



# Monitoring the effectiveness of the Foundation – Year 10 Australian Curriculum

Annual report

January 2018

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## 1. Executive summary

ACARA summarises stakeholder feedback on the implementation of the Australian Curriculum in a report titled *Monitoring the Effectiveness of the Foundation – Year 10 Australian Curriculum*. This report reflects an annual process of collecting and synthesising information that will inform curriculum renewal. This is the report for the 2016–17 monitoring period.

Since 2009, the staged release of the three-dimensional Australian Curriculum has brought new opportunities and challenges to all who have an interest in school education in the 21<sup>st</sup> century. In 2016, the first generation of the national curriculum for students in Foundation – Year 10 was completed with the inclusion of:

- the classical languages framework and two curricula
- the curriculum for the Australian Sign Language, a world-first dual pathway for learning that enables deaf students to develop the language they need for success at school and hearing students to learn the language of signing.

This fourth ACARA monitoring report marks a transition from a lengthy period of curriculum development to a period of curriculum stability and implementation. This time of stability is also marked by ACARA's commencement of a program of national and international research that will inform future iterations of the Australian Curriculum.

All around the world, educators and governments are refining curriculum and school programs to prepare students for post-school life and work in the 21<sup>st</sup> century. The issues for consideration in each of the curriculum learning areas and dimensions in section 7 highlight international debates regarding the need to balance the value of disciplinary knowledge with the skills, competencies and aptitudes needed for students to become creative, critical thinkers and responsible citizens who can manage rapid technological and social change.

The 2017 monitoring report contains feedback collected between 1 July 2016 and 30 June 2017. Responses were received from departmental, school and curriculum authorities in most Australian states and territories. Respondents were asked to place a particular emphasis on the implementation of the Australian Curriculum's cross-curriculum priorities and support for student diversity.

Feedback suggests broad satisfaction with the Australian Curriculum including the cross-curriculum priorities as one of the three dimensions, and the advice and resources to support the diversity of learners. However, there is also a clear indication that teachers and schools would welcome further support materials in their implementation of these elements of the curriculum.

Key issues and requests for advice from the jurisdictions arising from the 2017 monitoring process and responses are listed in the table below:

Issue/request	Response
<p>Cross-curriculum priorities:</p> <ul style="list-style-type: none"> <li>• inconsistent and uneven approaches to planning of the priorities within and across jurisdictions</li> <li>• lack of teacher confidence in skills to implement the Aboriginal and Torres Strait Islander Histories and Cultures priority</li> <li>• additional guidance and illustrations of practice to support the cross-curriculum priorities, particularly the Aboriginal and Torres Strait Islander priority</li> </ul>	<p>During the monitoring period additional resources have been published on the Australian Curriculum website.</p> <p>Illustrations of practice in Aboriginal and Torres Strait Islander Histories and Cultures were developed during the monitoring period.</p> <p>ACARA appointed a curriculum specialist, student diversity, to support stakeholders and to develop resources for publication on the Australian Curriculum website, including illustrations of practice and other advice materials.</p>
<p>Student diversity:</p> <ul style="list-style-type: none"> <li>• additional guidance and illustrations of practice to support gifted and talented students, students for whom English is an additional language or dialect, and students with disability</li> </ul>	

## 2. Background

The Shape of the Australian Curriculum paper, first approved by the council of Commonwealth and state and territory education ministers in 2009, guides the development of the Australian Curriculum. This paper reflects the position adopted by ministers collectively in their 2008 Melbourne Declaration on Educational Goals for Young Australians. The most recent version of the Shape of the Australian Curriculum v4.0 was approved by the ACARA Board in late 2012, reflecting the evolving processes used in the development of the Australian Curriculum.

The process of curriculum development involves four interrelated phases: shaping, writing, implementation, and monitoring and evaluation.

Over the past eight years, curriculum has been developed in eight learning areas for Foundation – Year 10. In 2015, the Education Council endorsed what is now version 8.3 of the Australian Curriculum, with the publication of the final learning area, Australian Curriculum: Languages, in 2016.

Since 2012, and in addition to the Foundation – Year 10 curriculum, 15 senior secondary

subjects have been endorsed as the agreed and common base for the development of, and inclusion in, the state and territory curricula, according to their own processes and timelines.

Australia's federal system of government allocates responsibility for the delivery of school education to the states and territories. Therefore, each jurisdiction's curriculum and school authorities have determined the pace and nature of the implementation of the Australian Curriculum. Decisions are made in each jurisdiction in relation to changing any existing curricula; ensuring the readiness of teachers, schools and systems; making resources and other support available and engaging constructively with ACARA.

The annual monitoring process is described in the paper noted in 2013 by the Education Council: Monitoring and Evaluation of the Australian Curriculum.

For the 2016–17 monitoring period, all states and territories were invited to provide specific feedback on the Australian Curriculum's cross-curriculum priorities and support for student diversity. With the completion of the Australian Curriculum, states and territories are now in a position to reflect on the three-dimensional nature of the Australian Curriculum. For most stakeholders, this monitoring period continues a sustained time of curriculum stability with a focus on implementation.

### 3. Methodology

The 2017 Monitoring the Effectiveness of the Foundation – Year 10 Australian Curriculum report summarises the feedback from states and territories, which reflects the monitoring period of 1 July 2016 – 30 June 2017. The main sources of feedback are curriculum and school authorities.

ACARA's Chief Executive Officer, Mr Robert Randall, wrote to key stakeholders in May 2017 inviting participation in the 2017 monitoring process. Comment was requested on any aspect of the Foundation – Year 10 Australian Curriculum, with detailed consideration of the three cross-curriculum priorities and support provided for student diversity. The following questions were posed:

- Cross-curriculum priorities
  - To what extent are the cross-curriculum priorities being used to enhance learning for students in Foundation to Year 10?
  - How useful is the material provided on the Australian Curriculum website for each of these priorities?
- Student diversity
  - Could you provide a high-level summary of student diversity in your jurisdiction/sector?
  - How is the Australian Curriculum being used to support students from a range of backgrounds and with a range of needs and interests?
  - How useful is the material provided in the Student Diversity section of the Australian Curriculum website?

Seventeen submissions were received from departmental, curriculum and school authorities. The list is provided in appendix A.

In addition to the written submissions, the Curriculum director and the Curriculum senior manager met with key personnel of curriculum authorities in New South Wales (NSW Education Standards Authority, NESAs), Victoria (Victorian Curriculum and Assessment Authority, VCAA) and Western Australia (School Curriculum and Standards Authority, SCSA) to invite discussion on jurisdictional implementation of the Australian Curriculum.

These meetings focused on three areas:

- the relationship of the Australian Curriculum to the (NSW/Victorian/Western Australian) curriculum
- future plans for integration
- any particular issues that influence or challenge local adoption of the Australian Curriculum.

All three jurisdictions indicated that the Australian Curriculum was reflected in their local curricula. Both the Victorian Curriculum and Assessment Authority (VCAA) and the School Curriculum and Standards Authority (SCSA) indicated that their curricula were true reflections of the Australian Curriculum, rather than alternative versions. The VCAA assessed their curriculum as significantly aligned with the shape, design and content of the Australian Curriculum, and SCSA referred to a refinement, or evolution of the Australian Curriculum. An outcomes-based design within a standards-referenced curriculum framework was cited as a significant conceptual distinction between the Australian Curriculum and NESAs curriculum constructs, which influenced the relationship between the two curricula.

Some key issues that influence adoption in these three states include:

- content – adding to, reducing or streamlining some content in some subjects/learning areas was reflected in all three curricula, such as more algorithmic thinking in Mathematics to support Digital Technologies, common elements across topics in History (Victoria); common set of skills in 7–10 HASS (WA); subject content combined in Design and Technologies and Digital Technologies (NSW)
- content and achievement standards – reducing the complexity of some content and achievement standards, such as in Languages subjects (Victoria and WA)
- design – reducing the variation of design among subjects within and across a learning area, such as development of strands for The Arts (Victoria), a single set of skills across Technologies and HASS subjects (WA)
- design – development of commonality of stage or year level design across all learning areas and years of schooling: year-level syllabuses (WA), stage-based syllabuses (NSW)
- conceptual design – development of content and achievement standards for the general capabilities (Victoria).

In terms of future plans for integration of the Australian Curriculum: both Victoria and Western Australia have fully integrated the Australian Curriculum, with some variations to content and structure in learning areas; New South Wales has incorporated Australian Curriculum content as syllabuses in learning areas and/or subjects are developed with some variation across learning areas (see implementation table in section 5); the WA School Curriculum and Standards Authority emphasised the time needed for jurisdictions to support implementation with teacher professional learning before any changes are made to the curriculum; and the Victorian Curriculum and Assessment Authority is commissioning literature reviews and scans of national and international research to support curriculum implementation, in parallel with ACARA's program of research, and trialling and monitoring its refinements to the capabilities to support teaching and assessment.

An overview of implementation across all states and territories is provided on pp. 8–11.

## 4. Response to previous monitoring report issues and requests

### a. Findings

The report of the 2015–16 monitoring period noted the following key findings in relation to the focus questions on the pitch, structure and validity of the achievement standards and the quality and validity of the general capabilities:

- broad satisfaction with the achievement standards
- broad satisfaction with the general capabilities
- some need for greater consistency in the achievement standards within and between learning areas
- a request for further clarity in relation to some achievement standards
- a request for some guidance in relation to the embedding of the general capabilities into teaching and learning programs.

### b. Reponses

The following responses to these findings were undertaken:

- publication of work samples to demonstrate student learning in relation to the achievement standards in
  - The Arts: Dance F–10, Drama F–10, Media Arts F–10, Music F–10, Visual Arts 7–10
  - Health and Physical Education 7–10
  - Work Studies 9–10
  - Mathematics Proficiencies
  - STEM

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- Geography 7–10
- Technologies: Design and Technologies 7–10, Digital Technology 7–10
- cross-sectoral teacher workshops to support planning in relation to the general capabilities, with a particular focus on critical and creative thinking, held at ACARA Sydney office in June 2017 with nominated participants from states and territories
- cross-sectoral and sectoral stakeholder support, on request, in relation to the achievement standards and general capabilities.



## 5. Overview of jurisdictional implementation of the Australian Curriculum (30 June 2017)

Overview – jurisdictional implementation of the Australian Curriculum F–10								
Learning area	Australian Capital Territory	New South Wales	Northern Territory	South Australia	Tasmania	Victoria	Western Australia	Queensland
English	Implemented	K–10 English syllabus incorporates AC: English content and glossary; syllabus includes additional content	Implemented	Implemented	Implemented	Implemented (includes levels prior to Foundation)	Version 8.3 implemented in 2017	Implemented
Mathematics	Implemented	K–10 Mathematics syllabus incorporates AC: Mathematics content and glossary; syllabus includes additional content	Version 7.5 and 8.3 during 2016; version 8.3 only in 2017	Implemented	Implemented	Implemented (additional content includes algorithmic thinking and sets)	Version 8.3 implemented in 2017	Implemented
Science	Implemented	7–10 Science syllabus incorporates AC: Science content and glossary; draft K–6 Science and Technology syllabus incorporates AC: Science, Digital Technologies, and Design and Technologies; syllabuses	Version 7.5 and 8.3 during 2016; version 8.3 only in 2017	Implemented	Version 8.3 implemented in 2016	Implemented	Version 8.3 implemented in 2017	Implemented

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Overview – jurisdictional implementation of the Australian Curriculum F–10								
Learning area	Australian Capital Territory	New South Wales	Northern Territory	South Australia	Tasmania	Victoria	Western Australia	Queensland
		include additional content						
Humanities and Social Sciences	Implemented	K–10 History and Geography syllabuses incorporate AC: History and Geography content and glossary; Commerce 7–10 elective course currently under review; Mathematics K–10 syllabus includes financial concepts and skills; Civics and Citizenship, and work and enterprise incorporated as learning across curriculum	Version 7.5 & 8.3 during 2016 and version 8.3 only in 2017, HASS F–6 version 8.3 only in 2016	Implemented	Government schools' implementation of version 8.3 by 2017 for primary HASS, History and Geography, Civics and Citizenship, and Economics and Business	Implemented in 2017 (incorporates the AC version 7.5)	Implemented in 2017 (combines four disciplines of HASS F–10 with single set of Humanities and Social Science skills)	Implemented
Health and Physical Education	Implemented in 2017	Draft PDHPE K–10 syllabus incorporates AC: Health and Physical Education content and glossary; syllabus includes additional content	Version 7.5 & 8.3 during 2016; version 8.3 only in 2017	Implemented	Implemented	Implemented in 2017	Implemented in 2017 (separate reporting of H and PE)	By 2020 implementation in DET and ISQ schools; 2017 implemented in Catholic schools

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Overview – jurisdictional implementation of the Australian Curriculum F–10								
Learning area	Australian Capital Territory	New South Wales	Northern Territory	South Australia	Tasmania	Victoria	Western Australia	Queensland
The Arts	Implemented	Creative Arts K–6 and 7–10 syllabuses continue to be used; revision of Creative Arts K–6 syllabus under development in 2017–18 to incorporate AC: The Arts.	Implemented	Implemented	Government schools implementing V8.3 by end of 2019 for secondary schools. Primary schools commence implementation from 2019	Implemented	Implementation in 2018	DET schools implementing version 8.3 by end of 2020; implementing in independent schools at own pace
Technologies	Implemented in 2017; reporting in 2018	Draft Technology (Mandatory) 7–8 syllabus incorporates AC: 7–8 Digital Technologies and Design and Technologies content and glossary; draft K–6 Science and Technology syllabus incorporates AC: Science, Digital Technologies and Design and Technologies; syllabuses include additional content	Version 8.3 in 2017	Implemented	Implementation v.8.3 in 2016 (Catholic for DT), government schools trialling implementing in secondary schools in 2017 and primary by 2019	Implemented in 2017	Implementation in 2018	Implemented in DET by 2020 and Catholic schools; implementing in independent schools at own pace

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Overview – jurisdictional implementation of the Australian Curriculum F–10								
Learning area	Australian Capital Territory	New South Wales	Northern Territory	South Australia	Tasmania	Victoria	Western Australia	Queensland
Languages	Implemented in 2017	Languages K–10 framework published 2016; syllabuses developed for Chinese and Japanese incorporating AC: Chinese and Japanese content	Implemented	Implemented	Government schools' implementation from 2019	Implemented in 2017	Implemented from Year 3 2018, Year 4 2019 and completed by 2023 in Year 8.	Implemented in DET by 2020 and Catholic schools; implementing in independent schools at their own pace.
General capabilities	Implemented as part of learning areas	Learning area content includes cross-curriculum priorities, general capabilities and other areas identified as important learning for all students; identified by icons	Implemented	Implemented	Government schools implemented as part of learning areas	Modified and developed achievement standards for personal and social capability, ethical understanding, intercultural understanding, critical and creative thinking	Implemented	Implemented as part of learning areas
Cross-curriculum priorities	Implemented as part of learning areas	Learning area content includes cross-curriculum priorities, general capabilities and other areas identified as important learning for all students; identified by icons	Implemented as part of learning areas	Implemented	Government schools implemented as part of learning areas	Implemented as part of learning areas	Implemented as part of learning areas	Implemented as part of learning areas

## 6. The use of the Australian Curriculum website (2016–17)

### a. Overview

The Australian Curriculum is delivered only in electronic format and ACARA continues to be mindful of the importance of monitoring the website's usability and functionality. During the monitoring period, users continued to have the option of accessing version 7.5 or version 8.3 of the Australian Curriculum. A project to redevelop the Australian Curriculum website was completed, incorporating stakeholder feedback on the site's usability and functionality from the 2015 monitoring report and user surveys. The new website, which is contemporary and flexible in design and usability, was launched in the second half of 2017. Analysis of the use of the new Australian Curriculum website will form a part of the 2017–18 monitoring report.

