Mathematics and Indigenous learners: Why community, business, and education together must make a difference

By Chris Matthews, Bill Lawson and Caty Morris
The Aboriginal and Torres Strait Islander Alliance is a growing collaboration between education, business and community sectors to make a difference to the education outcomes for Indigenous learners in mathematics. The Alliance grew out of the ‘Closing the Gap’ project Make it count: Numeracy, mathematics and Indigenous learners managed by the Australian Association of Mathematics Teachers Inc (AAMT) and a Blueprint released by the Association in 2013. We are working towards a new story of what maths is, and how it can be taught.

Background
Maths outcomes in Australia’s schools for Indigenous students’ continue to remain substantially behind those of their non-Indigenous counterparts (Thomas et al 2013). Maths remains an impenetrable gatekeeper (or gate opener depending on which side of the tracks you’re from) for university or TAFE acceptance and success, in courses, and apprenticeships.

Society views that anyone good at maths is intellectually superior and those good at maths ‘tend to be White males or Asian’ (Waddell 2014, p. 2). Maths holds a privileged status in schools, society and the business world as an elite pursuit for the smartest of people. This supports the view that maths is out of reach for the rest of us and inaccessible, and thus has many social and cultural implications.
The 220-year-old process of colonisation, westernisation and capitalism has had huge impact on Indigenous people and culture. In many ways it continues to deny Indigenous students’ access to study and career opportunities that can help to counter this impact in positive and productive ways.

Maths is viewed as culture free. We know that maths is embedded in Indigenous cultures (and in all cultures) and yet this is not reflected in classrooms, in training, and in schools and organisations. But, as long as Aboriginal and Torres Strait Islander students are not literate in mathematics they will be ‘doomed to second-class economic status’ (Moses and Cobb, 2001). Students are not failing because they are Aboriginal; we must look beyond this misconception and consider how maths is taught at home and in the classrooms and how Aboriginal students can be given access to high levels of ‘ambitious’ (Waddell 2013) mathematics.

We want Indigenous students to be empowered and gates opened to them so they are better positioned to make a difference to their communities, the organisations and systems in which they work, and their worlds.

ATSIMA needs an Alliance of people from different sectors who together want to make a difference.

ATSIMA’s beliefs

ATSIMA is a collective effort on the part of community, education, and business established by the AAMT. We believe that all Indigenous students are capable of achieving ambitious mathematics learning if they are given the appropriate support, challenge, and learning experiences.

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 three 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).

ATIMSA is creating new spaces for community, education and business to come together and collaborate to improve outcomes for Indigenous learners and support the growth of more prosperous futures for Indigenous students and their families.
ATSIMA’s goals

ATSIMA's goals include to:

- Work towards the equitable distribution of opportunities to learn mathematics
- Work towards maths as a cultural activity, maths learning as a cultural enterprise, and maths education as a cultural and political activity
- Understand and navigate the pipelines and pathways that lead to academic success for Indigenous students
- Work with business to develop and implement Reconciliation Action Plans and other initiatives that target improved employment and training opportunities for Aboriginal and Torres Strait Islander students through mathematics.

Mathematics is a civil rights issue (p. 216 Nasir et al 2008). Like any Australian, Indigenous students have a right to a good education. Business has played a role in the status quo and must be involved in the empowerment process for the future.

Fortunately, business has begun to see - and understand - the role it can play and is increasingly attempting to turn around the situation through various approaches reflected in, for example, Reconciliation Action Plans. Other initiatives include the Generation One whose mission is to end the employment strategy between Indigenous and non-Indigenous Australians. Business is also understanding how Indigenous knowledges and cultures have much to offer and can be of great benefit to them and their employees.

Why is ‘Business’ interested in getting more involved?

‘Business’, meaning prospective employers from both public and private sector, is now getting more interested in helping overcome Indigenous disadvantage across health, housing and education.

Why?

