

Department for Education External School Review

Partnerships, Schools and Preschools division

Report for Australian Science and Mathematics School

Conducted in September 2021



Review details

Our education system aspires to become the best in Australia by seeking growth for every student, in every class and in every school.

The purpose of the External School Review (ESR) is to support schools to raise achievement, sustain high performance and to provide quality assurance to build and sustain public confidence in government schools.

The External School Review framework is referenced throughout all stages of the ESR process.

This report outlines aspects of the school's performance verified through the review process according to the framework. It does not document every aspect of the school's processes, programs and outcomes.

We acknowledge the support and cooperation provided by the staff and school community. While not all review processes, artefacts and comments are documented here, they have all been considered and contribute to the development and directions of this report.

This review was conducted by Meredith Edwards, Review Officer of the department's Review, Improvement and Accountability directorate and Tony Hall and Rob McLaren, Review Principals.

Review Process

The following processes were used to gather evidence relevant to the lines of inquiry:

- Presentation from the Principal
- Class visits
- Attendance at staff meeting
- Document analysis
- Discussions with:
 - Governing Council representatives and parents
 - Leaders
 - School Services Officers (SSOs) and Youth Worker
 - Students
 - Teachers and tutorial support person.

School context

Australian Science and Mathematics School caters for young people from years 10 to 12. It is situated 12kms from the Adelaide CBD. The enrolment in 2021, as at the February census, is 369. Enrolment at the time of the previous review was 386. The local partnership is Marion Inland.

The school has a 2020 ICSEA score of 1083 and is classified as Category 5 on the Department for Education Index of Educational Disadvantage.

The school population includes less than 6 Aboriginal students, 2% students with disabilities, 27% students with English as an additional language or dialect (EALD) background, no young people in care and 46 students eligible for School Card assistance.

The school leadership team consists of a Principal in their 5th year of tenure, Deputy Principal: Learning Culture, Senior Leader: Director of Professional Learning, Senior Leader: Mathematics and Learner Analytics, Senior Leader: Science and Partnerships, a Business Manager and an ICT Manager.

There are 41 teachers including 4 in the early years of their career and 5 Step 9 teachers.

The previous ESR were:

- Direction 1** **Develop agreements on how to effectively monitor and evaluate student growth to better inform learner and teacher practice.**
- Direction 2** **To what extent are students engaged and intellectually challenged in their learning?**
- Direction 3** **Develop agreement about what is effective student agency and co-construction of learning and build student and teacher capacity to further support the development of self-directed learners.**
- Direction 4** **Review and evaluate existing partnerships in learning as a first step in the development of plans and agreements for ongoing partnership development, which support the interdisciplinary approach of the school, have reciprocal value and are sustainable**

What impact has the implementation of previous directions had on school improvement?

The Australian Science and Mathematics School (ASMS) has attended to the directions of the previous review with careful consideration. While there are no written agreements about how to effectively monitor and evaluate student growth to better inform teacher practice, there is clear evidence of this being a priority in the school. The recently appointed learning analytics leader confidently navigates a model of multiple and intersecting data sets of demographic, process, perception and achievement information. The use of this model enables the leadership team to investigate reasons for the gaps between expected and actual achievement and variable student dispositions in their prioritising of learning in certain subjects. Systems data to measure achievement progress of the students who enrol in this senior secondary school in Year 10 is not available until the final high-stakes assessments of South Australian Certificate of Education (SACE) Stage 2. The school recognises that there is further work needed in the use of standardised student achievement data in monitoring and evaluating the impact of improvement strategies in the school. The role of data in setting measurable targets in areas such as writing improvement, measured through Learning English Achievement and Proficiency (LEAP) levels and grades, will play a stronger role in the next iteration of the Site Improvement Plan (SIP).

The school regularly reviews both curriculum design and the effectiveness of evidence-based pedagogies to provide for engaging and intellectually challenging learning. Student agency is a key feature with 'Learning @ ASMS' defining student agency as, 'Involving the learner in making meaningful decisions about their learning enables personalisation by the learner, not for the learner. Using information about their learning supports students to understand themselves as learners, developing the capacity to self-direct and self-regulate learning identifying learning directions and goals that are personally challenging and encouraging a growth mindset.' All students highlighted self-directed learning as a key feature of the ASMS, when speaking with the panel. Learning studies groups focus on the explicit development of students as self-directed learners who have opportunities to co-design their learning.

Partnerships with tertiary institutions, businesses and industries provide authentic contexts for intellectually engaging learning at ASMS. Collaboration with universities such as Flinders University add value to learning that is cutting edge in science, mathematics and Science, Technology, Engineering and Maths (STEM). This long-standing partnership has been recently reviewed and strengthened with the following outcomes:

- Consultation processes that more closely embed the school in the university's strategic agenda.
- Increased alignment of each institution's teaching-research practice which is clearly evident in the school's refinement of their Learning Studies program.
- Shared participation in opportunities to respond to key national policy documents reflected in the co-authored 'White Papers' detailing cutting edge approaches to learning in STEM.

