Introduction

Flinders University and the Australian Science and Mathematics School (ASMS) share common values: excellence, innovation, collaboration and service to our communities.

The Australian Science and Mathematics School and Flinders are key contributors to the Science, Technology, Engineering and Mathematics (STEM) Skills Strategy for South Australia (SA). The Key Strategic Directions for 2014 – 2023 are innovative and forward thinking, enabling the School to graduate young students with the skills to progress into the next stage of their life.

A curriculum for the future, innovative pathways to get results, connecting to community, industry and international partners and achieving professional impact and influence, all align with aspects of the Flinders University Strategic Plan. The ASMS Flinders partnership, which enters its second decade, will strengthen through these shared aspirations for young people.

Flinders looks forward to working with ASMS to achieve the outcomes of the Strategic Plan 2014 – 2023.

**Professor Michael N Barber** FAA FTSE FAICD  
Vice-Chancellor, Flinders University
Foreword

The ASMS Strategic Plan 2014 - 2023 is a milestone in the evolution of the school, setting out a shared understanding of the organisation, its programs and the pathway forward.

The plan demonstrates how the ASMS will continue to innovate, define and redefine programs and activities to ensure that it continues to deliver quality education in STEM subjects. The production of this strategy also reflects the commitment of staff and key stakeholders through an 18 month period. The strategy provides a clear framework to guide the evolution of the school. It builds on the school’s successes during its first 10 years, and will utilise the significant outcomes achieved to date to shape the future of the school.

Driven by the efforts of the 2012 and 2013 Governing Councils, it is the distilled wisdom born of numerous “extra sittings” of council and collaboration with all of the ASMS stakeholders (ASMS staff, parents, students, Flinders University, the Department for Education and Child Development, STEM industry representatives) through brainstorming, mind-mapping, surveying and debating the elements that make the ASMS what it is today and, importantly, what it can be in the future.

I am immensely proud to have been a part of that process.

I am pleased to present to you the ASMS Strategic Plan 2014 – 2023, born of these many contributions, which will be a key guiding resource in shaping the essence of the ASMS for the next ten years and beyond.

Mike McAfee
Chair, ASMS Governing Council 2014
The Australian Science and Mathematics School (ASMS) was established in 2003 to provide leadership for reform and innovation in science and mathematics education through curriculum development, research and professional learning services.

The ASMS contributes to the Science, Technology, Engineering and Mathematics (STEM) Skills Strategy for South Australia (SA) through:

- its professional learning services about innovative curriculum design and pedagogy in Science and Mathematics aimed at encouraging more secondary school students to complete senior secondary STEM subjects
- the creation of an environment for interaction between leaders, educators, professional scientists and mathematicians within government, university and industry in South Australia nationally and internationally

Over the last 10 years, the School has supported educators from over 200 schools to develop engaging curriculum and innovative pedagogies to implement mathematics and science education based on the approaches developed at the ASMS.

The School has a number of key successes: the development of an open learning environment, interdisciplinary learning programs and pedagogy that amplifies the success of students in STEM learning and enhances their success at university. The School also has a very high rate of articulation into science, medical and engineering studies at a range of universities across Australia.
BUILDING ON OUR SUCCESSES
The School provides new ways of teaching and learning in science and mathematics through the creation of an environment for interaction between educators and professional scientists and mathematicians within institutions and industry in South Australia, nationally and internationally. The School’s partnership with Flinders University is a key platform for this interaction.

The ASMS is intended as a resource for every school in SA through its professional development and curriculum enhancement programs. Students and teachers from across South Australia are invited and encouraged to engage in individual and group visits to the ASMS outreach, exchange and vacation programs.

Teachers from around the state are able to work alongside ASMS staff in the ongoing development of the curriculum as well as teaching and assessment strategies. This work informs the review and planning of professional development priorities.