### b. Analysis of website usage

#### **General demographics**

For the 2016–17 monitoring period, stakeholder usage of the Australian Curriculum website was approximately 9 per cent lower than for the previous monitoring period. This is attributed to a growing familiarity with the Australian Curriculum content and the development of local versions in some jurisdictions.

The usage of version 7.5 was identical to that during the last monitoring period and represented around 15 per cent of all versions pageviews for this monitoring period. In response to stakeholder requests, version 7.5 will continue to be available until 31 December 2017. The schedule for implementation of version 8.3 of the Australian Curriculum by jurisdiction is available at pp. 8–11.

The analysis of website usage that follows is in two parts: the usage of the older version 7.5; and the most current versions during the monitoring period, that is, version 8.2 from July 2016 and version 8.3 from 14 December 2016 (following the release of the final Australian Curriculum: Languages curricula, Auslan, the Classical Languages Framework, and Latin and Classical Greek). Analysis of the current versions (versions 8.2 and 8.3), representing 85 per cent of all version pageviews for the period, is presented first.

#### **Website usage: versions 8.2 and 8.3 of the Australian Curriculum**

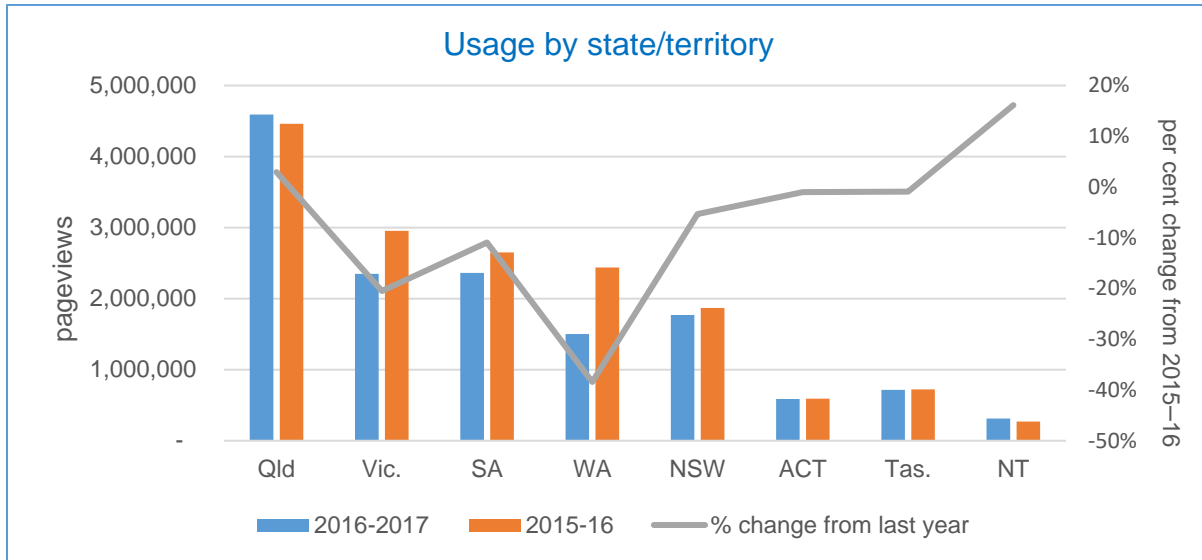
##### ***Usage by state/territory***

State and territory usage is presented in graph 1. Usage in most states and territories declined compared with the previous monitoring period, as measured by pageviews. The exceptions were the Northern Territory with an increase of 16 per cent and Queensland with 3 per cent. Usage in Western Australia continued the decline, noted in the 2015–16 monitoring period, recording a decrease of 38 per cent in 2016–17. Usage in Victoria was also down by

20 per cent. These declines may be the result of the availability of local versions of the curriculum.

As in previous monitoring periods, Queensland recorded significantly higher usage than any other state or territory.

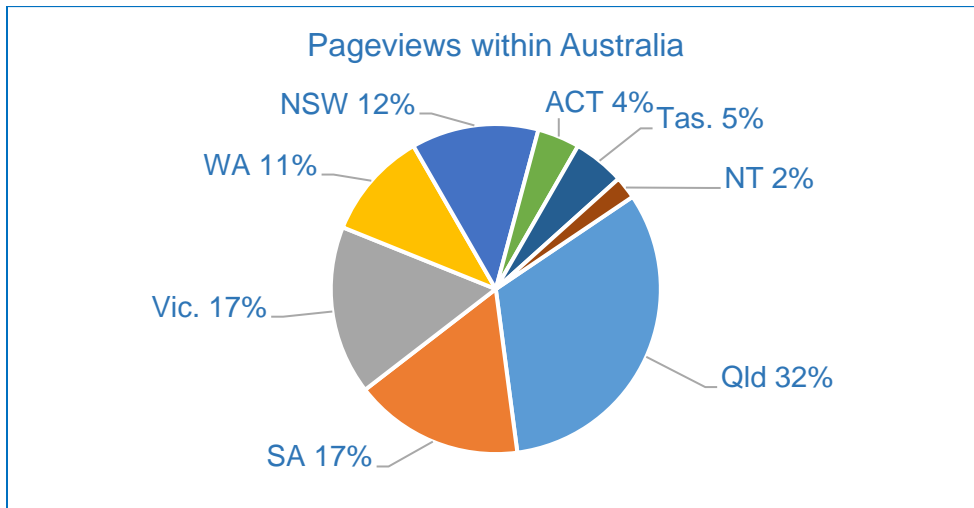
**Graph 1. Usage by state/territory**



Similar to that recorded in the 2015–16 monitoring report, the bounce rate (the percentage of visitors who enter the site and then leave without viewing additional pages) was highest for NSW users at 41.6 per cent and lowest for Tasmania at 24.9 per cent. The bounce rate was lowest for users viewing the Science pages.

Australian-based users represented the majority of visitors to the website, with 95 per cent of all traffic (down from 97 per cent last year). Of this total, the relative percentage for each state/territory is represented in graph 2.

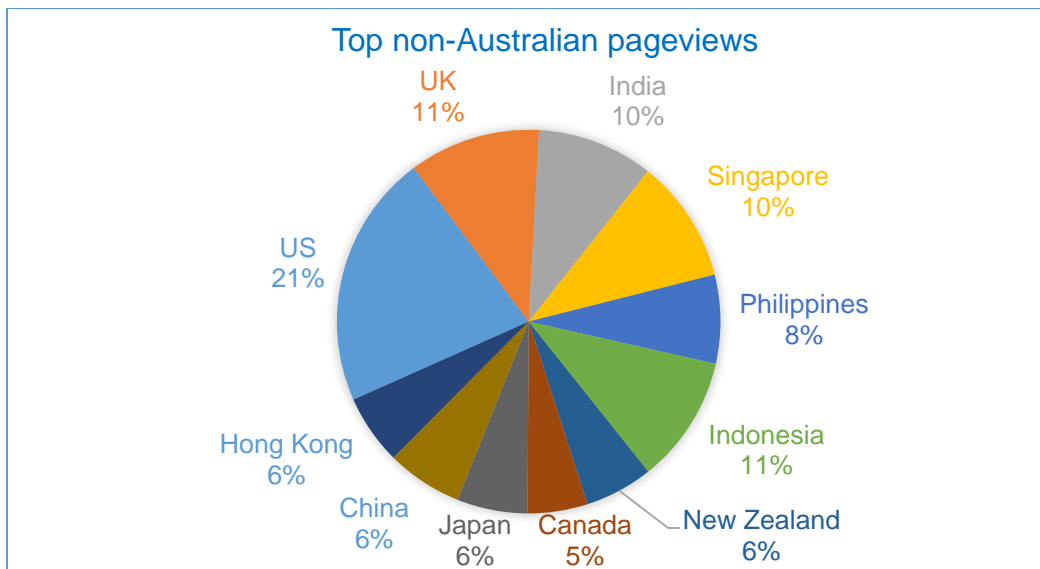
**Graph 2. Pageviews within Australia**



**Access by non-Australian users**

Pageviews by users from locations outside Australia were dominated (as was the case last year) by the United States and the United Kingdom, with increased interest as a percentage from the Asian region.

**Graph 3. Top non-Australian pageviews**



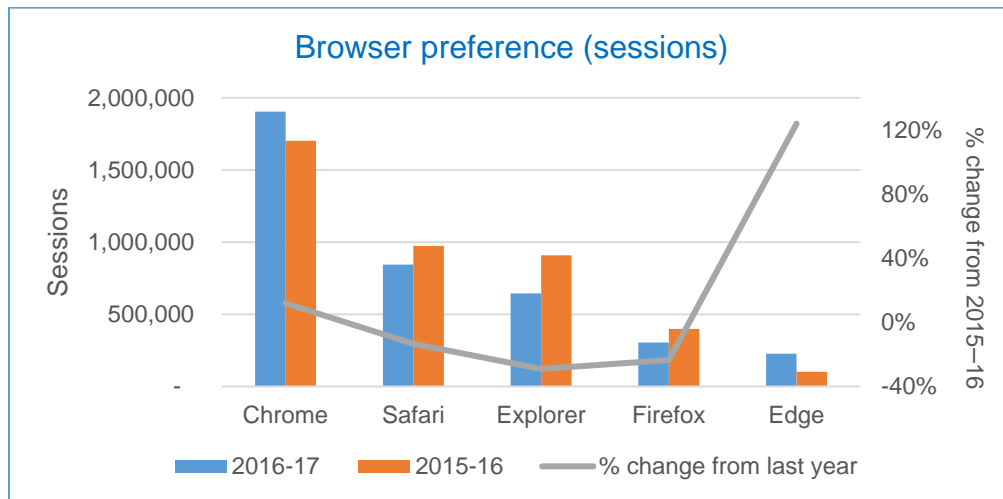
The majority of users continues to be returning visitors and this percentage is increasing. New users represented 29.7 per cent in this monitoring period (versus 30.6 per cent last year), continuing the downward trend of previous years. All states/territories recorded a reduction in new visitors with the exception of the Northern Territory, which recorded a 15 per cent increase.

### **Browser and device preference**

Browser preference amongst users has changed significantly in the last couple of years. As was noted in last year’s monitoring report, Chrome is more popular than Safari, Explorer and Firefox. The newer Microsoft Edge was also very popular, up 124 per cent with absolute numbers also continuing to rise. These trends have been noted in ensuring compatibility with the redeveloped Australian Curriculum website, which was launched in July 2017.

As sessions are a better measurement unit for browser and device use than pageviews, these data are provided in graphs 4 and 5.

**Graph 4. Browser preference**

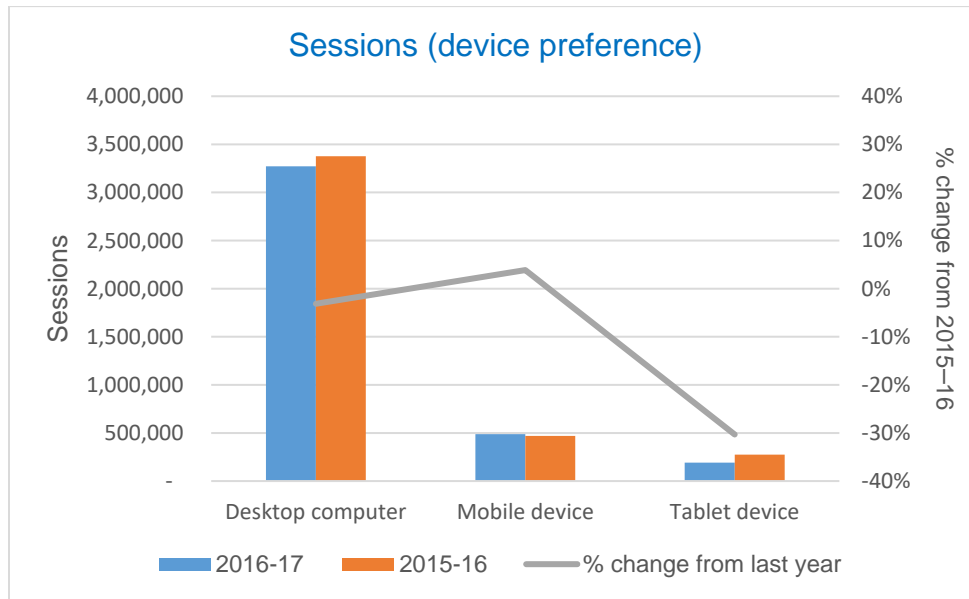


Similarly, compatibility of the redeveloped website with mobile devices has been reflected in the trend in the use of these devices. Tablet devices were used much less frequently in the 2016–17 monitoring period, as noted in graph 5.

