



## **EXCELLENCE & EQUITY IN MATHEMATICS**

Aboriginal & Torres Strait Islander Student Achievement  
and Tertiary Aspirations in Mathematics & STEM

# **PROJECT IMPLEMENTATION PLAN**

2015–17

May 2015



University of  
South Australia



**aamt**  
THE AUSTRALIAN  
ASSOCIATION  
OF MATHEMATICS  
TEACHERS INC.

## Document control

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## Related documents

AMSPP *Conditions of Grant* funding agreement between the Australian Government Department of Education and the University of South Australia, November 2014

*Excellence and Equity in Maths [xe]* project proposal to AMSPP, July 2013

*[xe]* *Stakeholder Communication Strategy Plan*, Draft, March 2015

*[xe]* *Risk Management Plan*, March 2015

*[xe]* *Literature Review*, Draft, July 2015

*[xe]* *Project Schedule 2015–17* (Microsoft Project Plan/Gantt chart)

UniSA Human Research Ethics Application ID 0000034018

First *Progress Report* to AMSPP, March 2015

*Excellence and Equity in Maths [xe]* project blog, UniSA [ [www.xe.edu.au](http://www.xe.edu.au) ]

Comments or feedback on this Project Plan can be directed to [stem@xe.edu.au](mailto:stem@xe.edu.au).

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### Project Sponsor

The *Excellence & Equity in Maths [xe]* project is funded by the Australian Government Department of Education through the Australian Maths and Science Partnerships Program.

# Contents

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- 1 Executive Summary 4**
- 2 Introduction 5**
  - 2.1 Purpose ..... 5
  - 2.2 The AMSPP initiative ..... 5
  - 2.3 Background..... 5
  - 2.4 Project assumptions ..... 7
- 3 Project Scope 8**
  - 3.1 Project outcomes ..... 8
  - 3.2 Scope exclusions ..... 9
- 4 Project Deliverables 9**
  - 4.1 National audit and review ..... 9
  - 4.2 Pilot projects and case studies ..... 10
  - 4.3 Stakeholder consultation ..... 11
  - 4.4 Mathematics portal ..... 13
  - 4.5 Presentation and dissemination..... 14
  - 4.6 Project evaluation ..... 15
  - 4.7 AMSPP engagement ..... 16
- 5 Project Management 17**
  - 5.1 Governance ..... 17
  - 5.2 Project implementation ..... 17
  - 5.3 Risk management..... 18
  - 5.4 Reporting ..... 18
- 6 Budget 19**
  - 6.1 Project expenditure..... 19
  - 6.2 Grant payments ..... 19
- 7 Appendices 20**
  - 7.1 Project governance..... 20
  - 7.2 Project team..... 20
  - 7.3 AMSPP/AAMT projects..... 21
  - 7.4 Contract reports and KPIs ..... 21
  - 7.5 Project schedule ..... 22

# 1 Executive Summary

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The *Excellence and Equity in Maths [xe]* project is a national initiative that aims to foster mathematics excellence and equity in schooling and tertiary education participation for Aboriginal and Torres Strait Islander students, to:

- improve Indigenous school student participation and achievement in mathematics and numeracy education; and
- increase the number of Indigenous young people with the aspirations and capability to undertake tertiary study in Science, Technology, Engineering and Mathematics (STEM) disciplines.

The *Excellence and Equity in Maths [xe]* project is funded by the Australian Department of Education, and led by the Dean, Indigenous Scholarship, Engagement and Research, University of South Australia, in partnership with the Australian Association of Mathematics Teachers.

Contract outcomes for the [xe] project include seven interrelated strategies:

- a) a national audit and review of current professional practices, mathematical teaching resources and university outreach programs in science and mathematics;*
- b) design and implementation of a series of school learning and teaching pilot projects, and university case studies;*
- c) consultation with students, educators, mathematics curriculum experts, and other stakeholders in the design, delivery and evaluation of the project;*
- d) publication of project findings and resources to a national mathematics web portal;*
- e) presentation of project findings and resources to a range of forums for Indigenous students, and professional learning events for teachers and academics;*
- f) data collection to measure the success of the project against AMSPP program objectives and [xe] project objectives, and*
- g) engagement with the Office of the Chief Scientist and other projects supported under AMSPP.*

Currently, Aboriginal and Torres Strait Islander people are significantly under-represented in the higher education system, contributing to high levels of social and economic disadvantage.

Under-representation in mathematics and STEM study is particularly acute for Indigenous people. In the period 2011–2013, 8.4% of Indigenous enrolments were in STEM-related disciplines compared with 22.9% for all enrolments in these disciplines.

The [xe] project will identify a national suite of quality mathematics learning and teaching resources and professional practices, and a communications strategy to increase the engagement of Indigenous students in maths and STEM study. The project team will also publish evidence and case studies to inform future programs and policy by schools, universities and Indigenous community advocates.

The most significant school and university project activity will occur in the 2015 and 2016 calendar years, with contractual and reporting obligations concluding in May 2017.

A transition plan that outlines the future recommendations and sustainability of the initiative will be developed in 2016–17.