The school has reduced the number of partnerships with universities and businesses to ensure their sustainability while, at the same time, being flexible to engage in emerging partnerships such as aviation and space research. Initial work has been undertaken to develop measures to systematically evaluate the educational and professional learning benefits from each partnership.

Lines of inquiry

Effective school improvement planning

How well does the school review and evaluate the effectiveness of its improvement planning processes and impact on student learning to inform next steps?

The Australian Science and Mathematics School (ASMS) uses multiple measures in sophisticated ways to investigate how best to maximise student engagement and further achievement. These multiple measures include demographics, perceptions, processes and to a lesser extent student learning achievement data. This sophisticated approach to data analysis and the appointment of a learner analytics leader highlights the school's commitment to catering for the increasing diversity in their student cohort. The important intersection between process data relating to learning programs, perception data from student feedback and learner achievement **has the potential to** build the school's ability to measure the impact of actions in line with the Challenges of Practice and to inform next steps in school improvement planning.

As a senior secondary school, without the direction of NAPLAN data or successive diagnostic data from Progressive Achievement Test (PAT) testing, the school relies on grade data, Learning English Achievement and Proficiency tool (LEAP) levels and South Australian Certificate of Education (SACE) results. While the school is confident of the validity and reliability of the grade data due to quality assured moderation processes, the lack of achievement data in setting measurable targets for improvement in numeracy is evident in both the Site Improvement Plan (SIP) (2019-2021) and in the school's Strategic Plan. Steps 4 and 5 of the SIP focus primarily on processes the school has successfully established and their impact on teaching rather than the impact on student achievement. While the school has high impact processes to survey student perceptions and learning growth reflections, greater use of measurable achievement data would provide greater clarity in knowing the impact of specific improvement strategies. This is an area that the school's senior leadership and literacy and numeracy leaders acknowledge as requiring further attention.

Direction 1 Identify specific data sets to establish measurable targets to evaluate the impact of actions addressing the Challenges of Practice in the Site Improvement Plan.

Effective teaching and student learning

How effectively are teachers using evidence-based pedagogical practices that engage and challenge all learners?

ASMS is at the leading edge of interdisciplinary curriculum design and pedagogies that promote student agency in inquiry learning. Within this unique educational setting, teachers are able to push the boundaries of effective, evidence-based teaching practices. Teacher capacity to explore a wide selection of pedagogies has been enhanced by the appointment of an innovative pedagogies leader who researches and seeds interest in this field. The open space team teaching environment further promotes the modelling and adoption of pedagogies, enhanced by cutting-edge interactive technologies.

Evidence-based pedagogies are assessed in terms of the unique context of the school and the extent to which they align with the school's three core values of 'curiosity', 'agency' and 'community'. This synergy between values, curriculum design and pedagogy is demonstrated not only through the focus of professional discussions but also in curriculum documentation. 'Curiosity' and 'agency' are key to the design of curriculum units. Not only is there clarity of learning intentions in terms of what students will know, understand and be able to do but long-term transfer goals articulate the importance of curiosity about future trends in the fields of science, technology, engineering and mathematics. Students are challenged to appreciate future trends, consider ethical implications and complexities in their fields of study, enjoy engineering as 'an art form' and incite curiosity about the world around them. Importantly, as learners, they are encouraged to, 'Ask lots of questions and take some time to do the necessary research to satisfy those curiosities.' Such levels of curriculum design are intentional and carefully considered.

The External School Review team observed this highly sophisticated planning and review of curriculum units in central studies team meetings. These are interdisciplinary teams with a balance of content, pedagogical, literacy and numeracy expertise. In the review of assessment tasks and rubrics, discussion focuses on the extent to which a task engages and challenges learners. There is an opportunity for a similar standard of quality assurance processes to underline the importance of the fidelity and consistency of the implementation of key pedagogies in the enactment of this innovative curriculum.

Direction 2 Develop a contextually appropriate framework of effective teaching to provide greater consistency in the implementation of agreed pedagogies in all classes.

Conditions for effective student learning

To what extent does the school provide and monitor a safe, supportive and respectful environment to maximise engagement, wellbeing and achievement?

'Community' is a core value of the school. Commitment to this value is evident in the respectful relationships between teachers and students, interactions between students and the professional collaboration between colleagues. Underpinning this community is a deep commitment to wellbeing for learning which acknowledges the increasingly diverse range of social, cultural and gender identities in the student population. This was highlighted in conversations with students, teachers and parents. Close attention is paid to the shifting demographics of the student population. Hence, the data analytics leader is an important member of the working group which focuses on wellbeing for learning.