Device use will continue to be monitored to ensure any changes or trends are considered in future website enhancements, so that accessibility is maintained across ACARA’s broad range of users.



**Graph 5. Device preference**

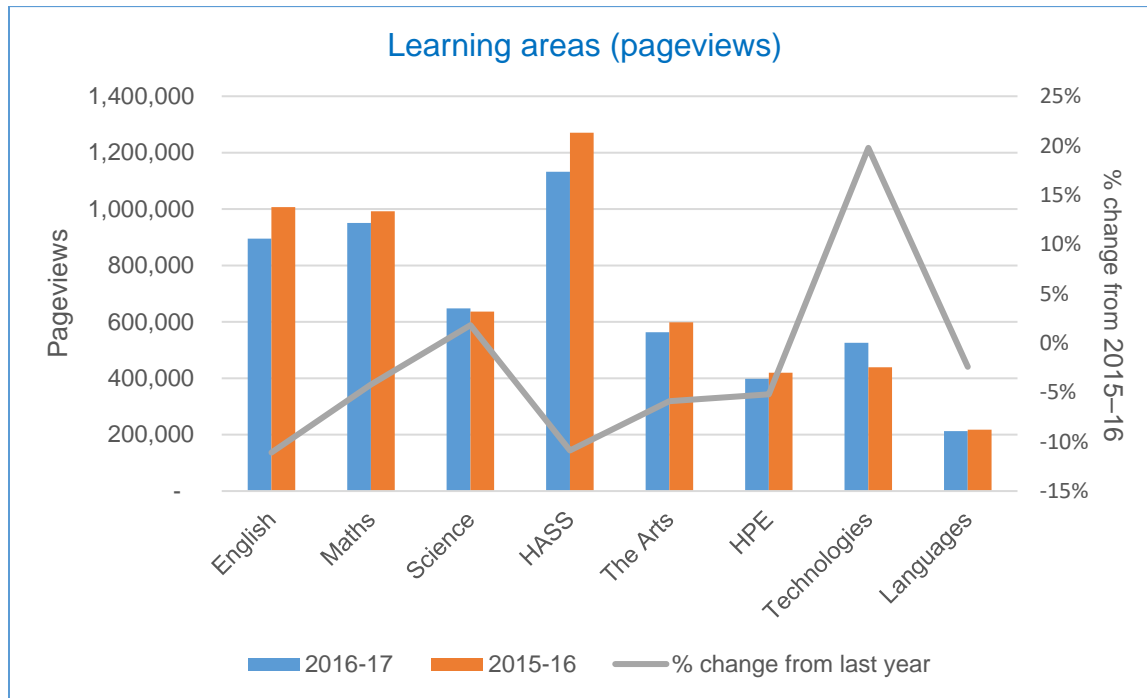


**Learning areas**

As in previous years, the Humanities and Social Sciences (HASS) learning area attracted the most interest, reflecting the breadth of its subjects. The average user of the HASS pages also viewed an average of nearly five pages per session, the highest of all the learning areas, followed by the Languages pages.

Whilst access to most learning areas was down in line with the overall decrease in access to the website, the Australian Curriculum: Technologies pages were accessed almost 20 per cent more than in 2015–16. Access to the Australian Curriculum: Science pages was also marginally higher than in the previous monitoring period, as demonstrated in graph 6.

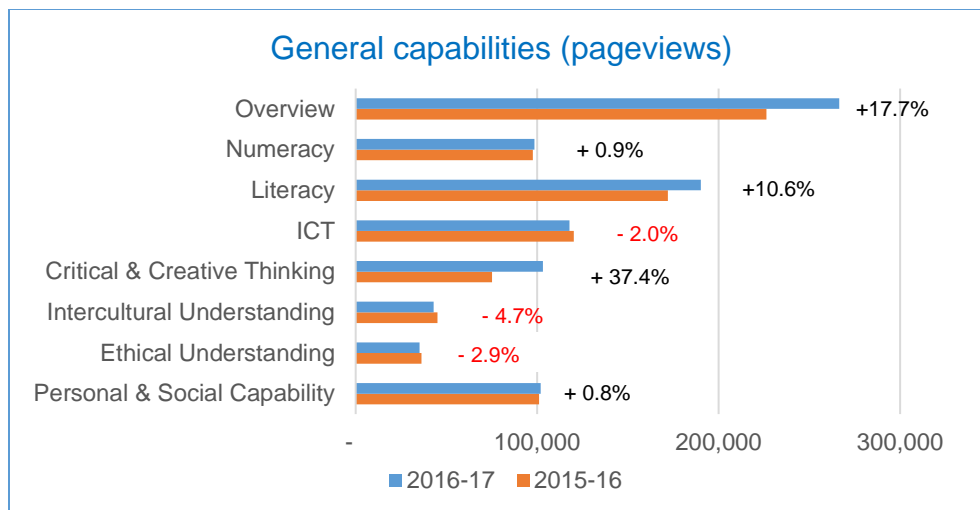
**Graph 6. Learning areas**



**General capabilities**

Against the general trend of decreased access, interest in the general capabilities strengthened in the 2016–17 monitoring period, with a 9.4 per cent increase in access to the general capabilities pages. The largest increases in usage were recorded for the Critical and Creative Thinking, Overview and Literacy pages, with these last two continuing to be the most accessed pages in the general capabilities.

**Graph 7. General capabilities**

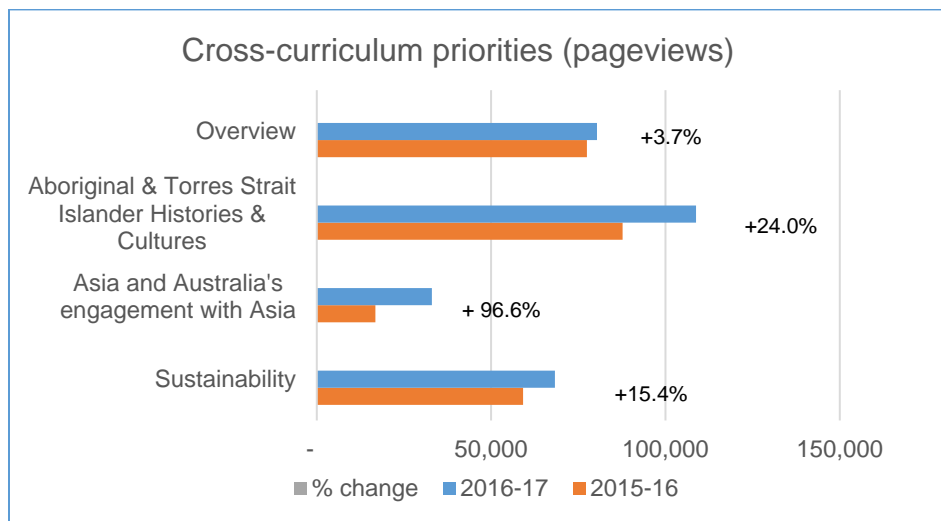


### **Cross-curriculum priorities**

Interest in the other dimensions of the Australian Curriculum continued during the 2016–17 monitoring period, with access to the cross-curriculum priorities pages recording an increase of over 20 per cent. Access to the pages for Asia and Australia’s engagement with Asia almost doubled, and access to the Aboriginal and Torres Strait Islander Histories and Cultures priority pages also increased by almost one quarter. The cross-curriculum priority of Sustainability again recorded a substantial increase, comparing with the previous monitoring period.

The Aboriginal and Torres Strait Islander Histories and Cultures pages make up over one third of the total views of the cross-curriculum priorities, similar to previous monitoring periods.

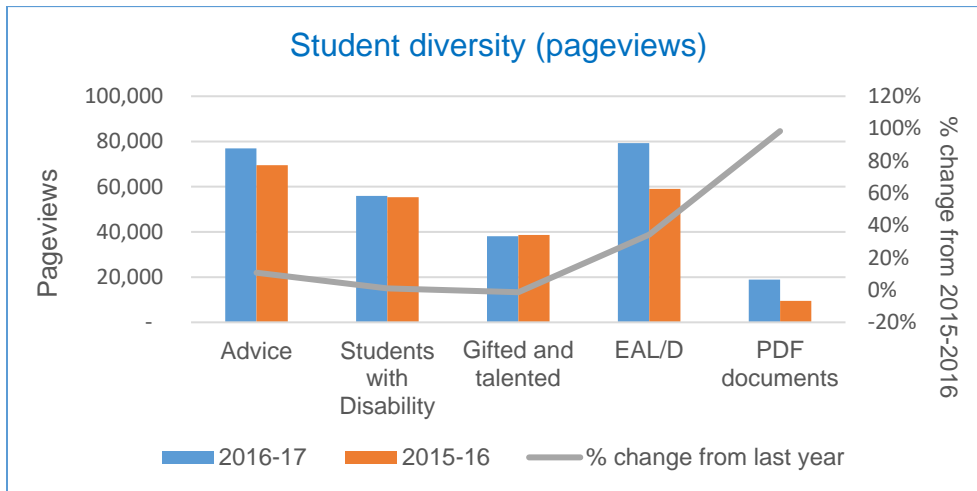
**Graph 8. Cross-curriculum priorities**



### **Student diversity**

Following the increase in access to the student diversity pages recorded in the 2015–16 monitoring period, the 2016–17 period also registered an increase of over 15 per cent. This was largely due to increases in the EAL/D (English as an additional language or dialect) and Advice pages (34 per cent and 10 per cent respectively). Access to the PDF documents nearly doubled, albeit from a small base, as reflected in graph 9.

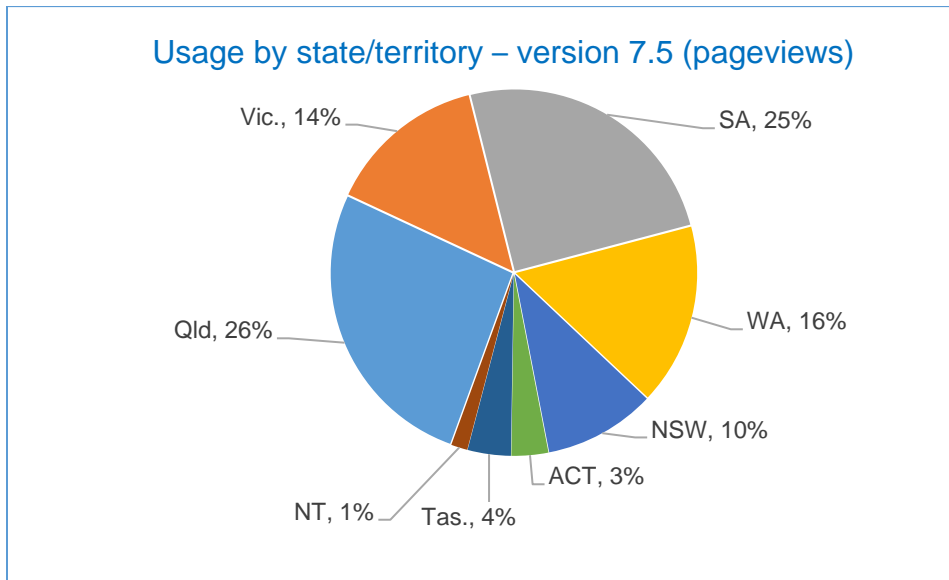
**Graph 9. Student diversity**



**Website usage – version 7.5 of the Australian Curriculum**

Version 7.5 is still being used by some jurisdictions in line with the implementation table shown on pp. 8–11. State and territory usage of version 7.5 broadly reflected the usage of the current versions of the Australian Curriculum during this monitoring period. Queensland and South Australia had the largest number of pageviews, both recording increases on the previous period, and Western Australia and Victoria had the largest decreases (at 30 per cent and 6.5 per cent respectively). Access to version 7.5 by state/territory during the 2016–17 monitoring period is shown in graph 10 below.

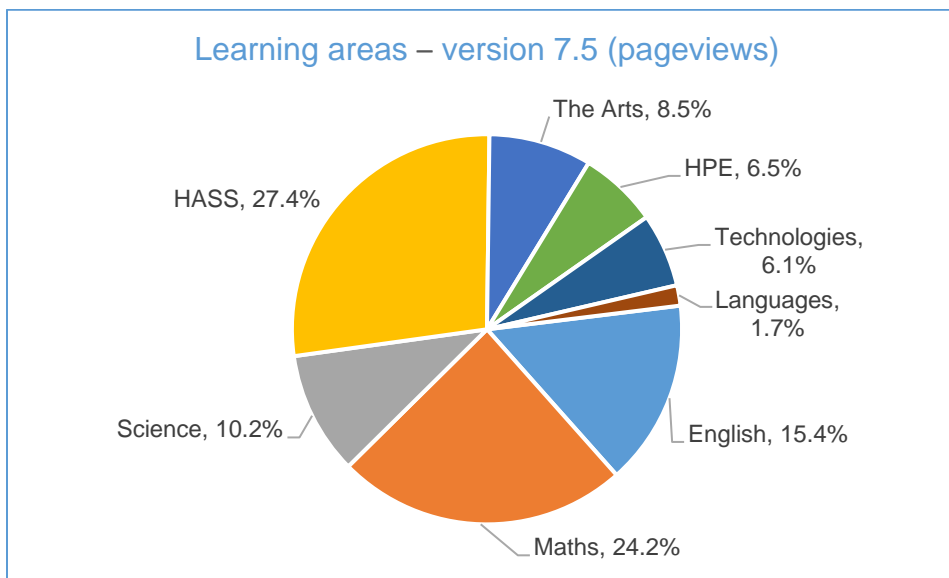
**Graph 10. Usage by state/territory – version 7.5**



Australia-based users were the majority of visitors to the version 7.5 website, representing 96 per cent of all traffic for this version. The main interest from countries other than Australia came from the Philippines (0.6 per cent of all pageviews), followed by the United States and India (0.2 per cent each).

The usage of version 7.5 by learning area is displayed in graph 11, showing that HASS again had the highest proportion of pageviews for this monitoring period.

**Graph 11. Learning areas – version 7.5 (pageviews)**



Interestingly, browser choice was slightly different for users of version 7.5: whilst Chrome was still the most popular browser, Safari recorded an increase of 15 per cent on the prior period, whereas Safari users of the current version of the website were down 13 per cent. The redeveloped website is compatible with all browsers so any shifts to or from certain browsers will not impact on users' ability to access the Australian Curriculum.