The budget for the [xe] project is \$783,000, supported by a further \$520,000 of in-kind contributions.

## 2 Introduction

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### 2.1 Purpose

This *Project Implementation Plan* outlines the scope, deliverables, strategies, governance, project management, evaluation process and budget for the *Excellence and Equity in Maths [xe]* project.

The project aims to influence reforms that better support the learning and study trajectory of Indigenous students from secondary schooling to undergraduate studies in higher education.

The project will identify effective pedagogies and practices in schools and universities in order to inform, influence and redress the current educational inequity evident in both sectors.

Reforms in mathematics learning for Indigenous students in schools will be followed by an examination of the key factors and program responses that lead to greater student aspirations towards, and increased enrolment in, higher education.

The higher education component of the project will focus more broadly on studies in science, technology, engineering and mathematics (STEM) – disciplines that require significant mathematical knowledge and skills.

The *[xe] Project Implementation Plan* and associated risk management, communication and sustainability plans are a requirement of funding provided by the Australian Government Department of Education *Australian Maths and Science Partnerships (AMSPP)* program.

The *Excellence and Equity in Maths [xe]* project is led by the office of the Dean, Indigenous Scholarship, Engagement and Research, University of South Australia, in partnership with the Australian Association of Mathematics Teachers.

The *[xe] Project Implementation Plan* is a working document that will be progressively reviewed and updated during the course of the initiative.

### 2.2 The AMSPP initiative

The Australian Maths and Science Partnership Program<sup>1</sup> (AMSPP) is aimed at improving outcomes in the learning and teaching of maths and science.

The purpose of the AMSPP is to improve student engagement in maths and science courses at university and schools through innovative partnerships between universities, schools and other relevant organisations.

### 2.3 Background

Science, technology, engineering and mathematics (STEM) are of significant importance in education and the economy. Capability in STEM is now seen as key to productivity, technological adaptation and research-based innovation. However, there is little research about STEM participation, programs and educational practices from an equity and diversity perspective.

To date, Aboriginal and Torres Strait Islander student participation and attainment in mathematics and STEM studies is unexamined, despite significant under-representation by Indigenous people in study and the labour force.

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<sup>1</sup> <https://education.gov.au/australian-maths-and-science-partnerships-program>

## Indigenous student achievement in schooling

In 2014 there were a total of 192,485 Aboriginal and Torres Strait Islander students, representing 5.2% of the total Australian school student population – including 71,065 Indigenous secondary students who are the focus of the schooling component of the project. Eighty-five per cent of these students live in major cities and regional towns.

Between 2008 and 2014, the proportion of Aboriginal and Torres Strait Islander students at or above the national minimum standards in numeracy has shown no significant improvement nationally in any of the measures (years 3, 5, 7 and 9 in numeracy).<sup>2</sup>

Progress in the *Closing the Gap* target for Year 12 attainment is more encouraging. Nationally, the proportion of Indigenous 20–24-year-olds who achieved Year 12 or equivalent increased from 45.4% in 2008 to 58.5% in 2012–13. The gap between Indigenous and non-Indigenous students narrowed by 11.6 percentage points in the same period.

Limited data or research is available on the factors and pedagogies that improve Indigenous student engagement and success in mathematics in secondary schooling.

The intersection of gender and Aboriginality on study success is also poorly understood and will be investigated as part of the project research.

## Indigenous student participation in higher education

Aboriginal and Torres Strait Islander people are significantly under-represented in higher education studies and this contributes to high levels of social and economic disadvantage.

Under-representation in the STEM disciplines is particularly acute.

Aboriginal and Torres Strait Islander student patterns of participation in STEM disciplines are subject to many interrelated factors, namely:

- total participation of all students in STEM is low, and declining rapidly;
- participation of Indigenous people in STEM is considerably lower compared to all higher education enrolments – in 2011–2013 8.4% of Indigenous enrolments were in STEM-related disciplines compared with 22.9% for non-Indigenous enrolments;
- contrary to the trend for all students, there appears to be modest growth in Indigenous enrolments in STEM – i.e. there has been some progress in closing a very wide gap.

The following chart demonstrates Indigenous participation rates in STEM-related fields of study across all Australian universities. The chart compares this participation data with other fields of study and to the 2.2% parity benchmark for Aboriginal and Torres Strait Islander higher education students recommended in the *2012 Behrendt Review*.<sup>3</sup>

Knowledge and skills in mathematics is widely recognised as a gateway subject to achieve success in the STEM areas of study.

It should also be noted that although sciences, technology and engineering are highlighted, mathematical and STEM capability are required in a broader range of disciplines such as commerce and health.

