NSW Response to the Draft Shape of the Australian Curriculum: Technologies

Introduction
The Board of Studies NSW is working with the education sectors and teachers in NSW to support ACARA in the development of the Australian Curriculum: Technologies and to provide input and feedback on the development of this curriculum. This report is the NSW response to ACARA regarding the Draft Shape of the Australian Curriculum: Technologies.

The Board of Studies NSW’s consultation included:

- K–12 focus group meetings attended by teachers with expertise in a range of Technology subjects
- a reference group of education sector and industry representatives and academics
- an online survey on the Board of Studies website available from 14 March to 12 June 2012.

Summary of Key Issues
The Board’s consultation meetings and online survey indicated that the Draft Shape of the Australian Curriculum: Technologies requires further clarification of the scope and direction for a quality Technologies curriculum and to provide a sound basis to guide writers.

During consultation the following key issues were raised:

- the draft shape paper does not represent a curriculum structure that provides the basis for a quality Technologies curriculum
- a more succinct format for the shape paper needs to be developed, including language and terminology that is clear, concise and consistently understood by all teachers. A review of the amount of content and detail is also required.
- the shape paper should provide for sufficient scope and depth of investigation of a range of technologies
- a clearer link is needed between the overarching ideas described in the aims, the nature of the Technologies learning area and the content of the scope and sequence of the Australian Curriculum: Technologies
- a clearer distinction is required between Digital technologies and Information and Communication Technology (ICT) including how ICT is to be integrated and presented in Design and technologies and Digital technologies
there should be one integrated subject in K–8 (Technology), which incorporates content from Design and technologies and Digital technologies.

**Specific comments relating to sections of the Draft Shape of the Australian Curriculum: Technologies**

- **Introduction (para 17–para 20)**

There was overall support for the Introduction that recognises Technologies as an active, creative, engaging and diverse learning area that fosters students’ capacity to be discriminating and informed users, producers and innovators of technologies.

- **The contribution of Technologies education to students’ lives (para 21–para 25)**

There was strong agreement about the valuable contribution technologies education makes to students’ lives. There was some concern that the emphasis was on the contribution of Digital technologies and ICT. It was noted that the concepts of designing, design thinking and design processes, fundamental to the learning area, required further recognition in particular as Design and technologies is one of the proposed strands in F–8 and is proposed as an elective in Years 9–12.

- **Technologies education for diverse learners (para 26–para 29)**

There was strong agreement that the draft shape paper acknowledges the importance of Technologies education for all learners. There was also support for recognition that students in Australian classrooms have multiple, diverse and changing needs that are shaped by individual learning abilities, as well as gender, cultural and language backgrounds and socio-economic factors.

- **Nature of the Technologies learning area (para 30–para 47)**

There was support for the description of the nature of the Technologies learning area. There was a common view presented through consultation that the overarching statements require clarification and that the language and terminology requires review to avoid confusion, repetition and inconsistencies. For example terms such as ‘computational thinking skill’, ‘foundational to design’ and ‘foundation’, ‘early years schooling’ and ‘younger students’, and the use of and definition of ‘design’, ‘design process’, ‘technology processes’, ‘technology, problem solving processes’, ‘creativity’, ‘technology thinking terminology’ are used variously throughout the document.

Respondents commented that Technologies processes and production emphasises problem solving over design and that ‘design’ concepts need to be enhanced and represented as a fundamental aspect and process that supports all Technologies areas. It was also suggested that further explanation of the study of materials and their properties be considered.

Teachers in primary schools recognised the importance of playfulness and hands-on exploration in the early years of learning. They noted that play and exploration are some ways that students learn, but the shape paper does not acknowledge what students can do conceptually and in practice. Learning through play activities or play-based learning would be more appropriate.
K–6 teachers also commented that project management was an area of concern as there is an assumption that K–6 teachers have the skills and knowledge to explicitly teach these skills. It was noted that project management is more teacher directed than student directed, especially in the early years and that project work is highly scaffolded in order to teach students how to manage project work. The focus in the early years should be on teaching students to work collaboratively and on providing cooperative learning opportunities.