In terms of the device used to access the Australian Curriculum website, the decrease in desktop computer sessions, experienced for versions 8.2 and 8.3, was not replicated for version 7.5. There was a 20.4 per cent increase in sessions on desktops for version 7.5 and a 45 per cent increase for mobile devices. Tablet devices were used less frequently for both versions.

The average session duration and pages viewed per session were down on the previous year, suggesting either increased familiarity with this older version of the Australian Curriculum or less ongoing need for its sustained use.

## 7. Stakeholder feedback

### a. Submissions

Seventeen submissions were received from state and territory education authorities. The list is provided in appendix A.

### b. Key issues: cross-curriculum priorities

Jurisdictions reported on their development of resources and support for schools and teachers in each of the three cross-curriculum priorities. For example, the Tasmanian Department of Education reported on its Engaging with Asia Strategy and professional learning on the priority of Sustainability; the Victorian Curriculum and Assessment Authority provided links to its mapping of the curriculum and companion documents to highlight the cross-curriculum priority content; the Queensland Curriculum and Assessment Authority (QCAA) reported on the embedding of the priorities in the Department of Education and Training's Curriculum into the Classroom (C2C) units of work while also requesting additional work samples and illustrations of practice; the NSW Association of Independent Schools reported on its Aboriginal and Torres Strait Islander Conference as part of its professional development program. Some jurisdictions indicated that learning area content provided a means of exploring one or more of the three priorities, others stated that whole-school approaches to planning facilitated the incorporation of the priorities, while others indicated that implementation was at various stages of planning and development. All jurisdictions indicated that they would benefit from ACARA's publication of additional resources, support material and illustrations of practice, with the QCAA specifically requesting "resources to support teachers to develop a deeper understanding about how to plan for and deliver the cross-curriculum priorities", more explicit links between the cross-curriculum

priorities and the content descriptions, and “advice and guidelines for teachers on culturally appropriate ways to embed processes and protocols” when using artefacts and materials for Aboriginal and Torres Strait Islander Histories and Cultures.

Jurisdictional feedback largely focused on the ways that the Aboriginal and Torres Strait Islander Histories and Cultures priority was being implemented in different states and territories. The need to support teachers to confidently “handle content accurately and sensitively” (Association of Independent Schools, NSW) and embed the priority was a common theme in the jurisdictional feedback. It was suggested that professional learning specific to the priority that increased teachers’ understanding and knowledge would help to ensure teachers “do the priority justice” (Association of Independent Schools, NSW) and minimise teachers’ fear of saying something that is culturally inaccurate or inappropriate. A similar view was expressed in the submission from the Association of Independent Schools, SA, which quoted a response from its sector that:

This perceived lack of knowledge and their very real concern they will say something that is inaccurate or will offend, means teachers are nervous about engaging with this priority.

Jurisdictions reported that schools engaged in implementing Reconciliation Action Plan generally had a whole-school approach to the priority and had developed authentic partnerships with Aboriginal and Torres Strait Islander people to inform the localisation of the priority. There were also requests for further resources and support materials on the Australian Curriculum website.

Feedback indicated a concern that the three cross-curriculum priorities “are unevenly represented across the learning areas” (Department of Education, Queensland) and that there is a need to support teachers to make appropriate links across the three dimensions of the Australian Curriculum in their teaching and learning plans (Independent Schools Queensland).

### c. Key issues: student diversity

Jurisdictions reported meeting the needs of a diverse range of students using the resources of the Australian Curriculum as well as their own materials that align with the Australian Curriculum. Sector responses indicated that the Australian Curriculum student diversity advice materials are used to support their implementation of the curriculum.

Feedback included the use of the Australian Curriculum student diversity materials to support teaching and learning in various ways such as: a source for professional learning on a system level, often by consultants working with classroom teachers to differentiate their programs; using the general capabilities to support teachers to meet the needs of high and complex needs students; and by using the illustrations of practice to provide examples that suit local contexts.

Overall, respondents found the student diversity materials to be useful and practical for teachers of students with disability, gifted and talented students and EAL/D students. Information relating to students with disability is considered to be of a high quality, particularly in the overview, which

provides practical guidance that supports schools and teachers to provide accessible learning for students (Association of Independent Schools, NSW). Independent Schools Queensland indicated that the Australian Curriculum resources contain strong and clear messages about promoting equity and providing education for all students. The NSW Education Standards Authority stated that material in the student diversity section of the Australian Curriculum website provides a useful reference to the diversity of students in NSW. Queensland Catholic Education Commission considered that the terms used in the student diversity section are well defined and are succinctly explained. The Queensland Curriculum and Assessment Authority requested an evidence-based rationale for the approach described in the *Using the Australian Curriculum to meet the learning needs of all students* flowchart, the provision of further advice for parents, the facility to connect and cross-reference resources within the student diversity section of the Australian Curriculum website, and the provision of illustrations of practice for the general capabilities continua for literacy, numeracy, and personal and social capability.

The AISNSW described information provided by ACARA relating to student diversity as “very useful”, high-quality and reflective of contemporary scholarship, and of practical use to teachers. The EAL/D teacher resource was also considered to be very useful in supporting teachers to develop and implement strategies.

The Queensland Catholic Education Commission suggested that ACARA should provide more direction for teachers in the use of the literacy capability, particularly advice in the use of Level 1 with illustrative support to show how students operating at pre-Foundation level can most effectively access the curriculum. The QCAA reiterated this suggestion. Both organisations suggested that the advice provided by ACARA could be improved or strengthened by the inclusion of some illustrations of practice.

Both the Tasmanian Catholic Education Office and the Victorian Catholic Education Commission commented on the connection between assessing English proficiency of refugee students and the provision of further and revised EAL/D resources. The VCEC highlighted a need for a tool that more accurately measures English language proficiency.

Independent Schools Queensland (ISQ) presented the view that “flexible design of the Australian Curriculum will assist teachers to meet the individual learning needs of the EAL/D learner”. They supported the inclusion of students whose first language is an Aboriginal and Torres Strait Islander language, creole or related varieties and Aboriginal English in the definition of EAL/D students and stated that the *English as an Additional Language or Dialect Learning Progression: Foundation to Year 10* is used as a reference tool and resource in Queensland independent schools. ISQ requested ACARA do more work to improve resources and advice to support teachers with assessment adjustments.

The Queensland Department of Education and Training recommended that the Australian Curriculum website be revised to make the section housing support documents for EAL/D students less text heavy, more interactive and provide additional illustrations of practice.

Jurisdictions also provided a range of recommendations on improvements that could be made to the Australian Curriculum student diversity materials. These included:



- updated publications of work samples that exemplify the achievement standards in key learning areas
- further illustrations of practice, including EAL/D, and gifted and talented illustrations
- revision to the models of learning and provision of additional resources for gifted and talented students
- further guidance on the use of the general capabilities to personalise learning and to support differentiation of the curriculum
- refinement of the achievement standards to cater for students identified as gifted or talented, or with moderate to severe disabilities.

### c. Learning areas

#### **English**

The Australian Curriculum: English was endorsed by the Education Council in December 2010. By 2015 all states and territories were implementing the Australian Curriculum: English for Foundation – Year 10, with some variability across states in the approach to implementation. The senior secondary curriculum for English includes four subjects that state and territory curriculum, assessment and certification authorities integrate into the courses they offer in ways appropriate to their contexts.

The English curriculum F–10 is organised into three interrelated strands – language, literature and literacy – and may be viewed from multiple perspectives, including by year level, strand, elaboration, and through the representation of the general capabilities and cross-curriculum priorities.

Recognising that English forms the basis of learning and teaching, social and cultural interaction and interpersonal communication in Australian schools, the English F–10 curriculum expects Australian students to become proficient in Standard Australian English. Developing knowledge, skills and understandings in English is essential if young Australians are to be thoughtful members of Australian society, people who can read, view, write, design, speak, listen, contribute and make sense of the world. Supporting the curriculum are student work samples that enhance teachers' understanding of the content and the achievement standards. During the 2016–17 monitoring period, work began on further samples in F–6/7 English to enhance the current portfolio.

#### **Key points**

##### *Jurisdictional feedback*

Jurisdictional feedback in the 2016–17 monitoring period was requested in the areas of student diversity and cross-curriculum priorities. In supplying detailed responses to these two aspects of the Australian Curriculum, little direct mention was made of the English subject area. The relevant exceptions in relation to the Australian Curriculum: English were in the support for

students for whom English is an additional language or dialect (EAL/D). These statements and observations are included in the previous section (pp. 22–24).

### *Media*

National media reported widely on the results of the Program for International Student Assessment (PISA), the OECD’s international assessment of 15-year-olds students’ competencies in reading. Whilst the PISA reading assessment is not aligned to the Australian Curriculum: English, it assesses students’ proficiency in understanding, using, reflecting on, and engaging with, written texts. This aligns with the aims of the reading and viewing component of the Australian Curriculum: English.

Like NAPLAN, PISA results provide information about the approaches to reading development in Australia, but from an international context. The view of most media reports was that Australia’s ranking of 12<sup>th</sup> in reading was too low with concern that further analysis of the data indicated more than 20 per cent of Australian 15-year-olds who undertook the test had not reached the baseline level of achievement. Many media reported comments from the federal Minister for Education and Training, Senator the Hon. Simon Birmingham, who expressed his concern that increasing levels of education funding were not resulting in improved literacy results. The national performance in the writing assessment was particularly noted as the aspect of literacy that was causing the most concern (*The Australian Financial Review*, December 2016; *The Guardian*, December 2016). These articles also highlighted that the 2015 results continued a downward trend in rankings for reading, which had commenced in 2006. The Australian Broadcasting Commission’s interpretation of the test results highlighted the increase in the number/percentage of low-achieving students and the decrease in high-achieving students, and the particularly poor results in Tasmania and Northern Territory (*ABC News*, 7 December 2016).

Press-releases from the federal minister for education and training in January 2017, which indicated that Australian Year 1 students would be assessed using a national phonics screening program, resulted in media reports on the results of this type of assessment internationally and opinions from experts. Dr Jennifer Buckingham from the Centre for Independent Studies was quoted extensively, outlining the reasons this type of screening was needed and its benefits to students and teachers. Some media reported there was limited support from school principals for the screening (*The Western Australian*, April 2017), whilst others reported negative reactions such as the response from Maurie Mulheron from the NSW Teachers Federation who considered the testing as “designed to prove teachers aren’t doing the right thing” (*Newcastle Herald*, November 2016). With the strengthening of the phonics component of the Australian Curriculum: English, the performance of students on the phonics screening assessment will be of interest to ACARA and may inform future refinements to the English curriculum.

A number of other issues have been profiled in the media during this monitoring period, including issues in English and literacy that reoccurred frequently in discussion. *The Age* and *Newcastle Herald* both raised the question of the need for students to learn handwriting, following the release of Dr Noella Mackenzie’s (Charles Sturt University) research advocating the need to teach typing as well as handwriting. This issue continues to gain media attention

both nationally and internationally, with education systems grappling with the rapid increase in demand for students to access and use a range of digital tools in their everyday education.

Adopting a similar policy to Western Australian, in 2017 the NSW Government announced that from 2020, all Year 12 students in NSW must reach the minimum standard of numeracy and literacy to receive a Higher School Certificate (HSC). This meant students undertaking Year 9 in 2017 would be the first students expected to meet the minimum standard. This move, part of a suite of changes to the NSW Higher School Certificate, was widely reported in the media nationally including SBS (19 July 2016) and *The Canberra Times* (October 2016). As with any changes to high-stakes examinations, there was both support and criticism for the policy. However, the majority of reporting took the line that the literacy performance of secondary students needed to be boosted and any initiatives with this aim in mind should be supported and encouraged. Some media provided clear advice to parents and students about the new requirements, including the numbers of students in Year 9 who historically were able to reach the new benchmark (*Sydney Morning Herald*, 8 May 2017).

The proposed changes to the marking of NAPLAN writing assessments attracted significant media attention across all states and territories. The proposal to trial an online test was reported in numerous print and digital articles. There was both strong support for the trial of a digital test, as well as commentary that suggested that online testing could be problematic for both students and schools. The decision to delay the move to online testing until 2018 was widely reported, often very speculatively, with reports of 'glitches' and 'concerns' with the software platform. Media groups such as the *Sydney Morning Herald* reported that the national tests were in disarray (*Sydney Morning Herald*, 19 April 2017) and the *Herald Sun* suggested that online testing potentially disadvantaged students from less wealthy schools (*Herald Sun*, 19 April 2017).

The appearance of emojis in an item in the NAPLAN reading online practice test site prompted national media responses in March 2017. *The Courier Mail* cited the inclusion of an emoji as an example of the 'dumbing down' of English standards in the Australian education system, making a connection between Australia's performance in PISA tests and the inclusion of the emoji text on the NAPLAN practice test items (*The Courier Mail*, 31 January 2017). *The Adelaide Advertiser* questioned its inclusion based on broader problems with the overall performance of Year 9 students in literacy (*The Adelaide Advertiser*, March 2017). While some media persisted in using the emoji question as an indication that the overall NAPLAN literacy assessments were superficial or lacked rigour, recognition of the validity of such items came through media interviews with a number of literacy experts, including Dr David Caldwell from University of South Australia and Dr Jennifer Buckingham, who suggested that the focus for the media should be more upon overall literacy standards.

Reporting of NAPLAN literacy assessments and results data also included a number of themes, such as the value of the assessment and the way schools support or enable students to maximise their performance. *The Conversation* noted that NAPLAN did identify issues with students' literacy performance but also commented that the reasons NAPLAN results had 'flatlined' were complex and a single piece of evidence was not sufficient to draw conclusions about student performance (*The Conversation*, 13 December 2016). Issues that have been

raised since the inception of the test, such as the social and emotional impact of the assessment on students, continued to be reported. In an article published in *Teacher* in April 2017, Prof. Geoff Masters reviewed the results from eight years of NAPLAN testing and raised the question of how stagnating results might be improved if a more “systematic effort to identify and understand where gains are being made in our schools” was made (Masters, 2017).