Students report feeling safe as the school has intentionally created a safe and inclusive environment characterised by respectful relationships which enables them to focus their emotional and intellectual energies to engage in challenging learning.

While wellbeing has always been high on the school's agenda, since 2018 the school has adopted a more proactive approach to attending to the wellbeing needs of its students and staff. Because the school is mandated to be at the leading edge of innovative learning, they also aim to be at the leading edge of the underpinning role of wellbeing in student learning. To this end, the school is working with a wellbeing consultant who proposes a contextual wellbeing model. The model guides schools to attend to the key foundational domains of people, social norms, physical space and policy & procedures. In this way, inclusivity and wellbeing are more than words on a prospectus. Rather, they are instilled in school policies and practices creating the conditions for students to flourish as learners.

Direction 3 **Co-design with students professional learning that builds teacher capacity to provide a safe, inclusive and respectful environment for an increasingly diverse student cohort.**

Outcomes of the External School Review 2021

It is appropriate, given the school's focus on the sciences that a parent and strong advocate of the school described it as an ecosystem. The school is an educational community of complex and interacting parts. Due to the thoughtful attention to interrelationships between all aspects of school planning and operations, there is strong alignment between school values, vision, improvement priorities, curriculum design, pedagogies, policies, professional learning, and attention to wellbeing. Guided by the school's core values of curiosity, agency and community, learning takes place within an interdisciplinary context. The curriculum is designed to build on student passion and curiosity and pedagogies support student agency and inquiry in their learning. Students who seek agency and challenge in their learning and attention to the wellbeing underpinning their ability to be extended by taking risks flourish in this school.

The Principal will work with the Education Director to implement the following directions:

- Direction 1** Identify specific data sets to establish measurable targets to evaluate the impact of actions addressing the Challenges of Practice in the Site Improvement Plan.
- Direction 2** Develop a contextually appropriate framework of effective teaching to provide greater consistency in the implementation of agreed pedagogies in all classes.
- Direction 3** Co-design with students professional learning that builds teacher capacity to provide a safe, inclusive and respectful environment for an increasingly diverse student cohort.

Based on the school's current performance, Australian Science and Mathematics School will be externally reviewed again in 2024.



Kerry Dollman
Director
Review, Improvement and Accountability



Anne Millard
Executive Director
Partnerships, Schools and Preschools

Jayne Heath
Principal
Australian Science and Mathematics School

Governing Council Chairperson

Appendix 1

School performance overview

The External School Review process includes an analysis of school performance as measured against the Department for Education Standard of Educational Achievement (SEA).

Reading

The Australian Science and Mathematics School caters for students from year 10 to 12 and does not participate in NAPLAN testing. However, the school makes use of Progressive Achievement Testing (PAT) data in reading for diagnostic purposes at an individual and cohort level. In 2020, 96% of year 10 students achieved the SEA whereas in 2017 84% achieved the SEA.

Numeracy

The Australian Science and Mathematics School caters for students from year 10 to 12 and does not participate in NAPLAN testing. However, the school makes use of Progressive Achievement Testing (PAT) data in numeracy for diagnostic purposes at an individual and cohort level. In 2020, 95% of year 10 students achieved the SEA whereas in 2017 83% achieved the SEA.

SACE

In terms of SACE completion in 2020, 83% of students enrolled in February and 98% of those enrolled in October, who had the potential to complete their SACE, did go on to successfully achieve SACE. This result for October SACE completion represents an improvement from the historic baseline average.

For compulsory SACE Stage 1 and 2 subjects in 2020; 99% of students successfully completed their Stage 1 Personal Learning Plan, 100% of students successfully completed their Stage 1 literacy units, 96% successfully completed their Stage 1 numeracy units and 100% successfully completed their Stage 2 Research Project.

For attempted Stage 2 SACE subjects in 2020, 98% of grades achieved were at 'C-' level or higher, 28% of grades were at an 'A' level and 44% of grades were at an 'B' level. This result represents an improvement for the 'C-' level or higher grade, an improvement for the 'A' level grade and little to no change for the 'B' level grade, from the historic baseline averages. Between 2018 and 2020, the trend for 'C-' or higher has been upwards, from 97% in 2018 to 98% in 2020.

Zero percent of students completed SACE using VET and there were 2 students enrolled in the Flexible Learning Options (FLO) program in 2020.

In terms of 2020 tertiary entrance, 91%, or 97 out of 107 potential students achieved an Australian Tertiary Admission Rank or TAFE SA selection score. There were also 4 students who were successful in achieving a merit.

In 2020, the school had only a slight moderation adjustment, isolated to 3 students in 2 classes.