Similarly, the complexity of ‘computational thinking skills’ and high skill-based thinking required by K–8 teachers should be reviewed with regards to expectations of knowledge, understanding and skill.

- **Aims (para 48–para 49)**

There was support for the Aims and that they appropriately describe the knowledge, understanding and skills that a range of students are expected to develop and are evidence of contemporary learning and 21st century skills.

- **Structure (para 50–51)**

The proposed structure of the Australian Curriculum: Technologies in two strands: Design and technologies and Digital technologies for K–8, does not preclude schools from integrating the strands in teaching and learning programs. However, it is unclear how the curriculum for Years 9–12 will distinguish between the two Technologies subjects: Design and technologies and Digital technologies, and their complementary substrands. For example, in Design and technologies, processes and production focus on design, produce and evaluate, while in the Digital technologies, processes and production focus on create digital solutions. In reality, creating digital solutions uses a design, produce and evaluate process.

There was very strong support for one subject Technology in K–8 that incorporates content from Design and technologies and Digital technologies. It was noted that this would allow for greater flexibility to develop diverse and integrated units of work.

There was concern that non-specialist teachers in primary schools do not have sufficient expertise in teaching Digital technologies, especially the programming concepts associated with computational thinking skills and the application of these skills in teaching and learning.

For the senior years there was comment that the development of a single subject, Digital technologies, may not provide opportunities for investigation of the diversity of this learning area with appropriate breadth and depth as is currently offered in NSW.

- **Overarching idea: Engaging in creating preferred futures, (para 52– para 53)**

Respondents commented that the nature of preferred futures requires further explanation and differentiation in relation to Sustainability and should be included as a key term to ensure a consistent interpretation.
• **General capabilities and Cross-curriculum priorities (para 73–para 97)**

Overall the General capabilities and Cross-curriculum priorities are well presented and appropriate. The following matters were raised by the participants in the focus and reference groups.

There is ambiguity in the distinction between Information and Communication Technologies (ICT) and Digital technologies. Statements referring to students being ‘effective users’ of ICT and becoming ‘confident developers’ in Digital technologies do not clarify the differences between ICT and Digital technologies. Students undertaking the Digital technologies strand/subject should become both effective users and confident developers.

Further clarification is needed about how ICT is to be integrated in Design and technologies and Digital technologies. A mapping of ICT content across the Australian Curriculum: Technologies and other subjects should be undertaken so that content is sequential and complementary.

Sustainability is a fundamental component in technology and needs to be embedded and given more prominence in all aspects of the Technologies curriculum. A clearer indication regarding the type of sustainability, for example food security and environment, in place of more generalised statements, is needed.

• **Organisation of the Australian Curriculum: Technologies (para 98–para 102)**

A key concern raised during consultation was the notional proposed hours for the Australian Curriculum: Technologies. There was comment that consideration be given to the nature and diversity of the Technologies learning area and the implications for writers to produce a quality curriculum that covers the breadth and depth of content associated with this learning area.

• **Scope and Sequence of the Australian Curriculum: Technologies (para 103–para 132)**

Feedback from consultation generally supported the general overarching ideas and content for the Scope and Sequence of the Australian Curriculum: Technologies. Comments at consultation raised the need to ensure that stage-appropriate content is developed throughout the bands and that mapping of content for Design and technologies and Digital technologies should be undertaken to ensure a workable developmental continuum.

There is also a need for further development and refinement of the content, concepts and capabilities required by students in K–2. Primary teachers indicated the need to separate K–2 into Kindergarten and Years 1–2, taking into account that the nature of learning in Kindergarten varies from that in Years 1 and 2.

Other comments raised at consultation include the need to make skills development and collaboration and team work more explicit. There was also feedback regarding the introduction of content relating to safety, social and ethical issues such as the digital footprint occurring from Kindergarten rather than its introduction in Years 5 and 6.

• **Key terms**

Consultation feedback noted that there was further work required to make the language clear and unambiguous, to remove confusion of using different terms for the same concept and to describe how these terms are to be used.