indigenous focus and delivered in an intensive format. What the subject will do is to exponentially increase our students’ options and career paths.

View presentation:
https://custom.cvent.com/AC1461E6AC63400FB8AAA2E83F2C2C45/files/event/1E394663FAA2467A88AE25A5CB56F009/00c83f8073424660989791acffe42fe.pdf
11. Improving the teaching of mathematics in elementary schools in PNG using language and cultural practices

Kay Owens

There are challenges to understanding and acknowledging cultural mathematics and how this might impact on school mathematics education. This presentation will provide some of the insights and ways in which this Papua New Guinea project has considered this issue. The results of workshops already undertaken on these lines suggest the approach is worthwhile in maintaining identity and providing a tool for such an approach. There are many examples that we have collated for practice.

View presentation: https://custom.cvent.com/AC1461E6AC63400FB8AAA2E83F2C2C45/files/event/1E394663FAA2467A88AE25A5CB56F009/77409e2615f44fc98c082737a41e98ba.pptx

View paper: https://custom.cvent.com/AC1461E6AC63400FB8AAA2E83F2C2C45/files/e2e770fe5d324130ba639f9983a790eb.docx

12. Finding a middle way: Learning western mathematics and staying solid in culture

Prof. Tom Cooper

Elders state that they want their young people to have the strongest mathematics but remain solid in their culture. Since the late 1990s, the YuMi Deadly Centre has based its mathematics projects on a special pedagogy, called YuMi Deadly Maths and developed in collaboration with Dr Chris Matthews that begins from cultural background, builds deep structure and uses decolonising methods. This presentation will look at YDC's implementation of this pedagogy and discuss the tension, looking for solutions, that exists between the mathematics knowledge, the ideologies that imbue its teaching in western schools, and the culture and learning style of Aboriginal and Torres Strait Islander students.

View paper: https://custom.cvent.com/AC1461E6AC63400FB8AAA2E83F2C2C45/files/9d9d87ff94754ec2a1cd9ae43e885d97.docx

13. Supporting assistant teachers in number knowledge: A language and cultural context

Chris Walta

The presentation tells the story of a PhD research study that resulted from my participation in a three year project in Arnhem Land focusing on supporting assistant teachers in understanding student number knowledge. A central part of the project was valuing the role of first language. My work in the project led me to question what was and was not possible in the language and cultural context. A drawing approach was designed that enabled listening to what was valued by the assistant
teachers. A brief overview of the drawing approach and analysis is included in the presentation.

Schooling
Responses from conference participants (10 November 2014):

> Who are we? What do we do? How do we know we are successful?
> Very interesting set of networks and drive. Good balance of culture and STEM. How do they come together?

14. BHP project for Aboriginal and Torres Strait Islander students in STEM

*Marian Heard*

The BHP Billiton Foundation is funding a new $28.8 million, five-year project to improve the participation and achievement of Aboriginal and Torres Strait Islander students in science, technology, engineering and mathematics (STEM). The project, which is being managed by CSIRO, is providing supported pathways that aim to increase Indigenous representation in STEM-related professions. Recognising the fundamental importance of Indigenous culture and identity in student achievement, a strong cultural, as well as a rigorous academic focus, is guiding the development, implementation and evaluation of the project. Participating schools with relatively high Indigenous student populations will be selected from across Australia, including in metropolitan and regional areas as well as remote communities.

15. Modelling successful Indigenous Summer School

*Rob Ball & Ian Maynard*

This presentation will share the features that have contributed to the ASSETS program (Aboriginal Summer School for Excellence in Technology and Science) becoming a nationally recognised highly successful entity. ASSETS is a fully funded, residential, 10 day program engaging the 30 participants from all over Australia in an Inquiry based journey of discovery. Factors that underpin the program’s success include: It is supportive and highly personalised from the initial and on-going relationships with the families to the boarding facility used and the program activities. Pedagogy that demands engagement and the need for outcomes challenges participants and keeps them involved while the Cultural and Leadership strand builds their awareness and confidence as Aboriginal or Torres Strait Islander young people.
16. High expectation program at Immanuel College

*Kevin Richardson (and students)*

This presentation will focus on the success of the Immanuel College Indigenous Youth Leadership program which has been operating for many years. The program is unique in the way we manage and mentor students from remote and isolated communities. The session will be presented by Kevin and two students.

