Dear Minister,

**Re: Review of the Australian Curriculum**

The signatories to this letter, the Australian Academy of Technological Sciences and Engineering (ATSE), Engineers Australia (EA), the Australian Council of Engineering Deans (ACED) and the Warren Centre for Advanced Engineering (TWC) welcome the Government’s public support for Science, Technology, Engineering and Maths (STEM) subjects in schools. This is essential for underpinning and strengthening Australia’s capabilities and several Government programmes.

We are, nevertheless, concerned by the implications of some of the recommendations of the recent *Review of the Australian Curriculum* in Technologies. Most critical is the proposal that the learning area (Technologies) should be introduced from Year 9, not as previously proposed from foundation schooling. In this we are mindful of the position stated jointly earlier this year by the Australian Chief Scientist and the Chief Executive of the Business Council of Australia:

“... it will be people, ideas and innovation that underpin a successful Australian economy… This starts by ensuring school students have the world’s best literacy and numeracy skills. It also means starting to equip students early in science, technology, engineering, and mathematics (STEM), as well as so called “soft skills” like adaptability, design thinking and problem solving.”

Technologies, as defined in the Australian Curriculum document encompasses two complementary strands, Digital Technologies and Design & Technologies. They also complement Science and Mathematics in teaching the STEM skills that the Chief Scientist and others have identified are required for 75% of the fastest growing occupations. The Technologies curriculum includes both the technological dimensions and the “soft skills” referred to above.

Whilst we accept that curriculum overcrowding might be relieved by combining the two strands and incorporating them within other subjects such as Science and Mathematics in Primary and early High School, we also believe that Technologies considerably enhance these subjects by providing rich project based learning environments, and develop themes of learning that are critical to students’ learning and their futures.

There is abundant national and international evidence that school students are highly motivated by early learning experiences with a range of technologies. The highly consultative development of the ACARA Technologies subject provided the opportunity to mainstream and broaden these experiences in formal, exciting, relevant and connected curriculum. Notable examples of input into school curricula in this area include the STELR (*Science and Technology Leveraging Relevance*) program and Re-Engineering Australia.

The current Technologies Curriculum integrates development of two important personal attributes that are intrinsic to the subject area: systems thinking (for creating preferred futures and solutions through design), and project management. The curriculum includes highly
relevant and accessible contexts for learning: materials, design, food and fibre production, engineering principles and systems, food technologies, and digital systems. Concepts of computation thinking, including data representation and algorithm development (programming) are developed. These areas are rich in material that link to modern social and industrial development, recognised as important by the curriculum reviewers.

Higher education for professional capability in all of these areas figures strongly in any vision of Australia’s future. As the Chief Scientist has pointed out, we are producing too few food and agriculture scientists to satisfy our needs, and recent reports of the former Australian Workforce and Productivity Agency (now in the Department of Industry) have identified broad deficiencies in the supply of ICT specialists and engineers.

These shortfalls start with the diminishing proportion of High School students electing to study the precursor subjects necessary for the relevant University courses and skilled STEM workers in technician, technologist, scientist and engineer levels, and we argue that early introduction of the ideas and concepts in the Technologies Curriculum will lead to an increase in the STEM subject participation rate in later years. Evidence shows that the early engagement of students prior to high school is crucial to their long term acceptance of career opportunities.

It is therefore our view that the core principles and content of the Technologies Curriculum developed by ACARA should be retained. The curriculum follows that of other jurisdictions that have introduced computing, and modern design and technologies, but is also groundbreaking. We also acknowledge that further work on the curriculum and its connections to other subject areas are warranted, and that its implementation will need additional effort and investment in pre-service and post-registration teacher training. Our organisations are committed to continue to support such efforts.

We urge that at the 12 December 2014 meeting of the Education Council, all Federal and State Education Ministers reject the recommendation of the Review that Technologies be introduced only from Year 9 of the Curriculum.

We are happy to discuss this matter further and would be pleased to work with Federal and State Governments to ensure the successful implementation and ongoing support of the published ACARA Technologies Curriculum.

Yours sincerely

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