The school has had many successes, including:

- SA of the Year Award: Education (2008)
- Inventory Case; OECD Innovative Learning Environment Project (2011)
- The first school in SA with an online curriculum for all subjects through a secure portal enabling 24/7 communication between teachers, students and parents
- The formation of many productive partnerships (e.g. Flinders University and 6 international schools to found the International Student Science Fair network; LEaRN Network through Melbourne University).
- Attracting highly qualified teacher and award-winning teachers.
- Outstanding uptake of post-school pathways by students, with over 90% progressing to university and over 70% in science-related fields.
- Lighthouse for development and delivery of STEM professional development for teachers (e.g. in the Science in the Research Projects, Science Learning Centre, Advanced Technology Industry Partnerships and Teach SA)

Building on these successes will see a bold new direction for curriculum development and delivery, post school pathways, university, industry and international partnerships and professional learning that truly puts the student at the centre of everything we do at the Australian Science and Mathematics School.
At the ASMS we embrace the diversity of learning, encourage self-directed learning and place importance on collaborative learning for the entire ASMS community.

Our students shape their learning to best suit their own learning goals and learning styles. Our teachers are supported to learn in different ways.

**We encourage our teachers to**

- critically reflect on and to continually improve their capacity to deliver a leading-edge curriculum.
- develop engaging pedagogy that best meets the needs of each individual learner.
- pursue partnerships with community and industry that best support our students to learn and to achieve their post-school pathways in a variety of ways.

It is interesting to look back over 10 years and see the changes that have occurred in the general teaching and learning environment.
Some key impacts that this school is focused on are:

- The impact of the flexible and open learning environment on learning.
- The impact of the internet on communication and learning.
- Continued acceleration in knowledge generation and the development of deep conceptual learning.
- Personalising learning through the focus on developing the self-directed learner.
- Government focus on STEM education.
- A continued increase in global travel and communications.
- Changes to the South Australian Certificate of Education, with a particular interest in the Research Project.
At the ASMS students learn through interdisciplinary studies based in the new and emerging sciences with a strong focus on the self-directed learner. The natural extension to this is for teachers and students to work together to co-design learning.

We will:

Enable ASMS students to have the opportunity to co-design authentic learning programs in order to choose their own adventure through inquiry, experience and investigation.

Ensure that the learning experience is meaningful, authentic and rich with challenge, building resilience as students understand that they will learn from their successes and their mistakes.

Support students and teachers to make wise choices, enabling them to be responsive to new opportunities.

Ensure that the adaptive learning environment changes in response to the feedback from the learners, teachers and partners.

Actions:

• Innovate the central studies in years 10 and 11 by exploring new concepts for interdisciplinary STEM curriculum.

• Co-design refined personalised learning programs, meaningful learning activities and adaptive learning environments.

• Explore and implement co-design and interdisciplinary learning opportunities in Stage 2 (year 12).

• Develop, implement and evaluate strategies to support students and teachers to undertake authentic co-design that best meets the learning requirements of individual students.
Co-design process developed in the Central Studies (years 10 and 11), year 12 and for portfolio accreditation (PATE).

Prepared co-design frameworks introduced as an option to the Central Studies. This may include experimental studies, developing your own program or research opportunities.

Options for co-design are operational and used in the PATE for SACE. An extension layer on the assessment rubric is in place and used by students for PATE negotiations.

Design process for co-design is fully documented and sought after.
Students at the ASMS have many options to achieve and pursue their preferred post-school pathways. To be successful, all students need to develop a range of capabilities and dispositions that support them in their future pathways.

We will:

Support ASMS students to articulate the knowledge acquisition skills and capabilities valued by the STEM industries.

Develop the ASMS Accreditation that is highly valued by the community because it knows that ASMS graduates will have the self-efficacy, confidence and ethical frameworks to succeed.

ASMS graduates will be known to be creative and resilient thinkers with the ability to integrate ideas.

Actions:

• Develop accreditation and recognition processes with universities, starting with the Pathways to Tertiary Entrance (PATE) with Flinders University.
• Provide connected pathways and opportunities.
• Use data to inform our work so that all students are supported through an appropriate post-school pathway.
Indicators

2014
PATE drafted and introduced as a working document; destination data process developed and trialled.

2015
PATE operational for selected degrees at Flinders University; destination data process in place.

2018
Implementation across other universities e.g. Flinders University, University of South Australia, Adelaide University, selected international universities.