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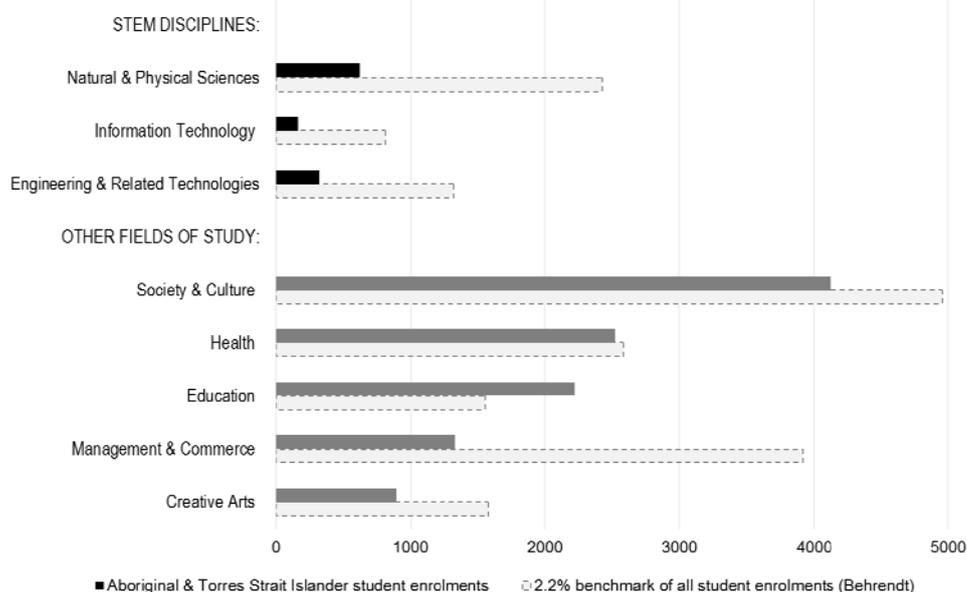
<sup>2</sup> Australian Government, *Closing the Gap Prime Minister's Report 2015*

<http://www.dpmc.gov.au/pmc-indigenous-affairs/publication/closing-gap-prime-ministers-report-2015>

<sup>3</sup> Professor Larissa Behrendt (Chair), 2012 *The Review of Higher Education Access and Outcomes for Aboriginal and Torres Strait Islander People* Australian Government

<http://docs.education.gov.au/documents/review-higher-education-access-and-outcomes-aboriginal-and-torres-strait-islander-people-0>

## Average total enrolment of Indigenous higher education students by field of study (2011–13)



## 2.4 Project assumptions

The *Excellence and Equity in Maths [xe]* project is based upon the following assumptions:

- The project will identify effective pedagogy and educational practices in schools and universities in order to inform, influence and redress the current educational inequity for Indigenous students evident in both sectors.
- Research indicates that effective teaching strategies for Indigenous students are likely to benefit all students.
- The primary audiences for the project are educators and policymakers in schools and universities. However, the project will also directly engage with Aboriginal and Torres Strait Islander students to provide a ‘reality check’ on project assumptions and approaches.
- Widely divergent opinions and potential mismatches exist about the place, relevance and intersections between STEM and Indigenous cultures and world views.
- Increasing the visibility and sharing of effective learning and teaching approaches to mathematics and STEM will lead to better policy and practice and achievement of Indigenous people in STEM-related study and careers. An effective communications strategy will be crucial to effect lasting change across the education sectors.
- Primary responsibility for teaching and learning science, technology, engineering and mathematics rests with maths/STEM educators, supported by Aboriginal and Torres Strait Islander staff, specialist units and community.
- Most future jobs and economic growth will require STEM skills and knowledge. The current gap in educational outcomes in STEM limits career opportunities and economic development for Aboriginal and Torres Strait Islander Australians.

The validity of these assumptions will be reviewed in the consultative phase of the project in early 2015, with project responses adjusted where necessary.

## 3 Project Scope

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The *Excellence and Equity in Maths [xe]* project addresses two areas of educational inequity:

- significant gaps in achievement in numeracy and mathematics outcomes between Indigenous students and the total student population in Australian schools; and
- under-representation of Indigenous people participating in higher education, particularly acute in mathematics and STEM-related disciplines.

The project will deliver a series of strategies and outputs to improve teacher capability in mathematics pedagogy, and demonstrate how these skills and knowledge can most benefit Aboriginal and Torres Strait Islander students.

In addition to supporting classroom practice in mathematics, the project will examine strategies that build upon Indigenous student attainment at school into successful tertiary pathways.

The project commenced in November 2014 with contractual and reporting obligations scheduled to conclude in June 2017. Most of the school and university project activity will occur in the 2015 and 2016 calendar years.

### 3.1 Project outcomes

Contract outcomes for the [xe] project include seven interrelated strategies:

- a) a national audit and review of current professional practices, mathematical teaching resources and university outreach programs in science and mathematics;*
- b) collaboration between the University of South Australia (UniSA) and the Australian Association of Mathematics Teachers (AAMT) to design a series of school learning and teaching pilot projects and university case studies;*
- c) consultation with students, educators, academic staff, mathematics curriculum experts, Indigenous teachers and other stakeholders in the design, delivery and evaluation of the project;*
- d) publication to a national web portal of project findings and effective digital learning resources with an Indigenous focus;*
- e) presentation of project findings and resources to a range of forums including Indigenous student events and professional learning events for teachers and academic conferences;*
- f) data collection to measure the success of the project against AMSPP program objectives and [xe] project objectives; and*
- g) engagement with the Office of the Chief Scientist and other projects supported under AMSPP.*

A series of school cluster pilot projects and university case studies will be conducted in 2015 and 2016.