### *Enquiries*

Enquiries about the Australian Curriculum: English came from jurisdictions and parents, but primarily from teachers. This followed the pattern of recent years. The enquiries covered a range of topics related to interpreting the Australian Curriculum: English, its implementation, expectations of student performance and guidance about text selection. A small number of enquiries also related to changes in the English curriculum, following the 2014 review of the Australian Curriculum, as well as the use of some of the support materials such as the *EAL/D Learning Progression*. Assessment of English in line with curriculum expectations was a subject of discussion with both teachers and representatives of state curriculum authorities.

As most teachers have now worked with the Australian Curriculum: English for a number of years, enquiries tended to be very specific, such as how a statement in the achievement standards should be interpreted or the suitability of a particular text in meeting the demands of the content. Parental enquiries were often related to student performance and the aspects of the curriculum that students should be learning at different year levels. Students undertaking research for higher degrees also made enquiries, usually relating to the development of the curriculum or accessing and interpreting key documents related to the curriculum, such as *The Shape of the Australian Curriculum*.

### *Google analytics*

During the monitoring period, the total pageviews for English on the Australian Curriculum website numbered 895,000. This was down 11 per cent from the 1.01 million pageviews of the previous year.

The greatest number of Australian Curriculum: English website users was from Queensland, followed by Victoria. There was a 32 per cent decrease in the number of Western Australian visitors this year, in line with the overall reduction in usage from that state. Northern Territory users of the English pages were up by 17 per cent, albeit from a low base.

As in previous years, the curriculum pages were most popular, with the row view for F–10 attracting the most views overall.

### *Issues for consideration*

Future design of the Australian Curriculum: English may need to consider the increasing use of English as a global language, particularly the language needs of Australian students as Australia’s engagement with Asia continues to expand. As English continues to spread as a lingua franca, it is clear that the majority of users in the coming decades may be bilingual, using English alongside one or more other languages. A corollary is the debate about the qualifications needed for teachers of English, particularly the best fit of qualifications and

experience in the selection of teachers to deliver English programs in these diverse settings. A recent survey of recruitment for English teachers indicated that at least 70 per cent of the positions were only available to native speakers of English (Kiczkowiak, 2014) and the English Language Services Professionals, with over 13,000 members worldwide, reported in 2017, that the issue of hiring only native speakers was seriously hampering the employability of many of its members, with no clear evidence that the policy was benefitting students.

While English dominates as the global language, these practices, often founded on the argument that only native speakers can accurately teach pronunciation, mean that the purpose for learning the language and the cultural context of language learning is not acknowledged for many learners (Ogura, 2014). Furthermore, different social and economic forces are driving the need to learn English in different parts of the world. Despite this, it is perceived that a universal approach to learning the language is acceptable. In South Korea, there has been a considerable increase in the number of students learning English, to the point where parents are now either choosing schools because instruction is conducted in English or sending their children overseas for schooling to ensure that they become proficient in English (Ogura, 2014). Similarly, some governments and education systems are marketing themselves based on the English language programs they offer. The Philippines describes its English programs as 'authentic' (Piller & Cho, 2013), whilst other countries, including Pakistan, are promoting English instruction in schools as the key to boosting the national economy.

## **Mathematics**

The Australian Curriculum: Mathematics Foundation – Year 10 was endorsed by the Education Council in December 2010. Mathematics is organised into three interrelated content strands: Number and Algebra, Measurement and Geometry, and Statistics and Probability; and four proficiencies: understanding, fluency, problem-solving, and reasoning. The content strands describe what is to be taught and learnt, and the proficiencies describe how content is explored or developed, that is, the thinking and doing of mathematics. By 2015, all states and territories implemented the F–10 Australian Curriculum: Mathematics.

The senior secondary Australian Curriculum: Mathematics builds on the three strands of the F–10 curriculum to provide students with a breadth of mathematical experiences. The Number and Algebra strand focuses on using the techniques of discrete mathematics to solve problems in contexts. The Measurement and Geometry strand focuses on analysing and solving a wide range of geometrical problems. The Probability and Statistics strand focuses on acquiring systematic strategies based on the investigation process for answering statistical questions. These three strands provide the mathematical knowledge and skills that form the basis of the four senior secondary subjects.

The four senior secondary subjects, Essential Mathematics, General Mathematics, Mathematical Methods and Specialist Mathematics, are differentiated, each focusing on a pathway that meets different learning needs of senior secondary students. Essential Mathematics provides students with the mathematical knowledge, skills and understanding to solve problems in real contexts for a range of workplace, personal, further learning and community settings. General Mathematics focuses on using the techniques of discrete

mathematics to solve problems in context. Mathematical Methods develops the use of calculus and statistical analysis. Specialist Mathematics provides opportunities, beyond those presented in Mathematical Methods, to develop rigorous mathematical arguments and proofs, and to use mathematical models more extensively.

In response to requests, the Australian Government Department of Education and Training commissioned ACARA to develop resources to explicate the proficiencies in the Australian Curriculum for Mathematics in Years F–10. ACARA worked with key stakeholders to develop illustrations of practice and related work samples to demonstrate how the proficiencies can be embedded in the teaching and learning of Mathematics in Years F–10. ACARA collaborated with key stakeholders to identify teachers who were using the proficiencies successfully, invited teachers to participate in workshops to develop student work samples and identified schools and teachers to participate in filming illustrations of practice. These illustrations of practice were published on the Australian Curriculum website in August 2016.

### **Key points**

#### *Jurisdictional feedback*

Jurisdictional feedback in the 2016–17 monitoring period was requested on the areas of student diversity and the cross-curriculum priorities. There was minimal formal feedback from the jurisdictions directly related to Mathematics. However, the Queensland Catholic Education Commission noted the issue of achievement standards, written in year levels, was problematic as “some teachers find it challenging to cater for students who are operating at levels above or below the expected year standard”. The Association of Independent Schools in South Australia noted the use of the Mathematics proficiencies as a way of supporting students:

In the Mathematics curriculum, educational consultants are directing teachers to focus on the proficiencies as a way to extend open questions and gather evidence of above standard learning.

#### *Media*

Over the monitoring period, there were some key issues relating to Mathematics, which were highlighted in the media. Most related to Australia’s performance in international testing, the need for a change to how students perceive the importance of mathematics in 21<sup>st</sup> century innovation, and the consequence of girls’ engagement with mathematics for their future careers.

Concerns about Australia’s performance in the Programme for International Assessment (PISA) were raised. Dr Alan Finkel, Australia’s Chief Scientist, said, “Australia is very average when it comes to Maths and Science performance – here’s what needs to change” (*The Edvocate*, December 2016), which emphasised that Australia has fallen to the 25<sup>th</sup> place in PISA rankings and that policy by education authorities needs to change to address the decline. The article ‘Australian student performance flatlining’ (Rebecca Vukovic, *Teacher Magazine*, November 2016), highlighted the concern that between one-quarter and one-third of Australian students did not achieve the Trends in International Mathematics and Science Study (TIMSS) intermediate international benchmark to apply basic mathematical and scientific knowledge in simple situations in Year 4 or apply basic mathematical and scientific knowledge in a variety of situations in Year 8.

Similarly, 'Australia stagnating in maths and science as other nations streak ahead' (Sue Thomson, *Brisbane Times*, November 2016) noted that the results of mathematics achievement of an average classroom of 25 Year 4 students and the results of students in Year 8 appear similar. The implication is that despite a further four years of schooling, the results do not really improve, with fewer students in Year 8 having a solid understanding of how to apply their mathematical skills. Another issue raised in this same article was that the gaps in achievement between Australia's Indigenous and non-Indigenous students are the same as they were 20 years ago.

The importance of mathematics for the future was emphasised in 'Schools aren't preparing kids for the jobs of the future' (Brad McDonnell, *The Huffington Post*, March 2017) and 'Digital change: can Australia keep up?' (*The Guardian*, October 2016), where reference was made to the need for the discipline of Mathematics to be targeted as a requirement for innovative and creative careers. Other articles combined the importance of mathematics for the future with the need to encourage more girls to engage with mathematics for their future careers. In 'Are schools preparing girls for the future workplace?' (Brett Henebery, *The Educator*, May 2017), Henebery noted that according to the World Bank, better educated women are healthier, have higher incomes and are happier, but preparing young women for the future workplace is an area in which Australia is lagging behind other countries. In this same article, Mark Scott (Secretary of NSW Department of Education) stated: "Mathematics has been found to be a critical filter which limits future participation and opportunity to high status and high salary fields – and it's a gendered issue". Girls often have more negative perceptions of their mathematics abilities, which may steer them away from scientific careers, particularly if they encounter challenges in their mathematics course work. This was the theme in 'I think I can't: Lack of confidence in Math keeps girls out of lucrative STEM careers' (Kristen Loschert, *Alliance for excellence in education*, April 2017). The article notes that programs that help girls build resilience, along with social support from teachers, parents and peers, can help them overcome their negative beliefs about their mathematics abilities.

Another issue identified in the media relating to the importance of mathematics to the future relates to the type of skills that students will require. The article 'How math education can catch up to the 21<sup>st</sup> century' (Mary E. Pilgrm and Thomas Dick, *The Conversation*, June 2017) identifies that in the 21<sup>st</sup> century, workers across many fields need to know how to deal effectively with data (statistical reasoning), detect trends and patterns in huge amounts of information ('big data'), use computers to solve problems (computational thinking) and make predictions about the relationships between different components of a system (mathematical modeling). The authors suggest that curriculum design should move away from the traditional view and emphasise problem-solving and understanding concepts over skills and procedures. They also assert that while memorised skills and procedures are useful, knowing the underlying meanings and understandings builds problem-solving skills to allow students to go beyond the simple to the complex.

### *Enquiries*

During the 2016–17 monitoring period, enquiries were largely limited to requests for information on using the Australian Curriculum: Mathematics and its resources, the location of specific

information on the Australian Curriculum website, the interpretation of achievement standards and some clarification of specific content descriptors. The overall decline in these types of enquiries may be attributed to the fact that, in most jurisdictions, the Australian Curriculum: Mathematics has been in effect for some years and teachers are increasingly comfortable with its use and application. There were also requests from professional associations and curriculum authorities to speak at conferences and teachers' meetings. Not all requests could be accommodated but the curriculum specialist, mathematics, did address: the Australian Association of Mathematics Teachers anniversary conference; the NSW network meeting of Mathematics Head Teachers, the Association of Independent Schools, Victoria Mathematics Teachers Conference; the NSW Department of Education Numeracy Conference; and the Association of Independent Schools, SA collegiate meetings.

### *Google analytics*

The total pageviews for versions 8.2 and 8.3 was 951,000 versus 992,000 last year – down 4 per cent. The Mathematics pages for version 7.5 recorded a small increase, which was mainly due to the number of views of the Foundation – Year 10 view by columns (year levels).

The greatest number of Mathematics pages users was from Queensland, which actually recorded an increase in views of Mathematics pages against a backdrop of a fall in many other learning areas. Victoria and South Australia users were the next most frequent, with a 28 per cent decrease in the number of visitors from Western Australia this year. This was in line with the overall reduction in usage from Western Australia.

The 'Key ideas' section of the Mathematics pages recorded an increase of 66 per cent in views compared with the previous year (albeit off a low base).

### *Issues for consideration*

Over the course of the 2016–17 monitoring period, there has been an emphasis on research addressing the tension between what students currently learn in Mathematics and what they should learn for the future. Mathematician, technologist and entrepreneur Conrad Wolfram in various TED talks (*Teaching kids real math with computers; Stop teaching calculating, start learning Maths!, What if teachers took computation out of Math class?*) highlighted there is often confusion between the rigour of procedural Mathematics, where students reiterate what they have been taught, and the rigour of having the knowledge and skills to be able to solve problems within a relevant context. Wolfram states that the challenges of solving problems allows students to develop both creativity and conceptual understanding. Conceptual mathematics is knowing more than isolated facts and methods, rather it is the development of an understanding of mathematical ideas and the ability to transfer knowledge to new situations.

Educator and writer Charles Fadel proposes that “concepts and processes should be stressed in mathematics education instead of rote procedural knowledge” (Fadel, 2014). This different view of curriculum development is being considered by various countries, such as Brazil, Canada, Chile, Finland, South Korea, Sweden, Switzerland, Tunisia and the United States, as they review their current curricula.

Mathematics curricula design often presents content knowledge as discrete groups of topics



rather than a progression of conceptual understandings. This can make it difficult for students to develop the problem-solving abilities they need for success in higher levels of mathematics, science and engineering studies. Placing more emphasis on the development of conceptual understanding at an early age will lead to better problem-solving skills later. Joseph Ganem in his research *The math paradox* argues that mathematical procedural steps can be memorised but over time the steps are forgotten as there is no conceptual understanding:

Learning techniques without understanding them does no good in preparing students for college. At the college level emphasis is on understanding, not memorisation and computational prowess. (Ganem, 2009)

There are data to indicate that students who rely on memorisation alone may be successful with the easiest mathematics problems, but may find that deeper understanding of mathematical concepts is necessary to undertake more difficult or non-routine problems. The 2016 OECD Report, *Ten questions for mathematics teachers ... and how PISA can help answer them*, states that across OECD countries, those students who persevere and have a positive attitude, are motivated or interested in problem-solving and mathematics. The PISA results on attitudes toward mathematics also indicate that students who are more confident in their mathematics abilities and who have little or no anxiety towards mathematics, are less likely to be reliant upon memorisation strategies.

The objective in the current Singapore Mathematics curriculum is to develop students' ability to apply mathematics to solve problems. This curriculum focuses on developing mathematical skills and acquiring key mathematics concepts. Teachers foster positive attitudes towards mathematics and encourage students to think about the way they learn. Teachers typically provide a real-world context to demonstrate the importance of mathematical concepts. Pedagogy provided in the Singapore curriculum involves teachers explaining the concepts necessary for the topic, demonstrating problem-solving approaches, and facilitating activities in class. Statistician and researcher Andreas Schleicher, in his paper *What Maths teachers can learn from PISA*, discusses how Singapore has approached its curriculum development to address the issue of developing conceptual understandings to enhance problem-solving and creativity. He highlights the connection between curriculum and assessment practices, where Singaporean teachers provide students with individualised feedback on their learning. Students are exposed to a wide range of problems, learn how to apply mathematics to solve them, appreciate the value of mathematics, and develop skills that can be transferred to their future learning and their ability to deal with new problems.