2023
Guaranteed entrance with PATE into any degree in any South Australian University.
Partnerships with the ASMS community including our alumni and industry, along with those of partner schools both within and beyond Australia are vital to a flourishing learning environment at the ASMS. The further development of these partnerships guides our third strategic direction.
We will:

Ensure that ASMS students can be confident that their learning environment and curriculum are supported and enhanced by our community and industry partners, and in particular, the Flinders University.

Ensure client and partner feedback informs the development of the curriculum, enriching the opportunities for authentic and cutting edge learning and post school pathways.

Build educational partnerships that are continually fostered, especially with our state and partner national and international schools to enrich the STEM education community locally, nationally and globally.

Actions:

• Work with our school community partners to ensure that their voice is heard and that their feedback is reflected in our practice.

• Improve parent engagement and develop and implement a process for client feedback.

• Engage in robust conversations with our university partners, especially Flinders University, to plan, document and implement strategies that best meet the needs of all partners.

• Actively pursue industry partners who can value add to the student inquiry programs of the ASMS and our dedicated time for serious play, while also increasing their own social and professional capital through their work with us.

• Maintain and extend local, national and international partnerships that contribute to the ASMS efforts in maintaining our position as a leader in STEM education.

Indicators:

2014

Flinders University partnership delivering support for student inquiry.

Strategy for collecting client feedback (parents, students) developed and in place.

2015

Innovation Space supported by strategic partners.

Focus on industry partnership development.

2016

Response to client feedback evident and reported.

National and international education partnerships reviewed and realigned to shared vision and approach.

2018

Industry partnerships in place and developing.

2023

Fully articulated and documented partnerships in place.
We will:

Encourage ASMS teachers to be recognised as well qualified educators who can negotiate high standard learning programs that have the potential to develop the thought leaders of the future.

Support teachers to build an academic program that students can access on site and online and which includes accredited courses and STEM activities.

Welcome educators from across the world who participate in accredited ASMS professional learning programs.

Celebrate the impact of the ASMS Graduates.

Actions:

• Promote ASMS as a Centre of Innovation for transforming STEM education.
• Continue to be proactive and responsive to influence policy at the state and national level.
• Build capacity to support the development of contributive educational leadership to promote innovative practices.
• Provide professional development services to support transformative STEM education.
• Track and document the achievement and impact of ASMS graduates.

Teacher quality matters in quality education. The School’s Charter requires that the ASMS provides professional learning services about innovative and engaging STEM curriculum and assessment design, and pedagogical practices.
Information system to collect and collate professional learning data in place; post-destination research resourced; possibilities for online and accredited courses scoped; processes for policy development scan in place.

Build online professional learning services; ASMS accreditation scoped; involvement in policy development documented.

Uptake of professional learning services is documented and reported; ASMS accreditation process in place.

Online professional learning reports ASMS accreditation.

Impact can be described by the data.
Partnerships and Memoranda of Understanding with other schools

2004

1/12/2004  SciMatInternational Network Memorandum – ASMS / Ritsumeikan Junior & Senior High School/ Mahidol Wittayanusorn School

1/12/2004  Memorandum of Partnership – Ritsumeikan Junior & Senior High School

1/12/2004  Memorandum of Partnership – Mahidol Wittayanusorn School

2005

27/6/2005  Memorandum of Partnership – Busan Science Academy

2009

19/2/2009  Memorandum of Partnership – Københavns VUC

27/11/2009  Memorandum of Partnership – Middle School Affiliated to Shandong University

2010

02/3/2010  Memorandum of Partnership – Princess Chulabhorn’s College Mukdaharn
Awards

2006  ACHPER Excellence in Health and Physical Education

2006  Inclusion in the OECD Compendium of Exemplary Educational Facilities

2008  South Australian of the Year: Education category

2008  South Australian Science and Engineering Challenge

2009  South Australian Science and Engineering Challenge

2011  South Australian Debating Open Champions

2011  ACHPER Excellence in Health and Physical Education

2011  Inventory Case; OECD Innovative Learning Environments Project

2013  Garth Boomer Award. Australian Curriculum Studies Association

2014  Australian Space Station Design Competition winner