17. Using online learning to increase student engagement and success with mathematics

*Dean Thomson*

‘Mathletics’ is an online learning platform that is successfully engaging students and increasing their opportunities for success with Mathematics at Worawa Aboriginal College. This presentation will discuss how Mathletics can be tailored to enhance the learning needs and goals of Indigenous students, increase their learning confidence through success and allow for a more targeted and personalised learning approach. It will also include ideas about tailoring the Mathletics course to support a culturally responsive curriculum. Evidence will be presented which suggests that online programs such as Mathletics can dramatically improve students’ numeracy success within months. Reflections on pedagogical practice in Mathematics classes generally that impact positively on student results will be discussed.

*View presentation:*
https://custom.cvent.com/AC1461E6AC63400FB8AAA2E83F2C2C45/files/event/1E394663FAA2467A88AE25A5CB56F009/1cb45d57ba6d47adaf4c2ea6f012d553.pptx

18. Numeracy, mathematics and Indigenous Learners: What are the Cluster Findings from the Make It Count project and what do they mean for teaching and learning

*Caty Morris*

The ‘pedagogic dance’ between teacher and student is core to improving maths outcomes of Aboriginal students. In the AAMT Make it count project, teachers’ stories about their ‘dance’ provided rich data for the project’s Cluster Findings. These findings were organised to reflect the Australian Professional Standards for Teachers in relation to professional knowledge, practice and engagement required for improving maths outcomes for Indigenous students. Participants will be introduced to these important Cluster Findings and my thinking about Responsive Mathematics Pedagogy that in academically, socially and culturally responsive to Aboriginal & Torres Strait Islander students and their learning needs.

*View presentation:* http://www.slideshare.net/ATSIMA/morris-43106989
*View handout:* https://custom.cvent.com/AC1461E6AC63400FB8AAA2E83F2C2C45/files/4d3dacc5603c4c9b8b88e7d541cc7247.pdf
19. Aligning the stars for urban Indigenous students to achieve in mathematics

*Tracey Armstrong*

Indigenous students achieve success in mathematics when all their stars are aligned. Swan View Primary is regarded as a low socio-economic school with an array of multiple impoverishments. To help our students shine in this challenging environment, we aim high, reaching for the stars by providing not only quality teachers with sound professional knowledge, but rigorous teaching, engaging experiences, high expectations and thorough planning, complimented with positive relationships. All of this is built upon by implementing dynamic feedback. These are the guiding stars we aim for in the universe of cultural awareness that is our catalyst for achievement.

*View paper:*
[https://custom.cvent.com/AC1461E6AC63400FB8AAA2E83F2C2C45/files/1d53c34a6d7b482d94edbef93fb5172f.docx](https://custom.cvent.com/AC1461E6AC63400FB8AAA2E83F2C2C45/files/1d53c34a6d7b482d94edbef93fb5172f.docx)
Business Panel
Responses from conference participants (11 November 2014):

> Where are the kids? Difficult to find students to accept opportunities because there are not enough students with STEM skills. Need to intervene in school sector.
> I am really interested in all the initiatives being taken by business and want to know where to start within my own system: education.
> Difficulty for business and schools to have good connections. Important to make these relevant.
> Move beyond cultural awareness towards cultural competence - making Aboriginal children feel safe.
> Indigenous friendly workplaces.
> Working with families not with individuals.
> Transition between School and university working with family and community.
> Future relies upon all students including Indigenous students - they need interest and success from the beginning of school.
> Talent incubation from kindergarten.
> Gender and the momentous plays in STEM.
> The imposter syndrome - keeping aware of this and giving support
> Background, talent, confidence, grit.
> Research in early childhood in mathematics. Business could look at investment in this area.
> If you are the first to consider uni, you have a big challenge.
> Uni as an option - how do we support people to see themselves in the picture. What relationships and questions need to be asked?
> If you are a mature age woman, what are the things you see?
> Getting the ball to the full forward.
> Teacher as connector.
> Challenge the notion of Educator having to be an expert and identify with maths as they can connect to experts through the digital world and this is a way business could support what Google Apple and Microsoft are doing in these spaces. Let’s make the connection.
> How do we provide the capacity in educators to support the learner to see themselves in STEAM AND STEM.
> Where are the voices of the young people in all this? Something for consideration as the outcomes of this conference are progressed
> School based traineeships time away from school - need some residential blocks.
> What does an ecosystem look like as an alternative to the pipeline?
> How do we connect young people with peers who are making progress and promote this in schools?
Part 3: Conference evaluation

Feedback about the conference was an important step in gauging the impact the conference might have had on participants, and also on the appropriateness of future such events.
Up to 42 participants took part in the survey - nearly half of the participants - a great effort given the time of the year!