AAMT will facilitate pilot projects designed to support best mathematics pedagogical knowledge and practice with teachers in schools. UniSA will manage higher education case studies and pilot studies that effectively encourage Indigenous students to consider and successfully participate in tertiary study in mathematics and STEM degrees.

A project research and evaluation strategy in 2015 and 2016 will establish an evidence base to help ensure current and future investments in addressing inequities are directed to areas of maximum impact and benefit.

## 3.2 Scope exclusions

The following program aspects are out of scope for the [xe] project:

- reforms or responses designed to address social determinants and historical factors that affect Aboriginal and Torres Strait Islander people, whilst recognising their impact;
- pilot projects in primary schools;
- significant design and production of new learning and teaching materials; and
- management of the *Aboriginal Summer School for Excellence in Technology and Science* (ASSETS) student program – the project team will negotiate with the agencies leading the ASSETS summer school to leverage student activities for mutual benefit.

# 4 Project Deliverables

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The following deliverables specified under the AMSPP agreement include the outcomes, activities and key performance indicators (KPIs) for the [xe] project.

## 4.1 National audit and review

*(a) A national audit and review of current professional practices, mathematical teaching resources and university outreach programs in science and mathematics*

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The project will build upon the most current qualitative and quantitative research available as the basis for developing and maintaining effective and lasting strategies to overcome inequities in mathematics and STEM education outcomes for Indigenous students.

An initial environmental scan will identify existing initiatives, practices and resources that encourage and support Indigenous student participation in science and mathematics. The scan will focus on effective and/or promising classroom practices in the schooling sector, post-school pathways into university study, and equity reforms within STEM disciplines in higher education.

The project will also investigate theoretical underpinnings and research literature relating to Aboriginal and Torres Strait Islander student participation and success in science and mathematics. Longitudinal student data on student participation in school and university study will be collected through a range of sources (refer section 4.6).

The audit and review will enable a deeper understanding of the current professional context, increase the visibility of existing effective practices, inform selection of project sites and resources, and enable more targeted consultation.

The review, to be completed in the first half of 2015, will capture findings through a digital project repository and report on findings through a range of channels outlined in section 4.5.

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### KPIs: National audit and review

- *Report on findings of literature review and environmental scan*
-

## 4.2 Pilot projects and case studies

*(b) Collaboration between the University of South Australia and the Australian Association of Mathematics Teachers to design a series of school learning and teaching pilot projects and university case studies*

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The largest component of the [xe] project is two complementary series of school and university pilot projects and case studies, conducted respectively by AAMT and UniSA in 2015 and 2016.

The pilot projects and case studies will engage networks of staff and students, including teachers and lecturers in mathematics and science, university maths/STEM faculties and Indigenous higher education centres, and Aboriginal and Torres Strait Islander students and educators.

Pilot projects and case studies will be drawn from and shaped by these networks, and will be informed by the initial project audit and review in the previous section.

The selection criteria of project sites will include the following:

- quality and rigour of mathematics teaching, and influence on tertiary aspirations, as evidenced by professional activity, and Indigenous student outcomes;
- the ability of schools and universities to influence their peers and professional practice within and beyond their institution;
- schools and universities with significant numbers of Aboriginal and Torres Strait Islander students, successful outcomes, and with demonstrated commitment and strategies to attracting and supporting Indigenous students into successful studies in STEM;
- diversity of school and university contexts, education profiles and locations (e.g. government & non-government, city and regional, mode of delivery);
- the activities and outcomes from identified institutions that are replicable in other locations with similar resourcing and staffing constraints;
- the extent to which pilot cluster projects and case studies are cost-effective to initiate and maintain.

### School cluster pilot projects

A series of strategies are planned to improve teacher capability in mathematics pedagogy and demonstrate how these skills and knowledge can most benefit Aboriginal and Torres Strait Islander students.

Two series of school cluster pilot projects are planned, one in 2015 and the second in 2016. Each will involve five clusters of up to four schools with secondary cohorts – students in years 7–10 will be the principal target group. The pilot projects will build on the approaches and findings from AAMT's successful *Make it Count*<sup>4</sup> project.

Initial school cluster sites in 2015 include northern Adelaide, NSW central coast, northern Melbourne and central Australia.

The pilot learning projects within school clusters will be supported by the AAMT Manager, Indigenous Projects, working with academic critical friends and other experts in mathematics and Indigenous education.

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<sup>4</sup> <http://mic.aamt.edu.au>

## University case studies

In addition to supporting classroom practice in mathematics the project will closely examine strategies that build on Indigenous student attainment at school and into successful tertiary study pathways in STEM disciplines that are underpinned by mathematics.

Two series of case studies of successful university practices and interventions will be conducted in 2015 and 2016. At least five examples of effective practice will be selected each year on the basis of interviews and surveys of Australian universities and consultation with STEM and Indigenous higher education staff.

Documentation of performance indicators and evaluations of these programs from universities and schools will be obtained. It is anticipated that interviews and documentation will provide information about:

- aims and activities of programs;
- dimensions of the program (numbers of students, target group, duration, timing);
- demographics (age range, gender);
- previous evaluation/outcomes data;
- participant satisfaction and any changes in attitudes;
- evidence of changes to Indigenous student participation in STEM;
- feedback from schools and universities, parents and communities; and
- support from university (and any other supporting bodies).