As the refinement of Australian Curriculum: Mathematics is undertaken, consideration may need to be given to how the curriculum is framed to promote the conceptual understandings needed to foster higher order thinking and creativity necessary for this century and the next.

## Science

The Australian Curriculum: Science Foundation – Year 10 was endorsed by the Education Council in December 2010. The Science learning area is organised as three interrelated strands, Science Understanding, Science Inquiry Skills, and Science as a Human Endeavour, which specify the science knowledge and skills that are to be taught, as well as achievement

standards at each year level. The Science Understanding strand is further subdivided into four sub-strands corresponding to the four disciplines of Biological, Chemical, Physical, and Earth and Space Sciences. By 2015 all states and territories had implemented the F–10 Australian Curriculum: Science.

The senior secondary Australian Curriculum: Science consists of the four subjects – Biology, Chemistry, Earth and Environmental Science, and Physics. The senior secondary Science subjects build on student learning developed in the Foundation – Year 10 Science curriculum and incorporate the same three interrelated strands of Science Understanding, Science Inquiry Skills, and Science as a Human Endeavour.

### **Key points**

#### *Jurisdictional feedback*

The jurisdictional feedback requested for the 2016–17 monitoring period focused on the areas of student diversity and the cross-curriculum priorities. Few responses made direct mention of the learning area of Science. The NSW Association of Independent Schools commented that teachers tend to feel most confident in embedding sustainability into students' learning experiences and would welcome more support on how best to incorporate the other cross-curriculum priorities into the Science learning area. In particular, advice and support were sought regarding the culturally appropriate handling and accuracy of information in the priority of Aboriginal and Torres Strait Islander Histories and Cultures.

Although no reference to the Australian Curriculum: Science was made explicitly, the need for more support for teachers regarding the meaningful and authentic implementation of cross-curricular priorities in the learning areas was also voiced by the Queensland Catholic Education Commission (QCEC). While teachers are cognisant and supportive of the cross-curriculum priorities, “[they] feel the priorities are being ‘forced’ to fit into some curriculum areas making it a challenge to meaningfully embed them”. QCEC suggested that ACARA could increase its support for teachers by offering more resources, work samples and illustrations of practice, and by improving the way this information is presented on the website. Responses from the Queensland Department of Education, the Queensland Curriculum and Assessment Authority, the South Australia Catholic Education Office and the South Australia Association of Independent Schools included very similar suggestions, a common one being a more consistent and comprehensive approach to linking the cross-curricular priorities and general capabilities to the content descriptors and elaborations across all learning areas.

The Tasmanian Department of Education pointed to their *Engaging with Asia Strategy* as a successful example of creating support documents for implementing cross-curricular priorities in Science and, similarly, the Queensland Department of Education and Training named their C2C materials for Year 3–4 Science as good examples of teaching units that focus on Aboriginal and Torres Strait Islander Histories and Cultures, and Sustainability.

#### *Media*

Similarly to the last monitoring period, public media interest in science education during the

2016–17 monitoring period has been dominated by Australia’s stagnating or declining performance in international comparative assessment programs, following the publication of the Trends in International Mathematics and Science Study (TIMSS) and the Programme for International Student Assessment (PISA) results (‘TIMSS 2015: A first look at Australia’s results’, *ACER*, 29 November 2016; ‘PISA 2015: A first look at Australia’s results’, *ACER*, 6 December 2016). The public debate around possible causes of this trend centred on the lack of specialist science teachers in the primary years, and to a lesser extent in secondary schools, as well as a concern around the improvements required in effective and engaging teaching practices (‘International maths and science rankings: keep calm but change direction’, *The Guardian*, 30 November 2016; ‘Three ways to boost science performance in Australian schools’, *The Conversation*, 2 December 2016). In the article ‘Science curriculum needs to do more to engage primary school students’ (*The Conversation*, 15 March 2017), the authors emphasise the importance of focusing more on values, attitudes and 21<sup>st</sup> century skills, particularly critical and creative thinking, and providing students with inquiry-based learning experiences using authentic contexts that are closely integrated with the other STEM disciplines. Other authors insist that the overemphasis on such innovative pedagogic practices is partly to blame the observed decline, alongside a perceived ‘dumbing-down’ and overcrowding of the curriculum (‘Another Fail for Education’, *The Daily Telegraph*, 8 December 2016).

Media responses following the National Assessment Program Sample – Science Literacy (NAP–SL) assessment for Year 6 students (NAP Sample Assessment Science Literacy public report 2015, *ACARA*, 15 March 2017) largely interpreted results as confirming the stagnating trend observed in the international assessments (‘Australian students fall behind in maths and science, new reports find’, *The Australian*, 15 March 2017). However, many authors have also pointed to the fact that girls performed better than boys in the NAP–SL assessment, which has generally been interpreted as a small but positive step towards closing the gender gap in senior secondary STEM participation. This was expressed by Karen Spiller, the National Chair of the Association of Heads of Independent Schools of Australia (AHISA), (‘NAP Science results and the gender gap’, *Medianet*, 15 March 2017).

Another major media topic centred upon the question of how Australian schools are preparing students for the demands of a future job market in which STEM-related skills are expected to gain increasing importance. Some media articles point out that these predicted changes to the job market are happening against the backdrop of record-low levels of student participation in senior secondary science and mathematics courses (‘Maths engagement hits record low’, *The Educator*, 20 September 2016). In his ‘Speech at the Australian Council for Educational Research Conference’ (8 August 2016), the federal Minister for Education and Training, Senator the Hon. Simon Birmingham, emphasised the importance of STEM learning – “just as sound literacy and numeracy are absolute prerequisites for success, increasingly STEM skills will become another ‘must have’” – and pledged government support for the development of STEM programs and resources as part of the continuing National Innovation and Science Agenda. In this context, many media articles reported successful examples of integrated STEM projects in primary as well as secondary schools around Australia (‘Making science learning meaningful’, *ACER Teacher Magazine*, 19 August 2016; ‘From screen to classroom and into nature – kids find fun in WilderQuest Learning’, *Education HQ*, 27 April 2017; ‘Students dive in to STEM’,

*Mercury Hobart*, 30 May 2017; ‘Chief Scientist Alan Finkel’s e-learning company Stile puts science programs into primary schools’, *The Financial Review*, 17 September 2016).

### *Enquiries*

Compared with the previous monitoring period, the number of enquiries from teachers requesting assistance with the interpretation of content descriptions and achievement standards or the location of specific information on the website has declined significantly. This may be attributed to the fact that in most jurisdictions, the Australian Curriculum: Science has been in effect for some years and teachers have become increasingly comfortable with its use and application.

Several enquiries from teachers, students and other stakeholders concerned topics that are not currently addressed in the Australian Curriculum: Science, namely the importance of meat production as a contributing emitter of greenhouse gases, the problem of antibiotic resistance, the technology of induced pluripotent stem cells (iPSC) and the details of certain DNA sequencing techniques. There were also proposals to introduce the topic of Atomic Theory much earlier in the F–10 curriculum and to include Psychology as an additional subject in the suite of senior secondary Science courses. In ACARA’s responses to those enquiries stakeholders were assured that the proposed changes and additions to the scope and sequence of the Science curriculum would be considered as part of any possible future refinement of the Australian Curriculum: Science.

A number of science teachers enquired about the discrepancy between the tagging of some content descriptions and their elaborations with particular general capabilities and requested more detailed information about elaborations that are tagged with cross-curriculum priorities.

Also during the monitoring period, a range of schools and jurisdictions were provided with support and advice regarding the Australian Curriculum: Science. Presentations and workshops were conducted for teachers in Victoria in relation to the STEM Connections Project (in collaboration with AiGroup), and for teachers in the Northern Territory on the structure of the Australian Curriculum: Science and the role of the general capabilities in the Science learning area. Advice regarding the interconnection between Science and the Aboriginal and Torres Strait Islander Histories and Cultures cross-curriculum priority was provided to a government school in Queensland as part of the illustrations of practice project. Support in the form of workshops was also provided for the development of the National Literacy and Numeracy Learning Progressions and for NAPLAN Proficiency Standards.

### *Google analytics*

The total, Science pageviews for versions 8.2 and 8.3 was 648,000 versus 636,000 last year – an increase of 1.8 per cent. This is opposite to the trend observed for the overall pageviews for the whole website, which has recorded a decrease of 9 per cent. Pageviews for Science version 7.5 were also slightly up in the previous year although overall numbers were low.

The ‘Rationale’ section recorded an increase during this monitoring period of 11 per cent compared with last year. The bounce rate for the Science pages (the percentage of visitors who enter the site and then leave without viewing additional pages) increased from last year,

suggesting that users are becoming more familiar with the website and know exactly what they are looking for. In line with this, the measurement of average number of pages per session was down marginally.

Similar to other learning areas, the majority of users for the Science pages were from Queensland. The reduction in Western Australian users for Science for this monitoring period, however, was only 20 per cent, compared with the overall decrease in usage from this state of 38 per cent.

### *Issues for consideration*

During the past two decades, one of the major trends in curriculum design has been the shift away from conceptual knowledge towards a stronger focus on skills. In the Science learning area, this development has not been limited to a heightened emphasis on discipline-specific skills, such as science inquiry skills, but has also focused strongly on the inclusion of general capabilities and competencies, such as personal and social capability, ethical and inter-cultural understandings, and critical and creative thinking, which are often subsumed under the term '21<sup>st</sup> century skills'. This development appears to be largely driven by observed and predicted shifts in labour market trends and skills shortages in the global workforce (Foundation for Young Australians, 2017), and by the perceived "inadequacies in students' preparedness to tackle 21<sup>st</sup> century challenges" (Scott, *The Futures of Learning 1*, 2015). It should be noted that not all researchers agree with the extent to which those drivers have influenced curriculum design and some criticise how "overemphasising job preparation as the primary purpose for schooling and science education and marginalising science and nature of science content" in favour of introducing more technology and engineering concepts have devalued the importance of basic science research and diminished the role of the humanities in science education (Zeidler, et al., 2016).

During the monitoring period, a considerable number of publications in science education focused on critical and creative thinking. While curriculum designers, teachers and researchers tend to agree on the importance of critical and creative thinking, not just in Science but as an essential component of 21<sup>st</sup> century education in general, issues around the exact definition of those skills (Schmaltz, Jansen, & Wenckowski, 2017), how they can be best implemented in a science classroom (Thompson, 2017), and how they can be assessed (Bermejo, Ruiz-Melero, Esparza, Ferrando, & Pons, 2016), remain at the forefront of academic research.

An increasing number of articles focus on the use of technology in curriculum design and implementation as a means to provide more authentic and engaging learning opportunities for students as well as to enhance learning outcomes. A study of Singapore's Mobilised 5E Science Curriculum (M5ESC) elucidates the design principles of such a technology-enhanced curriculum (Sun, Looi, Wu, & Xie, 2016). A good example of a novel technology and its potential for innovative approaches to teaching science is the do-it-yourself smartphone microscopy platform, 'LudusScope', which combines the educational modalities of build, play and inquire, and enables open and structured game play as well as scientific inquiry via quantitative experimentation (Kim, et al., 2016). Other researchers focus more strongly on the opportunities certain technologies provide for the development of skills and competencies that contain a

strong social domain, such as the use of online environments for collaborative problem-solving (DeWitt, Norlidah Alias, & Spector, 2017).

The integration of the learning areas of Science, Technologies, Engineering and Mathematics (STEM) remains a strong focus of international research during this monitoring period. Publications are primarily concerned with investigating national and international best practices in STEM education (Chapman & Vivian, 2017), (Rosicka, 2016) and with establishing unified approaches and conceptual frameworks that support the integration of the disciplines (Kelley & Knowles, 2016), (English, 2016). Of particular interest for curriculum design is the renewed call for stronger incorporation of computational thinking into the learning areas of Mathematics and Science (Wolfram, Smith & Titterton, 2017). Researchers argue that this would recognise mathematical modelling as a key epistemic practice in science and has a potential to not only provide more authentic learning experiences for students but also lead to deeper understanding of scientific concepts (Basu, et al., 2016), (Weintrop, et al., 2016).

## **Humanities and Social Sciences**

The Australian Curriculum: Humanities and Social Sciences learning area comprises multiple subjects. In the Foundation – Year 10 curriculum, these are: F–6/7 Humanities and Social Sciences (HASS), 7–10 History, 7–10 Geography, 7–10 Economics and Business, and 7–10 Civics and Citizenship. F–6/7 HASS comprises four sub-strands: History and Geography (each of which commence in Foundation), Civics and Citizenship (which commences in Year 3), and Economics and Business (which commences in Year 5).

The revised F–10 Australian Curriculum: Humanities and Social Sciences was endorsed by the Education Council in September 2015.

The senior secondary curriculum also comprises multiple subjects: Ancient History, Geography, and Modern History. Ancient History and Modern History were endorsed by the Education Council in December 2012; and Geography was endorsed by the Education Council in July 2013.

During the monitoring period, the Resources portal of the Australian Curriculum website was updated to include work samples for Years 7–10 Geography, which illustrate the achievement standards for each year level.

### **Key points**

#### *Jurisdictional feedback*

Jurisdictional feedback in the 2016–17 monitoring period was requested on the areas of student diversity and the cross-curriculum priorities. In supplying detailed responses to these two aspects of the Australian Curriculum, little direct mention was made of the Humanities and Social Sciences. The exceptions were a general request for an “update on the publication of examples of student work” (made by the Australian Government Department of Education and Training), and a specific request (made by the Queensland Catholic Education Commission) for the revision of the *EAL/D Annotated Content Description: History Foundation to Year 10*. This

would align the support document to reflect the Humanities and Social Sciences subject area in Foundation – Year 6/7, which came with version 8 of the Australian Curriculum.