1. **The Community, Tertiary and School presentations overall were successful?**
   a. 14 participants Strongly Agreed
   b. 21 Agreed
   c. 5 were Unsure

2. **For you, what was the standout Community, Tertiary or School presentation and what was so good about it?**

   “Each made a connection with me. “

   - The Immanuel college presentation was excellent. It demonstrated the connections the school has built with the students, their families and communities. I was particularly impressed with the salary which will be put in to support students for the first two years into university.
   - I enjoyed listening to the principal and students from Immanuel College in Adelaide speak. Again, very interesting but I couldn't really apply their message to the context of our school
   - The principal talking about his Lutheran school in Adelaide. Great to have the students present and all three spoke very well.
   - The case study from Tracey Armstrong showed what needed to be done and how to do it. It was also a model of teacher dedication.
   - Although it raised more questions than answers for me I thought the Western Australia school was thought provoking and provocative. Gave me some insights into some questionable practices in terms of equity - but presentation was good. Good energetic discussion afterwards.
   - I believe the opening address from the chairperson was valuable as he put things into perspective and the way he did can be used across all communities.
   - Community: Koorie AE Tertiary: Tom Cooper School: BHP STEM
   - The one about case studies of successful remote schools
   - They were all so informative and worth hearing for different reasons. No one presentation stood above the others
   - There was not one particular presentation, rather I took strategies from all to provide a new conceptual framework for my own thinking and practice

*I took strategies from all to provide a new conceptual framework for my own thinking*
Our community needs to be more pro-active in getting our Indigenous kids to school.

Mark Rose very thought provoking and important advice to inform out work. Excellent presentation.

the man who spoke on his 60th birthday totally inspiring

Mark Rose - An inspiration and so clearly passionate. Said it how it really is!

2 people from college in Pt Adelaide - interacted with crowd and didn’t rely on powerpoints

School presentations were more relevant and most informative given that I am a teacher.

Ian Anderson’s keynote gave me really useful perspectives in my role in curriculum to discuss with school leaders and teachers particularly around moving well performing Aboriginal students forward.

NSW Community and Schools

YUMI Deadly provided a culturally engaging pedagogy that not only engaged all learners, but also provided support for gifted students - very impressive and want to see more.

The joint session on Monday about ‘The Koorie Academy of Excellence’ (Mark Rose & April Pender) and ‘Holistic Mathematics without restrictions’ (Gail Clark). Personally it was the most relevant pair of presentations to what we do at UniSA Connect so it was great to hear some other perspectives on methods of connecting with Indigenous youth and teaching mathematics in interesting and relevant ways.

The Koori Academy of excellence

The Koorie Academy of Excellence - Mark Rose & April Pender. A realistic program that other regions can aspire to.

The Connected Communities presentation by Cindy Berwick and Michele Hall was a stand out because the program had strong elements in it that made sense. Bring community and new teachers together. I also liked the way the presentation was linked to keywords that are so memorable: DESIRE, COURAGE and EFFORT. Also, the way the leaders of the project met with key stakeholders to ensure success. So much to learn from this initiative.

Gail Clark (community), a genuine interest in making mathematics relevant for children in her context.

Community presentation by Harry Miller and Rebecca Richards

The BHP Billiton CSIRO project, which had the most potential to assist in Aboriginal and Torres Strait Islander education.

Michele Hall and Cindy Berwick presentation was strong and was indicative of community driving change

Marion Heard BHP project Confident speaker, inspiring potential successful story happening.

It’s wonderful to see so much excellent work already being undertaken.

Community
- Tough call. Either Robyn Jorgensen (well-researched examples of good practice) and Steve Thornton (practical detail of fly-in fly-out training for Indigenous teacher aides), or Caty Morris (report of wide-ranging Make it Count program) and Tracey Armstrong (detail of whole-school program and strategies in a WA primary school)
- Immanuel College high expectations, relationships, rigour and recognition etc RATEP presentation re teaching mathematics and the examples from Taoundi College was excellent as well

3. Overall, the Distillation of Practice sessions held after each of the Presentation sessions worked well?
   a. 7 Strongly Agreed
   b. 23 Strongly Agreed
   c. 10 were Unsure.