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### KPIs: Pilot projects and case studies

- *5–6 quality schooling case studies developed each year*
  - *6 quality university outreach case studies developed each year*
  - *At least 200 Indigenous students participating in project activities*
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## 4.3 Stakeholder consultation

*(c) Consultation with students, educators, academic staff, mathematics curriculum experts, Indigenous teachers and other stakeholders in the design, delivery and evaluation of the project*

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The project is premised on effective partnerships with key stakeholders during the project design and implementation, and at the local level during the operations of project pilot and case studies and during student and staff events.

Consultation with stakeholders will take many forms including a formal governance group, focus groups, blog and online forums, participant surveys and discussion papers for comment.

Formal agreements will also be negotiated with school jurisdictions, school principals and university management for the conduct of pilot projects and case studies.

Consultation will be most intensive at the beginning of the project and with the achievement of key milestones.

The approach to project engagement is documented in the separate [xe] *Stakeholder Communications Strategy*.

## National networks

The partnership intends to leverage the respective national networks of both UniSA and AAMT, including:

- mathematics teachers and professional networks in all school jurisdictions, especially those with significant Indigenous student populations;
- Aboriginal and Torres Strait Islander teachers and school leaders, in conjunction with the UniSA MATSITI initiative;
- teachers, support staff and community advocates for Indigenous students;
- Indigenous higher education centres in 39 universities, with links to Deans of mathematics and science faculties, and university pathways and outreach programs;
- a range of education and community advocacy bodies such as school professional associations, STEM faculty networks, NATSIHEC, ACARA and IECBs (Indigenous education consultative bodies).

Industry engagement will be sought when the project implementation is under way later in 2015.

## Local partnerships

At the local level, all projects and events will be collaborative and based on joint commitment and co-investment by participating schools and universities.

Examples of local pilot partners include productive working relationships with clusters of school practitioners and leaders, Indigenous secondary students and teachers, mathematics specialists and academics, career advisers, Indigenous community leaders and university outreach staff.

## Students

The primary audiences for the project are educators (STEM and Indigenous education) and policymakers in schools and universities.

However, a range of forums and activities to engage directly with Indigenous students in a culturally respectful manner will ensure that teaching strategies and reforms address the study needs and aspirations of students and maintain cultural integrity in their approach.

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### KPIs: Stakeholder consultation

- *Numbers of students and teachers in project focus groups*
  - *Project reference group confirmed*
  - *30 Indigenous students attending Maths & Science Summer School<sup>5</sup>*
  - *100 Aboriginal and Torres Strait Islander teachers engaged with the project*
  - *Stakeholder Communication Plan developed*
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<sup>5</sup> The project team aims to engage with organisers of the ASSETS Summer Schools but is not responsible for management of the event or the number of attendees.

## 4.4 Mathematics portal

*(d) Publication of project findings and effective digital learning resources with an Indigenous focus to a national web portal*

The AAMT *Dimensions* portal aims to provide all Australian teachers and schools with access to the best in-service teacher training in key aspects of mathematics teaching.

The Dimensions portal will be a significant channel for communicating project findings and resources to school educators, mathematics specialists and Indigenous educators.

The vision for the Dimensions portal is a ‘one-stop shop’ for quality-assured, coherent and connected professional support and engagement in mathematics.

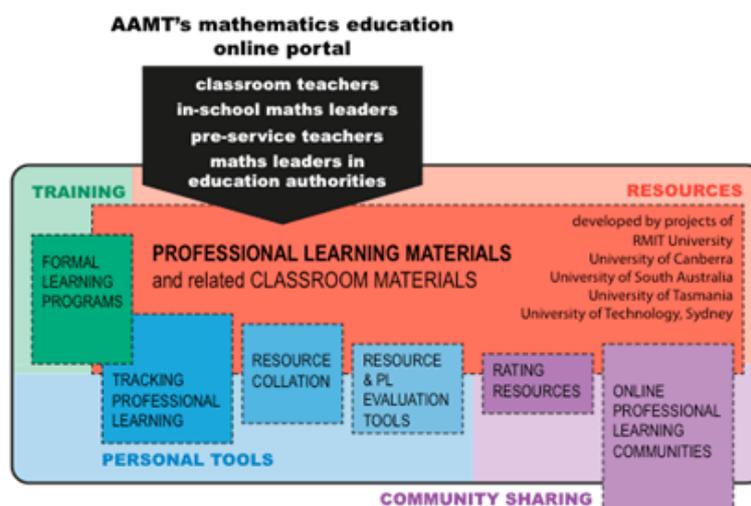
The AAMT portal will be a repository for mathematics resources from a range of partners, including other AMSPP projects. The [xe] project will contribute a cultural lens to mathematics learning resources and pedagogies.