### *Media*

Throughout the 2016–17 monitoring period, several issues in relation to Humanities and Social Sciences received recurring media attention. The most prominent was in relation to consumer and financial literacy, with a range of print articles reporting on the decline in performance of Australian students in the 2015 PISA financial literacy assessment, and also highlighting the work undertaken by ACARA in collaboration with Australian Securities and Investments Commission (ASIC) and the Australian Taxation Office (ATO) to address this trend. The issue was raised in articles such as ‘Should banks play a role in teaching kids about how to manage money effectively?’ (Carly Sawatzki and Levon Ellen Blue, *The Conversation*, 1 November 2016); ‘Government responds to adviser financial literacy concerns’ (Larissa Waterson, *Independent Financial Adviser*, 13 January 2017); ‘Generation Y believes superannuation should be taught in school a new study has revealed’ (Anthony Keane, *The Courier Mail*, 9 February 2017); ‘Most Australians leave school with little or no education on superannuation or how to save: It’ll be costly if this doesn’t change’ (Caleb Bond, *Perth Now*, 13 February 2017); ‘ACARA unveils financial literacy resource for schools’ (Robert Ballantyne, *The Educator*, 10 February 2017); ‘ATO adds value to developing financial literacy’ (*Invest in Australia*, 5 March 2017); ‘ASIC launches new teaching resource to build the financial capability of Indigenous students’ (*Australian Securities and Investments Commission*, 16 March 2017); ‘OECD report warns Australian teenagers falling behind in financial literacy’ (Monique Hore, *The Herald Sun*, 25 May 2017); and ‘Why is Australian 15-year-olds’ financial literacy declining?’ (Carly Sawatzki, *The Conversation*, 26 May 2017).

The argument and evidence in many of these articles focused upon the perceived need for Australian students to be better equipped with the skills and knowledge associated with consumer and financial literacy. Repeated mention was made of the complexity of superannuation systems, the implications for individuals in the short and long term, and the different levels of achievement of Indigenous and non-Indigenous students. Concurrently, there was reporting of the joint initiatives undertaken by ACARA, ASIC and the ATO in supporting teachers and students in each of these areas. There was detailed coverage of the resources – including units of work and interactive activities for all year levels – that have been made available for consumer and financial literacy via ACARA’s Curriculum Connections resource portal.

Other recurring topics comprised inclusion of Aboriginal and Torres Strait Islander peoples, ways of fostering Australia’s relationship with Asia, and notions of Australian identity and citizenship. Discussion of these issues was evidenced in ‘Curriculum needs to refocus on our history, says Huggins’ (*National Indigenous Times*, 3 November 2016); ‘How to talk to kids about racism’ (Naomi Priest, *The Conversation*, 22 November 2016); ‘Australians have too much in common to divide over a treaty’ (Gary Johns, *On Line Opinion*, 15 December 2016); ‘Tasmania adds ‘missing chapter’ to constitution, officially recognising Indigenous owners’ (Harriet Aird, *Radio Australia*, 15 December 2016); ‘What students learn about Asia is outdated and needs to change’ (Fazal Rizvi, *The Conversation*, 8 February 2017); ‘Treaty with Aboriginal

people could bring change in school curriculum’ (Calla Wahlquist, *The Guardian*, 25 February 2017); ‘The best way to understand Indigenous people of Australia is by reading their stories’ (Ambelin Kwaymullina and Amy Chien-Yu Wang, *SBS Online*, 19 March 2017); and ‘Into the heart of Tasmania: Gaining a sense of Aboriginal culture’ (Lyndon Ormond-Parker, *The Advertiser*, 13 May 2017).

These articles and discussions all explored in some way the importance of intercultural understanding and ways in which the school curriculum, in both the primary and secondary years, can contribute to the creation and strengthening of Australian values and identity. ACARA’s work in the Aboriginal and Torres Strait Islander illustrations of practice project and the provision of a more comprehensive range of student work samples in the HASS subject area, although not undertaken in direct response to any individual article or concern during this monitoring period, are indications of ACARA’s ongoing awareness of the importance of these issues in Australia’s educational landscape.

### *Enquiries*

During the 2016–17 monitoring period, responses and support in relation to the Humanities and Social Sciences were provided to a range of individuals and educational organisations from Australia and overseas. The majority of Australian enquires were associated with either the navigation of the F–6/7 Humanities and Social Sciences section of the Australian Curriculum website – often seeking clarification of the requirements of each sub-strand – or the implementation of strands or sub-strands of the HASS curriculum at a state or territory jurisdictional level. Overseas enquires predominantly related to research into civics and citizenship education.

Also during the monitoring period, a range of schools and jurisdictions were provided with support and advice regarding the Australian Curriculum: HASS. Workshops and presentations were conducted in government and independent schools in Victoria, Queensland, South Australia, New South Wales and Western Australia as part of the collation of representative work samples, which illustrate the HASS achievement standards. Advice regarding the interconnection between HASS and the Aboriginal and Torres Strait Islander Histories and Cultures cross-curriculum priority was provided to a government school in Tasmania as part of the illustrations of practice project.

### *Google analytics*

During the monitoring period, the total number of pageviews for sections of the Australian Curriculum website relating to the Humanities and Social Sciences was 1.13 million. This was down 10.9 per cent on the 1.27 million pageviews in the previous monitoring period. During the same period, the views of the HASS pages in version 7.5 of the Australian Curriculum were also down 8.6 per cent.

The greatest number of HASS website users were from Queensland, followed by South Australia, with a 30 per cent decrease in the number of Western Australian visitors. This is in line with the overall reduction from WA. The curriculum pages of the collective HASS subjects were most popular, with the F–6/7 HASS curriculum, in particular, attracting over 400,000 views



compared with almost 270,000 last year.

### *Issues for consideration*

Throughout the monitoring period, international consideration has been given to the role and importance of humanities education. The OECD Future of Education and Skills: Education 2030 project and the International Bureau of Education – UNESCO Global Curriculum Network project, Future Competencies and the Future of Curriculum: A Global Reference for Curricula Reforms for the Fourth Industrial Revolution have continued to explore the ways in which curriculum design can respond to changing societal demands. These initiatives operate within a context that has been associated with the military acronym VUCA: a world which is volatile, uncertain, complex and ambiguous (Tonurist & Cook, 2017).

The concurrent shift in educational emphasis towards strategies associated with STEM – Science, Technology, Engineering and Mathematics – has resulted in a potential tension between the creation of educational experiences and curricula, which are utilitarian or economically-driven and those which are perceived to be founded in the ‘soft’ skills of the humanities. The overseas trend, as reported by researchers such as Martha C. Nussbaum in ‘Not for Profit: Why Democracy Needs the Humanities’ and Fareed Zakaria in ‘In Defence of a Liberal Education’, has seen a decline in post-compulsory school enrolments in humanities subjects and a rise in engagement with STEM-related courses (Nussbaum, 2016) and (Zakaria, 2016).

However, the 2014 Mapping the Humanities, Arts and Social Sciences in Australia (a joint initiative of the Australian Department of Industry, the Office of the Chief Scientist, the Australian Academy of the Humanities, and the Academy of the Social Sciences in Australia) indicated that this trend does not appear to be currently replicated in Australia. Instead, this report emphasises the vital interrelationship between STEM and HASS, an emphasis that has been echoed in other countries during the monitoring period (Marks, 2015). This argument has been presented by ‘Engineers Need the Liberal Arts Too’ (Kenneth Osgood, *The Chronicle of Higher Education*, 21 May 2017), ‘The role of the arts, humanities and social sciences in forming and informing responses to contemporary social change’ (Kevin Albertson et al., *The International Journal of Interdisciplinary Civic and Political Studies*, 2016), and ‘STEM education: a deficit framework for the twenty first century? A sociocultural socioeconomic response’ (Dana Zeidler, *Culture Studies of Science Education*, March 2016) among others.

The challenge to the Humanities and Social Sciences – and its role as a learning area in the Australian Curriculum – therefore lies in providing young Australians with the knowledge and skills to succeed within this evolving national and international environment. Critical thinking, problem-solving, analysing, collaborating and communicating are not only the foundational skills throughout the Humanities and Social Sciences – which can be further leveraged through the general capabilities within the Australian Curriculum – they are also the skills that are currently informing international explorations in curriculum development and redesign.

## **The Arts**

The Australian Curriculum: The Arts was endorsed by the Education Council in September

2015. It consists of Dance, Drama, Media Arts, Music, and Visual Arts. These subjects organise learning and teaching through two interrelated strands – making and responding – engaging students as art makers through arts practices and critical and creative thinking that reflect each subject's distinct requirements in terms of knowledge and skills.

During the monitoring period, the Resources portal of the Australian Curriculum website was updated to include work samples for Foundation – Year 6 in Dance, Drama, Music and Media Arts, and Years 7–10 Dance, Drama, Media Arts, Music and Visual Arts, which illustrate the achievement standards for each band of years.

## **Key points**

### *Jurisdictional feedback*

Jurisdictional feedback in the 2016–17 monitoring period was requested in the areas of student diversity and cross-curriculum priorities. In supplying detailed responses to these two aspects of the Australian Curriculum, there was no specific mention of the Australian Curriculum: The Arts from jurisdictions. However, the Australian Curriculum: The Arts, alongside other learning areas, offers and delivers significant opportunities in both managing and supporting student diversity and the cross-curriculum priorities.

### *Media*

Media over the 2016–17 monitoring period has been consistent with that of the last two years. Coverage continues to support the case for valuing arts education in general terms to offer diverse pedagogical, social, and economic benefit to students and the community. This advocacy theme was raised in articles such as 'Why pushing creativity out of classrooms will stop children succeeding in the 21<sup>st</sup> century' (Newing and Saunders, *The Guardian*, 19 November 2016); 'The focus on maths and science doesn't add up. Arts must be in the equation' (Brewin, *The Guardian*, 12 December 2016); 'Arts-based approach to teaching literacy: stop all the testing and do this' (David & Saunders, *Australia Association for Research in Education*, 7 August 2017); 'Art essential in early learning, expert says, as Queensland kids channel Van Gogh' (Peterson, *Radio Australia*, 19 July 2017); 'Art teachers still searching for a fairy tale ending' (Curtis, *Education HQ Australia*, 26 January 2017).

There continued to be a focus on digital technologies and the responsibility of schools, and by default, curriculum, to embed digital learning and literacy into creative and all other subject areas. Interestingly, this year media focus declined in relation to STEAM, although several items of interest emerged from arts educators arguing that there was an oversupply of graduates with STEM degrees compared with degrees for the jobs available in the market (*The Australian*, February 2017). These articles suggested that innovative career services and earlier student alignment to future economic imperatives are required of students, rather than stronger STEM initiatives. An online article summarised positive outcomes experienced in schools implementing STEM projects ('What will it take to get our students job-ready – STEM or STEAM?', Pearson Australia Group, 2017). In all cases, student engagement and learning were enhanced with the inclusion of the arts in STEM projects.

### *Enquiries*

Enquiries were received from teachers and curriculum managers across the country. On the whole, teachers sought explanation on highly specific aspects of content and work samples. There were no shared or common themes to the teacher enquiries. Other personnel, including curriculum managers from jurisdictions and sectors, made contact regarding clarification of terminology, such as ‘sub-strands’. Those enquiries, which were implementation-related matters, were referred to the appropriate authority or jurisdiction for follow-up.

### *Google analytics*

During the monitoring period 1 July 2016 – 30 June 2017, there was an overall decrease in page visitation, with the total The Arts pageviews being 563,000 versus 599,000 last year – a decrease of 6 per cent. This reflects the overall decrease of 9 per cent in pageviews for the ACARA website over the previous year.

As in the previous monitoring period, Visual Arts were the most visited pages amongst The Arts, representing about a third of the pageviews, followed by Music with around 20 per cent. Media Arts pages were the only pages to experience an increase in usage during the 2016–17 monitoring period, up almost 3 per cent, and the landing page for The Arts was the most visited page overall.

NSW, Queensland, Tasmania, ACT and the Northern Territory all recorded an increase in usage in this monitoring period.

### *Issues for consideration*

During the 2016–17 monitoring period, the national and international educational and curriculum community continued to mount and maintain a case for the value and relevance of arts education in the face of STEM-related curriculum pressure. Subject-relevant academic and government agencies continue to investigate and advocate for the benefits of an arts-enriched STEM curriculum (STEAM). The National Advocates for Arts Education (NAAE) in their submission to the *Inquiry into innovation and creativity: workforce for the new economy* set out the various benefits of an authentic arts education (NAAE, 2017). Specifically, many 21<sup>st</sup> century capabilities are supported and enhanced through arts education and this was made explicit in their submission. The arts community ardently support the immense capacity for an arts education to explicitly and implicitly develop creative and innovative transferrable capabilities. Professor Michael Anderson, the University of Sydney, spoke to this matter in his keynote at the Australian Curriculum Studies Association Conference in Sydney in October 2016: ‘Creativity as the innovation literacy’.

The STEM phenomenon places pressure on other aspects of the curriculum. Arts, alongside other ‘core’ learning areas, are under increasing pressure to justify their relevance and ability to prepare young people for their future. The 2015 text, ‘How arts education makes a difference: Research examining successful classroom practice and pedagogy’, collates a convincing set of examples of how arts education, including technology-rich subjects such as media arts, makes a difference in the learning of young people (Fleming, Gibson, & Anderson, 2015). These national and international examples promoted arts education as transcending cultural

differences and highlighted their capacity to motivate and engage students across all learning activities. Creativity is not the sole domain of the creative arts, but this research argues that an arts education fosters particular learning habits and approaches that enhance collaborative and integrated learning.

Additional STEAM examples were provided by Taylor in ‘Why is a STEAM curriculum perspective crucial to the 21<sup>st</sup> century?’ Taylor argues that the long-term, higher-order thinking demands that are gained through an arts-rich curriculum are essential for young people to innovate in other subject areas. He provides seven key summary points advocating on behalf of STEAM education, which promote inter-disciplinary, transformative and engaging teaching and learning (Taylor, 2016).

The subject-specific and more generic interests of the Australian Curriculum: The Arts are well-represented by professional organisations across Australia. In the face of the STEM emphasis, these groups will continue to collate appropriate international and national research, which highlights the significance and benefits of an arts curriculum that enhances opportunities for inter-disciplinary, humanistic, cross-cultural competencies, well-suited in supporting the general capabilities of the Australian Curriculum.

## **Health and Physical Education**

The Australian Curriculum: Health and Physical Education for Foundation – Year 10 was endorsed in September 2015.