4. The Business Panel and the following Q & A session were an important and useful part of the conference?
   a. 8 Strongly Agreed
   b. 16 Agreed
   c. 10 were Unsure
   d. 3 Disagreed

5. The Theme Group discussions and the Theme presentations at the end of Day 2 were effective?
   a. 6 Strongly Agreed
   b. 18 Agreed
   c. 9 were Unsure
   d. 1 Disagreed

6. The conference overall was a success?
   a. 17 Strongly Agreed
   b. 20 Agreed
   c. 3 were Unsure

7. The conference process worked well?
   a. 8 Strongly Agreed
   b. 26 Agreed
   c. 6 were Unsure

8. What do you hope will be the outcomes of the conference (eg at Community, Tertiary and Business levels, for ATSIMA etc)?
   - Continued links between education tertiary and business
   - Business will take the lead in coordinating long term political activity to achieve proper educational outcomes for Indigenous students
   - More information and development in rural communities and respect it as you
I hope we can forge a partnership with the business providers to capacity build the knowledge of Aboriginal parents in support of the program we deliver.

Continued conversations between education, community and business with a drive to focus on supporting students to engage with mathematics and other STEM areas early in their educational journey, allowing for greater participation and take-up of opportunities that are provided to community by the business sector - essentially closing the gap.

Our community needs to be more pro-active in getting our Indigenous kids to school.

Learn some new perspectives on Indigenous student education and how to promote success in Indigenous students.

Greater clarity on the opportunity to influence STEM related engagement and advancement in Aboriginal and Torres Strait Islander education.

Workforce development (teacher) thru strategic and effective pre-service and in-service

I hope there can be continued discussions in this very important area

A task group will be established to make sense of all the feedback and discussion so that an action plan can be developed. Action needs to come out of these two days.

Would like to see the overall success from 2012 - 2014 theme discussions. Looking at the theme discussions from 2012 not much change has occurred.

I hope we can forge a partnership with the business providers to capacity build the knowledge of Aboriginal parents in support of the program we deliver.

Ongoing connection and progression of this work. How can I stay connected? Through the web site and the twitter feed?

A greater understanding and need for encouragement into STEM subjects for Indigenous students.

Stronger localised partnership approaches involving community, education and business - improving outcomes for Aboriginal kids through school to work or further learning/training beyond work. Also stronger STEM focus for Aboriginal students from a young age.

More networking

Improved confidence in numeracy skills of all students

Building networks. Exchanging information on common issues and successful programs

I hope that the recommendations put forward will happen soon and people involved in the conference will be a part of some of those developments.

To have an even more holistic approach, where early years educators can see the links towards employment, etc, and for tertiary educators to appreciate what needs to happen and does happen in early years.

Continued conversations between education, community and business with a drive to focus on supporting students to engage with mathematics and other STEM areas early in their educational journey, allowing for greater participation and take-up of opportunities that are provided to community by the business sector - essentially closing the gap.

Our community needs to be more pro-active in getting our Indigenous kids to school.

Learn some new perspectives on Indigenous student education and how to promote success in Indigenous students.

Greater clarity on the opportunity to influence STEM related engagement and advancement in Aboriginal and Torres Strait Islander education.

...stronger STEM focus for Aboriginal students from a young age.

Continued conversations between education, community and business with a drive to focus on supporting students to engage with mathematics and other STEM areas early in their educational journey, allowing for greater participation and
- more Aboriginal students finishing school and going to higher education
- more focus on working towards better teaching and learning in mathematics and success for the Indigenous students
- More networking, more liaison with each other. More sharing of success stories.
- Focus groups, future conference, advise government, be the go to group
- I hope there will be a small group who can follow up and create an action plan.
- A national working group between educators, business and community.
- Increased understanding by all - information to be disseminated across all communities.
- 1. Encouraging Aboriginal and Torres Strait Islander to embrace and be proud of their own culture. 2. Introduce more Aboriginal and Torres Strait Islander mathematics into the mainstream curriculum but respect it as you would the mathematics from other cultures.
- More encouragement for Indigenous learners to persevere to finish their education, i.e. Ways to support them in their chosen endeavours.
- Strong Recommendations from session feedback on the way forward. Use this as a benchmark for the next conference.
- Collaboration with groups (e.g. QUT) that have existing successful programs.
- More effective and coordinated work to improve outcomes in STEM.