The development and implementation of the portal is based upon the following principles:

- free and ready access for all teachers and schools;
- high quality professional learning resources and programs;
- the principal audience to be those with leadership responsibility in mathematics from the system to the school levels, and accessible for Indigenous educators and support staff; and
- the portal will be built, housed and operated by AAMT, with materials available under suitable licences from the owners of the relevant intellectual property.

The AAMT portal will be developed in four phases:

- **Phase 1** (2014–5) – Project initiation, including development of pre-beta version.
- **Phase 2** (Semester 2 2015) – Identification and evaluation of potential portal technologies developed in the design phases.
- **Phase 3** (2016) – Piloting and evaluation of the beta portal.
- **Phase 4** (2017) – Launch and promotion of the portal.



The portal is expected to have multiple entry points, including access to teaching resources and approaches appropriate for Indigenous students.

The design phase in 2015 will scope the portal navigation structure. Materials developed through the [xe] project will be reviewed and curated for inclusion in the shared portal during its implementation. Investigation of the publication of project higher education findings (where deemed out of scope for the portal) will be conducted in 2015.

All outputs of the [xe] project will be available on completion of the initiative through the AAMT portal and other channels for school and university staff and students. The portal will be a primary means to sustain the work, to be described in the transition plan of the project.

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### **KPIs: Mathematics portal**

- *Number of quality mathematics teaching and learning programs and resources published on the portal*
  - *Number of teachers and schools participating in the portal development*
  - *Number of visits to the AAMT portal*
  - *Evaluation report on success of pilot portal (including end-user satisfaction and increase in teachers' knowledge and skill)*
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## **4.5 Presentation and dissemination**

*(e) Presentation of project findings and resources to a range of forums including Indigenous student events, professional learning events for teachers and academic conferences*

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A comprehensive communications strategy is a crucial component of the [xe] project to achieve its aims to inform, influence and redress the current educational inequity evident in schooling and higher education.

Project communications will focus on professional development strategies for rigorous and culturally responsive mathematics teaching, increasing the effectiveness and use of quality STEM learning and teaching resources, and building on Indigenous student capacity and aspirations to enrol in maths and science study as a career of choice.

Project communications will include:

- targeted communications through monthly blog posts and email newsletter during the course of the project at [www.xe.edu.au](http://www.xe.edu.au);
- presentations at key school and university conferences, including AAMT national events and Indigenous education events;
- publications, including peer-reviewed journal articles on project findings;
- showcases of the findings from research, pilot programs and case studies;
- a final [xe] national project forum to disseminate findings and determine future recommendations;
- migration of professional learning and research assets to the AAMT Dimensions mathematics portal – to be available to educators beyond completion of the project.

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## KPIs: Presentation of findings

- 50 online participants attending virtual event
  - 6 conferences to showcase activities and results
  - 30 schools attending AAMT schooling showcases
  - 100 university staff and students taking part in higher education showcases
  - publication of 2 quality journal articles
  - surveys and measures of student and teacher satisfaction with final project event
  - a 'transition plan' that describes the future sustainability of the project
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## 4.6 Project evaluation

*(f) Data collection to measure the success of the project against AMSPP program objectives and [xe] project objectives*

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In negotiation with the AMSPP sponsor, UniSA will conduct a project evaluation with two components:

- review of effectiveness and impact of the [xe] project against project deliverables and KPIs; and
- indicators for schools and universities to measure future progress in improving outcomes for Indigenous students in mathematics and STEM.

The project will collect available data and evidence on Indigenous student participation and completion in STEM subject and disciplines in both secondary schooling and higher education.

Quantitative and qualitative indicators include, but are not restricted to the following:

- KPIs relating to the operations and outputs of the project – effectiveness of professional learning activities for teachers and university outreach strategies;
- NAPLAN results over time;
- Year 12 or equivalent subject selections, retention and completion rates;
- number of high-performing Indigenous students in Year 12 or equivalent;
- enrolment and completion rates in mathematics and STEM study in secondary schooling and university; and
- feedback on professional development, engagement strategies and portal usage and downloads (including web analytics and end-user satisfaction).

A key aspect of the evaluation will focus on the sustainability and transition arrangements following the conclusion of the project.

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### **KPIs: Data collection**

- *Project Human Research Ethics approval*
  - *Percentage of Indigenous students choosing maths and science in secondary school and university for each state and territory, and indicators of student performance*
  - *50 online participants attending virtual event*
- 

## **4.7 AMSP engagement**

### *(g) Engagement with the Office of the Chief Scientist and other projects supported under AMSPP*

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The [xe] project will work closely with the National Adviser from the Office of Chief Scientist, represented on the project reference group.

A network of five AMSPP project leaders (*MaPP – Maths Partnered Projects*) has been established to leverage respective AMSPP activities and resources, and jointly contribute to the development of the MaPP group.

The [xe] project team will collaborate with other AMSPP project owners directly and through forums initiated by the AMSPP sponsor.

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### **KPIs: AMSPP engagement**

- *Project Implementation Plan developed*
  - *Number of contacts with other AMSPP projects and teacher professional bodies*
-

# 5 Project Management

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The [xe] project team utilise a rigorous project management methodology<sup>6</sup> to ensure the quality and timeliness of management and delivery of the initiative.

## 5.1 Governance

A series of governance groups has been formed to provide strategic advice and management of the initiative.

