

Date: 6 June 2019

Report Title: STEM Statement – July 2019

ASTA, on behalf of its member State Science Teacher Associations, advocates and are committed to providing STEM (Science, Technology, Engineering and Mathematics) education for all Australians and is actively seeking to address the barriers to participation in STEM learning including disadvantaged and underrepresented cohorts, such as females, students from lower socioeconomic groups and Aboriginal and Torres Strait Islander students.

They acknowledge that STEM education is critically important for Australia's current and future productivity and that STEM skills are pivotal to building a prosperous economy and better societal outcomes for all Australians.

They support the view that this knowledge and skills are greatly enhanced through an interdisciplinary approach to teaching and learning of the STEM disciplines.

An interdisciplinary approach provides students with the opportunity to integrate content, key ideas and approaches from science, technology, engineering and mathematics to understand complex problems and to develop and apply critical and creative thinking skills to solve them.

However, whilst ASTA affirms the interdisciplinary approach to STEM education, it does not imply or suggest that schools should replace discreet discipline teaching and learning.

ASTA recommends that all interdisciplinary STEM activities should complement and support the integrity of the individual disciplines and that students are equipped with the necessary foundational discipline knowledge to avoid conceptual gaps.

To facilitate this outcome for students, ASTA supports improvement in teacher quality and capacity in STEM by providing professional development opportunities which explore innovative teaching and learning approaches to the STEM disciplines.

With regular, structured, meaningful and collaborative professional development, teachers in the STEM disciplines can gain experience in the cross-disciplinary teamwork and collaboration expected of their students in STEM.

ASTA and the Science Teachers Associations in each state and territory are actively working with Federal, state and local education authorities and systems and external partners across Australia to deliver this professional support for primary and secondary teachers.

Date: July 2019

To be reviewed: July 2020

References:

1. Education Council Services (Education Council), (2015), *National STEM School Education Strategy: 2016-2026*, Accessed: www.educationcouncil.edu.au/site/DefaultSite/filesystem/documents/National%20STEM%20School%20Education%20Strategy.pdf
2. Office of the Chief Scientist, (2014), *Science, technology, engineering and Mathematics: Australia's Future*, Australian Government, Accessed: http://www.chiefscientist.gov.au/wp-content/uploads/STEM_AustraliasFuture_Sept2014_Web.pdf
3. Prinsley R. & Johnston, E., (2015), *Transforming STEM teaching in Australian primary schools: everyone's business*, Office of the Australian Chief Scientist, Accessed: www.chiefscientist.gov.au/wp-content/uploads/Transforming-STEM-teaching_FINAL.pdf
4. Tytler, R., Hobbs, L., & Prain, V., (2016), *Towards a re-positioning of STEM Education*, Accessed: <https://blogs.deakin.edu.au/steme/wp-content/uploads/sites/39/2017/04/STEM-Ed-forum-position-paper.pdf>
5. Australian Academy of Science, (2019) *Women in STEM Decadal Plan (Australian Academy of Science)*, Accessed: www.science.org.au/support/analysis/decadal-plans-science/women-in-stem-decadal-plan
6. Government of Tasmania, Department of Education, (n.d.), *STEM: Preparing today's students for tomorrow*, Accessed: <https://stem.education.tas.gov.au/>
7. Northern Territory Government, (2018), *STEM in the Territory 2018-2022*, Accessed: https://education.nt.gov.au/_data/assets/pdf_file/0011/591950/STEM-Territory-18-22-web.pdf
8. State of Victoria (Department of Education and Training), (2016), *STEM in the Education State*, Accessed: www.education.vic.gov.au/Documents/about/programs/learningdev/vicstem/STEM_EducationState_Plan.pdf
9. Government of South Australian (Department for Education and Child Development), (2017), *STEM Learning - Strategy for DECD Preschool to Year 12: 2017 -2020*, Accessed: <https://www.education.sa.gov.au/sites/g/files/net691/f/decd-stem-strategy-2016.pdf>
10. Government of Western Australia (Department Jobs, Tourism, Science and Innovation), (n.d.), *Future jobs, Future skills: Driving STEM skills in Western Australia*, Accessed: www.jtsi.wa.gov.au/docs/default-source/default-document-library/future-jobs-future-skills---driving-stem-skills-in-western-australia8ae70fa57ba2628e86e4ff0000981137.pdf
11. NSW Parliamentary Research Services, (2017), *STEM education in NSW schools*, e-brief 5/2017, Accessed: <https://apo.org.au/sites/default/files/resource-files/2017/09/apo-nid108291-1158256.pdf>
12. State of Queensland (Department of Education and Training)(2016), *A strategy for STEM in Queensland state schools*, Accessed: <https://advancingeducation.qld.gov.au/ourPlan/Documents/schools-of-the-future-stem-strategy.pdf>
13. Victoria Parliament, Education and Training Committee, (2006), *Inquiry into the promotion of mathematics and science education: Final report, Chapter 5 Trends in Student Achievement Mathematics and Science*, pp 99-124, Melbourne: The Committee. Accessed: www.parliament.vic.gov.au/archive/etc/pdf/MS_PDF_files/Ch5_Achievement.pdf
14. Queensland Curriculum and Assessment Authority, (2016), *Student achievement in mathematics and science - International data: PISA and TIMMS*, Accessed: www.qcaa.qld.edu.au/downloads/publications/report_student_achievement_maths_science.pdf
15. Bybee, R. W., (2013). *The case for STEM education: Challenges and opportunities*. Arlington, VA: NSTA Press.
16. National Academy of Engineering and National Research Councils, (2014), *STEM Integration in K-12 Education: Status, Prospects and an Agenda for Research*, The National Academies Press.