9. **How will you use your experiences from the conference?**

- Continue to promote STEM pathways for Aboriginal students and also support high quality mathematics teaching for Aboriginal students.
- To advise parents, students and administrators as opportunities arise.
- To continue working in the schools and with my community to advocate and marketing up skilling student in maths
- To network with tertiary, business presenters
- I hope to do some follow up research into maths teaching in schools that retain high numbers of students in all maths subjects to the end of yr 12
- Have already spoken to key personnel at my school. Would also like to have an opportunity to be further involved, perhaps on a State or National level.
- I am aware of the many opportunities for our Aboriginal and Torres Strait Islander students, and have shared some of these at
a staff meeting on my return. I’m aware of the “middle of the class” and ideas for encouraging these students to think about STEM subjects.

- Feedback to organisation
- Applied in current practice
- Promote and share. The Westpac 100 day plan is something I will use as a process.
- Further encouragement for our students
- To inform my approach to consultation and program planning and evaluation.
- promote more explicit numeracy training
- In-service my staff re issue relevant to teaching numeracy
- to consider and encourage others to consider the flow on from what we do with kids to what is possible for them down the track-life options
- Notes and general information has already been circulated to colleagues, with a focus on Aboriginal and Torres Strait Islander student engagement within STEM becoming an increasing area of improvement.
- Be more strategic in tracking learning outcomes for our Indigenous students.
- Possibly could add some angles to future inclusive methods of outreach program design.
- Attempt to develop partnerships in the mid to longer term for the development of projects.
- to ensure better education of Aboriginal students
- make more connections and forging ways forward
- I talk to everyone I can about Indigenous maths education and that it is something to celebrate and see it continue to grow.
- In my teaching, discussions with colleagues and parents
- To be honest I am not sure.
- Implement strategies learned.
- I will keep an eye out for gifted Aboriginal and Torres Strait Islander students who may be suitable candidates for the BHP Billiton CSIRO project.
- As AET at a high school I can facilitate certain understandings for staff and support students. We must all work together for a common goal.
- Incorporate a greater range of cultural diversity into my maths and science teaching.
- To write and research further.
- I will draw on the people I met to enrich the related activities I do at work.
- gathering of ideas and influencing change, building networks etc.
10. What are your recommendations or suggestions for any future conferences ATSIMA might have?

- Extend to three days (or even four) and have some days devoted to such matters as teacher pre-service, primary school teaching, community involvement and working with parents to mention a few.
- Have more community people attend.
- Workforce development strategies that have been successful based on student outcomes.
- I would be interested in hearing from more teachers/researchers about methods that work in schools with large aboriginal populations.
- Change the overall theme discussions on Day 2 and give some advice on the successes of what has been generated from the discussions.
- I really enjoyed my time but I'm not sure if you can keep the whole conference relevant for everyone when they come from some very different contexts. I'm not sure if there is a solution for this.
- Given some of the feedback and questions from teachers on the 'floor' of the conference, more work needs to be done in promoting cultural knowledge and understanding. There were still those that were looking for a quick fix. Learning about culture is different from having an ethos or deep understanding for how to apply thinking. Perhaps someone who could support how to think differently would be a useful speaker.
- It was your first so congratulations and thankyou. It was a useful experience.
- How can the primary school sector help?
- Opportunity to share resources, web sites, programs
- Focus group pertaining to various sectors in education assisting the numeracy needs of students.
- Set up an ongoing chat space or some further phone link up, etc so that links made at the conference are then continued.
- none
- Maintain the same/similar format to this year.
- Lock in speakers, if possible. What happens in schools where there may only be one Indigenous student?
- Perhaps use only 2 parallel sessions, so people can attend more talks. The trade-off is that it may be necessary to reduce the time allowed for each talk.
- none this was a great conference
- Have a bigger focus on teaching and learning.
- Keep an eye on male/female balance among presenters overall.
- Great work!
- Please do not have another largish conference. Have smaller ones focused on key aspects with a real action focus.
- More proven pedagogical practices shared.
- Less talk and more hands-on activities.
- Probably need to get together again and make use of the collated information from this conference, what to do next.
- Rotate location around the states and territories
- Day 1 should have been over two days. The business panel could have been shorter. A more structured approach to the final discussions.
- Perhaps to strengthen each stream. Maybe build on the tertiary sector? I think most were from secondary schools. Thanks Chris and Caty!
- Continue the mixture of plenty of content, bigger picture, and participatory nature of conference.
- That there are some real teacher examples that are shared by classroom teachers and more examples of higher education and businesses giving examples.