### Project leadership group

The initiative will be led by the Project Director, Professor Peter Buckskin, in partnership with Mr Will Morony, CEO, AAMT.

The Project Director will report to the AMSPP Delegate, Australian Department of Education.

### Project reference group

An [xe] project reference group with expertise in Aboriginal and Torres Strait Islander education, mathematics pedagogy and curriculum in schools, and STEM disciplines in higher education and research will provide advice and strategic direction during the course of the initiative.

#### [xe] Reference group terms of reference:

- provide expert input and strategic advice to the [xe] project team;
- advise on the development, implementation and review of the project;
- identify further opportunities and contributions arising from the project;
- assist the engagement and communication with project stakeholders;
- participate in teleconferences, workshops, forums and focus groups, as appropriate.

A list of [xe] project reference group members is included in Appendix 7.1.

## 5.2 Project implementation

The [xe] project team will report to the Project Director. The project team will be responsible for the preparation, implementation and review of this project.

UniSA and AAMT leaders have clearly specified the respective project tasks and communications arrangements of the project as follows:

<b>Dean: ISER, University of SA</b> <i>(Lead Agency)</i>	<b>Association of Mathematics Teachers</b> <i>(Subcontracted Partner)</i>
<ul style="list-style-type: none"><li>• Overall project planning, governance and reporting responsibility to sponsor</li><li>• Review of student aspirations and university outreach programs</li></ul>	<ul style="list-style-type: none"><li>• Contribute to project planning, governance and reporting</li><li>• Review of maths resources and current pedagogies and programs</li></ul>

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<sup>6</sup> Project Management Body of Knowledge [www.pmi.org/pmbok-guide-and-standards/pmbok-guide.aspx](http://www.pmi.org/pmbok-guide-and-standards/pmbok-guide.aspx)

- 
- Management of case studies (tertiary aspirations & outreach programs)
  - Communications and events with Indigenous students, Indigenous teachers and university staff
  - Manage research, evaluation and transition strategy
  - Management of school pilot projects (teacher professional learning)
  - Communications and events with mathematics teachers, curriculum specialists and school leaders
  - Manage the Dimensions online maths portal

## 5.3 Risk management

The initiative includes a risk management strategy for strategic and operational components of the project. A risk register will be maintained throughout the initiative, prioritised by likelihood and impact, and reviewed and escalated when necessary.

Project risks identified at the commencement of the initiative have been assessed as moderate.

These risks include potential for limited engagement by and/or differing expectations of stakeholders, web portal design and implementation flaws, and problems associated with managing contracts and financials.

The [xe] *Risk Management Plan* outlines the approach to risk identification, monitoring, prioritisation, mitigation, responsibilities and policy framework.

In accordance with this plan, the project team manages a risk register.

## 5.4 Reporting

Project reporting obligations are specified in Schedule 1 of *Conditions of Grant* (CoG) with the Australian Government Department of Education.

### **Progress Report 1, due March 2015(accepted)**

- First progress report to the Commonwealth against key CoG project outcomes and milestones
- CFO-certified 2014 financial statement (UniSA and AAMT)

### **Progress Report 2, due March 2016**

- Second progress report to the Commonwealth against key CoG project outcomes and milestones
- CFO-certified 2015 financial statement (UniSA and AAMT)

### **Progress Report 3, due March 2017**

- Third progress report to the Commonwealth against key CoG project outcomes and milestones
- CFO-certified 2016 financial statement (UniSA and AAMT)

### **Final Report, due December 2017**

- Final report to the Commonwealth against project milestones, including an assessment of key CoG project outcomes and milestones, and a 'transition plan' that describes sustainability of the project.

## 6 Budget

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The budget for the [xe] project is **\$783,000** (ex GST) with an estimated **\$520,000** of in-kind contributions by project lead agencies and partners to the initiative.

Further co-contributions from other parties will be sought during the course of the project, including industry partners.

### 6.1 Project expenditure

The majority of project expenditure will support UniSA and AAMT project staff to facilitate the initiative, and operating costs of two rounds of parallel pilot studies with schools and universities.

The budget breakdown for the proposal is as follows:

Expenditure Item	Budget \$	In-kind \$	Comment
Project team	313,000	94,000	Salary costs over three years
Environmental scan	31,000	50,000	Research and focus groups
Phase 1 pilot studies	108,000	108,000	Third-party costs equally shared
Phase 2 pilot studies	108,000	108,000	Third-party costs equally shared
Communications	50,000	120,000	Web portal/online communications
Evaluation and research	40,000	15,000	Evaluation and dissemination
UniSA Levy	133,000	25,000	UniSA infrastructure/communications
<b>TOTAL</b>	<b>\$783,000</b>	<b>\$520,000</b>	Excluding GST

Co-investment by project partners and sponsors will include:

- additional UniSA and AAMT staff and administration costs;
- teacher release time and school–university contributions to pilots and case studies;
- national and state conferences and forums organised by and with UniSA and AAMT – opportunities for engagement across all sectors and regions;
- industry contributions by negotiation.

The AMSPP grant does not include GST. Should GST be applicable, the project sponsor may vary the grant to take into account the effect of the GST.