Perhaps it is a reflection of action following the Apology by Kevin Rudd and/or it may be an outcome out of so many corporates, departments and organisations (small and large such as AFL and NRL clubs) preparing, registering and actioning Reconciliation Action Plans. All RAP’s must include the creation of real opportunities to ‘close the gap’ and it is a logical step to realising the validity of creating educational and training as well as employment opportunities for young Indigenous Australians.
Many of these organisations have technology as their core business which very frequently leads to maths as a prerequisite for prospective university or TAFE candidates. Maths is a cumulative learning process – arithmetic before algebra before trigonometry etc – and, unlike many other fields of learning, is not easily retrieved once quit in early education. Added to this is the difficulty encountered by a child attempting maths if there is no mathematical interest at home.

‘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. It is now timely for AAMT and ATSIMA to bring the importance of maths education more into view.

Conclusion
There is a strong, tangible desire by communities, educators and employers to make a difference. From community we hear, ‘Aboriginal people have lost so much. It’s time we moved to a new covenant’ (p. 17, Yunupingu in the Weekend Australian, 2014). From educators we know that ‘Many Indigenous students are not reaching their potential in mathematics at schools and subsequently in life beyond school. This must be changed’ (p. 2, AAMT 2013). From business we hear that ‘Seismic, not incremental, change is required and the time for action is now. These solutions are not expensive and parity is completely achievable with the strength of will from each of us (p. 1, Forrest 2014).

Working strategically, collaboratively and creatively is a must, and together we – communities, educators and business – must find new ways so all Aboriginal and Torres Strait Islander students are successful in mathematics.

We invite you to find out more about ATSIMA and become involved:
Go to our website: http://atsimanational.ning.com
Come to our conference: http://bit.ly/1nVXbNf
Download our Prospectus: http://bit.ly/1mqgx0P

References
AAMT 2013, Make it count Blueprint: Supporting best teaching of mathematics for Indigenous learners.
Thomas S, De Bortoli L, Buckley S 2013, PISA 2012: How Australia measures up, ACER.
About the authors

**Dr Chris Matthews** is a Minjerribah traditional owner in the Quandamooka Nation (Moreton Bay, Queensland). He obtained a Bachelor of Science (Honours) from Griffith University and was awarded the Doctor of Philosophy from the same university in 2003. Chris is currently on leave from his position as lecturer in Griffith School of Environment at Griffith University. He is a member of the Indigenous Environments Network, a community-based organisation dedicated to increasing the participation of Indigenous peoples in architecture, engineering, science, mathematics and technology.

Chris’s areas of expertise are Soil physics and infiltration problems, Mathematics Education, and Social and Cultural constructions of Mathematics and Science. Chris was the Patron of the AAMT Make it Count project conducted nationwide between 2009-2013.

**Bill Lawson** AM founded the Beacon Foundation in 1988 and remains the Chairman with a passion for helping all young Australians to discover, understand and realise their potential and the opportunities in front of them, particularly disadvantaged young people.

Bill is a retired Engineer having worked in both the public sector (15 years) and private sector (28 years), during which time he was responsible for many large and diverse projects both in Tasmania and throughout Australia. In 2003, Engineers Australia recognised Bill as the National Professional Engineer of the Year. In 2006, Bill was made a Member of the Order of Australia for ‘Services to Engineering and Young People’.

Since 2000, Bill has become increasingly involved in Indigenous issues with a specific focus on helping Aboriginal and Torres Strait Islander communities, especially young people, overcome their many disadvantages. In 2011, Bill was appointed to the Prime Minister’s Expert Panel for the constitutional recognition of Indigenous Australians.

**Caty Morris** is Manager, Primary Mathematics and Science for the Department of Education and Child Development SA. Up until recently she was National Manager Indigenous Programs for the Australian Association of Mathematics Teachers (AAMT). In this capacity Caty managed the Australian Government’s ‘Closing the Gap’ project Make it count: Numeracy, mathematics and Indigenous learners 2009-2013. Caty began her career as a primary school teacher in the Adnyamathanha community of Nepabunna in the northern Flinders Ranges teaching from CPC-Year 8 and later principal. Since then, Caty has had a range of teaching and leadership positions in NSW and SA and in the Bronx district in New York as a summer school math consultant.