### 6.2 Grant payments

Due date	UniSA instalment	AAMT payments
November 2014	\$261,000	
January 2015		\$100,000
May 2015	\$261,000	
June 2015		\$100,000
May 2016	\$261,000	
June 2016		\$100,000
<b>TOTAL</b>	<b>\$783,000</b>	<b>\$300,000</b>

# 7 Appendices

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## 7.1 Project governance

### Terms of reference for project reference group

- provide expert input and strategic advice to the [xe] project team;
- advise on the development, implementation and review of the project;
- assist the engagement and communication with project stakeholders;
- participate in teleconferences, workshops, forums and focus groups as appropriate.

### Reference group members and critical friends

- Professor Peter Buckskin (Chair), Dean: Indigenous Scholarship, Engagement and Research, University of South Australia
- Mr Will Morony, CEO, AAMT
- Dr Chris Matthews, Lecturer, School of Environment, Griffith University and Chair, Aboriginal and Torres Strait Islander Mathematics Association
- Mr Joe Sambono, Inquiry for Indigenous Science Students Manager, CSIRO
- Dr Kaye Price, Research Associate, More Aboriginal and Torres Strait Islander Teachers Initiative (MATSITI)
- Dr Roslyn Prinsley, National Adviser, Science and Maths Education and Industry, Office of the Chief Scientist
- Professor Robyn Jorgensen, Faculty of Education, Science, Technology & Mathematics, University of Canberra
- Mr Stephen Thornton, Department of Education, University of Oxford
- Associate Professor Grace Sarra, Faculty of Education, School of Cultural and Professional Learning, Queensland University of Technology
- Associate Professor Rowena Ball, Researcher – Mathematical Sciences Institute, Australian National University

## 7.2 Project team

UniSA	AAMT
<ul style="list-style-type: none"><li>• Professor Peter Buckskin, Project Director</li><li>• Professor Lester Irabinna-Rigney, Project Research lead</li><li>• Mark Tranthim-Fryer, Project Manager</li><li>• Brian Marshall, Project Officer</li><li>• Associate Professor Rob Hattam, Research Officer</li><li>• Co-opted research and project officers</li></ul>	<ul style="list-style-type: none"><li>• Mr Will Morony, CEO, AAMT. Project Director</li><li>• AAMT Manager, Indigenous Projects</li><li>• Co-opted project officers and developers</li></ul>

## 7.3 AMSP/AMT projects

Five AMSP-funded projects have partnered with AMT to co-develop a mathematics portal through which the professional resources developed during the projects will be made available to teachers of mathematics. The additional four projects, which will be called the AMSP *Maths Partnered Projects (MaPP)* are:

- *Towards Educating Mathematics Professionals Encompassing Science and Technology (TEMPEST)* – University of Tasmania (Professor Kim Beswick)
- *Maths Inside: Highlighting the role of mathematics in society as motivation to engage more in mathematical activities* – University of Technology Sydney (Dr Mary Coupland)
- *Reframing Mathematical Futures: Building a learning and teaching resource to enhance mathematical reasoning in Years 7 to 10 (RMF2)* – RMIT University (Professor Di Siemon)
- *National Mentoring for Science and Mathematics Teachers* – University of Canberra (Professors Mike Gaffney and Rob Fitzgerald).

AMT has established the MaPP Leaders Group to share project findings and, where appropriate, facilitate collaboration between the projects.

## 7.4 Contract reports and KPIs

Project plan reporting requirements from *Conditions of Grant* submitted and accepted on 30 March 2015. Refer to section 5.4 for a schedule of reporting obligations.

Reports	Activities	Key Performance Indicators
First Progress Report as specified in Part A item 6.1 including: <ul style="list-style-type: none"> <li>• progress report against key outcomes and milestones</li> <li>• define and describe project start-up activities</li> <li>• evidence of liaison with the Office of the Chief Scientist</li> <li>• evidence of broader networking and sharing of project results, including with other AMSP projects, science and maths teachers, professional bodies and/or conferences</li> <li>• CFO-certified financial statement for the 2014 calendar year.</li> </ul>	<i>Update Project Implementation Plan, including governance arrangements and Risk Management Plan and Stakeholder Communication Strategy Plan</i>	<i>Implementation plan developed</i>
	<i>Research ethics obligations established</i>	<i>Project Human Research Ethics approval</i>
	<i>Conduct AMSP project meeting and establish reference group</i>	<i>Project meeting held and reference group membership confirmed</i>
	<i>Conduct a literature review and environmental scan of existing pedagogy and university outreach programs</i>	<i>Report on findings of literature review and environmental scan of existing pedagogy and university outreach programs</i>
	<i>Set up student focus groups as part of Aboriginal Summer School for Excellence in Technology and Science (ASSETS) and identify participating Indigenous teachers and students</i>	<i>Three student focus groups established</i>  <i>30 teachers/Indigenous students identified to participate in focus groups</i>

## 7.5 Project schedule

A detailed schedule of project tasks is maintained in the [xe] *Project Schedule 2015–17* (Microsoft Project Plan/Gantt chart)