During the 2016–17 monitoring period, ACARA developed resources to support teachers engage with, understand, and manage this curriculum. These resources include student work samples (published in August 2016), which illustrate the achievement standards and support teachers to make judgements about student achievement in Health and Physical Education. In addition, two Curriculum connections – Outdoor learning, and Food and wellbeing (published in February 2017) – demonstrate how the Australian Curriculum can be delivered in different contexts. Teachers can link learning from the Health and Physical Education curriculum to other learning area content as well as the general capabilities and cross-curriculum priorities.

### ***Key points***

#### ***Jurisdictional feedback***

Jurisdictional feedback in the 2016–17 monitoring period was requested in the areas of student diversity and cross-curriculum priorities. In supplying detailed responses to these two aspects of the Australian Curriculum, little direct mention was made of Health and Physical Education. However, stakeholders and classroom have provided a number of considered responses to the Australian Curriculum: Health and Physical Education and resources throughout the monitoring period.

Jurisdictions, stakeholders and classroom teachers received the Australian Curriculum Connections resources positively. In response to the launch of the Curriculum Connections resource for Outdoor learning, Associate Professor Tonia Gray, Senior Researcher at the

Centre for Educational Research at Western Sydney University, wrote:

ACARA has pieced together an exceptional resource which will advance our outdoor profession immeasurably. Teachers have been provided with a suite of e-resources to incorporate outdoor learning into their classrooms. (Email received February 2017.)

Jurisdictions are seeking a consistent approach to the use of achievement standards across bands comprising two or more year levels, such as those in Health and Physical Education. Additionally, there continue to be requests for guidance in relation to assessment, working with composite classes and incorporating teaching and assessment of the general capabilities within Health and Physical Education. For example, discussions with Curriculum Services, Tasmania, related to reporting on the Health and Physical Education achievement standards in primary schools and ways of supporting schools and teachers to manage this process effectively.

Brisbane Catholic Education Office has worked with teachers to ensure they were not 'splitting' the achievement standard into two paragraphs (the first as 'health' and the second as 'physical education'). There have also been productive discussions between classroom teachers and physical education specialists to ensure efficient and effective coverage of the Health and Physical Education curriculum in primary schools based on advice from ACARA.

Catholic Education South Australia (CESA) and the SA Department for Education and Child Development (DECD) have worked in partnership with ACARA to support schools to teach and assess general capabilities, child safety curriculum content and learning area content in explicit and connected ways. Feedback from the CESA, DECD and the schools involved has been positive:

My intended action is to use the general capabilities and the achievement standards more effectively as the forefront of my planning across all areas of the curriculum, not just CPC (Teacher reflection, July 2017).

The National Health and Physical Education Curriculum Leaders Forum, held in Brisbane in March 2017, acknowledged the importance of this annual face-to-face forum in gaining a 'big picture understanding' across Australia for all members on all Health and Physical Education topics (forum minutes, April 2017). Issues discussed this year included: exploration of the strengths-based approach proposition; ACARA and West Australian work samples; sexuality education and policy across states and territories; building consensus for an agreed-to set of principles for both health and physical education; implications of the 2016 Active Healthy Kids Australia (AHKA) Report Card considering the Health and Physical Education propositions of valuing movement and educative purpose; and data collection in schools. The five propositions that underpin the Australian Curriculum: Health and Physical Education curriculum continue to be an important and useful platform for discussions that support the pedagogical approaches necessary to deliver the content of the Australian Curriculum: Health and Physical Education.

Comments by jurisdictional representatives at the Health and Physical Education Curriculum Leaders Forum regarding adopting or adapting the Australian Curriculum: Health and Physical Education indicated that whilst there were differences in approaches, more than 90 per cent of the prescribed curriculum is being addressed, including in states that are implementing local variations (Alison Turner, *ACHPER Advocate*, April 2017).

## Media

During the 2016–17 monitoring period, more than 300 articles appeared in the media on a range of topics related to aspects of the Health and Physical Education curriculum. Public discourse included references to the ways in which the Australian Curriculum: Health and Physical Education addresses sexuality, domestic violence, respectful relationships, physical activity and academic achievement, outdoor play, swimming, food and nutrition, sport, cyber safety, sexting, pornography, mindfulness, mental health, drug use, road safety and social/emotional learning.

Approximately 40 per cent of the articles was related to the Health and Physical Education focus area of relationships and sexuality: gender diversity, respectful relationships, domestic violence, sexuality education, cyber safety, sexting and pornography. Rather than forcing an agenda on schools (*Daily Telegraph*, July 2016), there was a strong emphasis on the need to work with parents to expand students' world views (*New Matilda*, August 2016; *The Canberra Times*, December 2016; *ACER Teacher*, April 2017) and create school environments that support the wellbeing of all students (*Collie Mail*, July 2016; *The Australian*, July 2016; *The West*, July 2016; *NT News*, November 2016, *The Guardian*, December 2016). This emphasis reflects ACARA's advice to schools about how consistent messages across the school and wider school community validate and reinforce Health and Physical Education learning (*Herald Sun*, *Courier Mail*, *The Advertiser*, February 2017). SBS reported on Californian schools introducing LGBTI history into the curriculum (July 2016).

Learning about respectful relationships is part of the Australian Curriculum: Health and Physical Education content descriptions and using a critical enquiry approach in health and physical education is an underpinning proposition. The issue of family violence and the role of the curriculum featured in the media over this reporting period. Despite concerns about issues such as 'male privilege' (*The Australian*, October 2016, March 2017, April 2017; *Herald Sun*, October 2016, April 2017), school curriculum was seen to play an early intervention role in preventing domestic violence (*Herald Sun*, October 2016; *3AW News Talk*, October 2016; *NT News*, October 2016; *Tweed Daily News*, October 2016; *The West Australian*, May 2017; *SMH*, June 2017). Evidence was presented that people who rigidly adhered to stereotypical gender roles were more likely to support or condone violence against women (*The Conversation*, October 2016; *WA Today*, February 2017).

The issues of safety and wellbeing of children and young people were raised in several articles relating to sexting, smartphones and access to pornography at ages as young as eight (*ACER*, August 2016; *The Advertiser*, September 2016; *Courier Mail*, October 2016; *The West Australian*, October 2016, November 2016; *The Conversation*, December 2016; *Herald Sun*, February 2017; *Tweed Daily*, February 2017; *Huffington Post*, March 2017; *Sunday Mail*, April 2017; *Mamamia*, April 2017, May 2017; *Central Coast Express Advocate*, April 2017). Accurate, age-appropriate sexuality and safety education was seen as vital in preparing children and young people to deal with the increasing access to this information (*New York Times*, November 2016; *The West Australian*, November 2016; *Courier Mail*, December 2016; *The Advertiser*, December 2016; *Cootamundra Herald*, March 2017).

Mental health-related issues were another focus of media attention, including articles about

mediation, mindfulness, mental illness, drugs, social and emotional skills, bullying and harassment and suicide and their relationship to the Australian Curriculum: Health and Physical Education. Wellness and skills such as resilience were written about as 21<sup>st</sup> century skills (*The Guardian*, February 2017; *ACER*, May 2015). Emotional wellness was also linked to effective learning (*WA Today*, August 2016; *Courier Mail*, December 2016; *Daily Telegraph*, March 2017) and there was a call for stress management and depression prevention to be embedded in the curriculum (*Education HQ*, April 2017; *Herald Sun*, August 2016). The realities of youth suicide and the need for students to learn health literacy skills and develop the skills to critically evaluate health claims as well as the confidence to seek help were also topics in the media (*The Conversation*, April 2017; *AJP online*, May 2017).

Based on research about improvements in children's sleep and concentration, there is a recurring move by some health experts to have mindfulness explicitly included in the Australian Curriculum (*The Examiner*, October 2016; *Business Frist Magazine*, February 2017; *ABC Riverland*, March 2017). Currently, the flexibility of the Australian Curriculum: Health and Physical Education allows for mindfulness to be taught through the focus areas of lifelong physical activity or mental health and research demonstrates the potential positive impact on young people (Kuyken, et al., 2013).

The Australian Curriculum: Health and Physical Education aims to teach students movement skills they need to participate in a variety of physical activities. Media articles and reports also included discussion about the evidence base, value and role of physical education, physical activity, sport and outdoor learning in improving academic achievement and engagement in learning (*ABC Canberra*, November 2016; *Education HQ*, November 2016; *Sydney Morning Herald*, January 2017; *The Conversation*, January 2017; *tes*, April 2017; *Brisbane Times*, May 2017). Despite this research, some parents perceive physical education as being given less time in schools than it warrants (*The Queanbeyan Age*, May 2017). Psychologists and peak education bodies agreed on the need for regular opportunities for students to move in developmentally appropriate ways and for physical education to be at the forefront of every child's schooling (*ABC Canberra*, December 2016; *The Advocate*, December 2016; *Education HQ*, March 2017; *ABC News*, March 2017; *Australian Leisure Management*, March 2017; *Kids in the City*, March 2017). There was also a discussion about moving the focus in schools away from sport and on to encouraging healthy fitness habits (*Herald Sun*, May 2017).

As a result of findings and recommendations from the Premier of Victoria, the Victorian Education Minister and the Coroner of Victoria, the Victorian Curriculum and Assessment Authority mandated a minimum standard that all students be able to swim 50 metres and demonstrate survival skills by the end of Year 6 from the beginning of the 2017 school year. National media featured calls to replicate this requirement across the other states and territories (*The Guardian*, December 2016; *Radio 4KQ*, January 2017; *Daily Liberal*, January 2017; *Southern Courier*, February 2017). The Australian Curriculum: Health and Physical Education includes content descriptions in relation to safety in and around aquatic environments as required learning for all Australian students. This content has been written in a way that acknowledges the issues many schools face in relation to access to aquatic facilities and specialist equipment, and the costs associated with the use of facilities and obtaining qualifications.

Obesity, food and nutrition, and healthy eating in schools were other topics of media comment. There was acknowledgement that the obesity issue is complex and that the Australian Curriculum: Health and Physical Education equips children to make healthy food and drink choices (*NT News*, October 2016; *Daily Telegraph*, March 2017). Research has also been released about the link between diet and academic achievement (Burrows, Goldman, Olson, Byrne, & Coventry, 2017).

Fitness testing on a national scale was raised in a NSW report and subsequently discussed in a variety of media nationally and internationally (ABC News, October 2016; *The Spectator*, October 2016; *The Advertiser*, October 2016; *Toronto Telegraph*, October 2016). In response, ACARA stated that there were no plans to change NAPLAN to incorporate such testing.

### *Enquiries*

Responses were provided to a constant and wide variety of enquiries during the 2016–17 monitoring period.

Jurisdictional health and physical education educators have enquired about: aspects of the ethical understanding general capability, sexuality education policy, gender diversity in Foundation – Year 2, swimming, physical literacy, emotional intelligence, mandated physical activity, literacy, unit planning, parent materials and outdoor education.

Teachers have also asked about qualifications needed for teaching aspects of the Australian Curriculum: Health and Physical Education, assessment of content descriptions, use of the achievement standards, access to scope and sequence documents, links between Year 10 Health and Physical Education and the senior secondary curriculum, and food and hospitality and work samples.

University staff and students have enquired about outdoor education, LGBTI issues in the curriculum, physical activity and sport in schools, suicide, depression, assessment rubrics, health and physical education propositions, structural elements of the Australian Curriculum: Health and Physical Education, and first aid.

Journalists posed questions about swimming and cardio-pulmonary resuscitation, the relationship between fitness and sport, outdoor learning, sexualisation in the media, and sexuality education in general.

Responses have also been provided to general enquiries about mandated physical activity in schools, copyright of Australian Curriculum: Health and Physical Education resources, curriculum mapping, parent-friendly resources and sexuality education for students with disabilities.

ACARA has provided support across most states and territories to a variety of stakeholders over this monitoring period. Most of this work has focused on promoting and explaining the Curriculum Connections resources, Health and Physical Education assessment and reporting, and incorporating the general capabilities into Health and Physical Education curriculum planning.



Work has included the following:

- advising project officers (Learning Design, Assessment, and Moderation, Department for Education and Child Development, South Australia) in relation to Health and Physical Education and critical and creative thinking
- advising the manager (Premier's Challenges, Learning Improvement Division, Department for Education and Child Development, South Australia) regarding Health and Physical Education curriculum messages to principals
- meetings with the education manager (South Australian Health, and Medical Research Institute) about resilience
- providing feedback on Health and Physical Education unit planning processes in the Northern Territory and South Australia
- providing feedback at the National Physical Literacy Workshop organised by the Australian Sports Commission and held in Melbourne
- providing feedback at the National Preventative Health Forum organised by the Australian Sports Commission and held in Melbourne
- discussing volunteering in the Australian Curriculum: Health and Physical Education with the Department for Education and Child Development, South Australia, and cross-government representatives
- reviewing the National Safe Schools framework as it migrated to the Student Wellbeing Hub for Education Services Australia
- reviewing Queensland and Tasmanian senior secondary Health and Physical Education courses that will be used across all sectors
- advising the Director Curriculum Services, Tasmania about resources that support understanding of the Australian Curriculum: Health and Physical Education
- contributing to an Education Services Australia Student Wellbeing Hub podcast about drug education
- reviewing the two-year cycles of Health and Physical Education curriculum delivery for Northern Territory Education Department
- collaborating with Outdoor Education Australia to develop and review content for the Curriculum Connections resource: Outdoor learning
- advising ReachOut.com in relation to how bullying is addressed in the Australian Curriculum
- participating in an interview with Monash University in relation to the Health and Physical Education propositions and their use across Australia
- discussing physical literacy with the Australian Sports Commission
- consulting with Active Healthy Kids Australia regarding strategic directions.

Presentations for stakeholders have included the following:

- Using the achievement standards, University of South Australia, July 2016
- Child Protection Network Meeting, Catholic Education South Australia, November 2016
- Number 21st Century Learning and General Capabilities workshop, Association of Independent Schools, SA, November 2016
- Australian Council for Health, Physical Education and Recreation (South Australia) Secondary Health and Physical Education Conference, December 2016
- International Australian Council for Health, Physical Education and Recreation Conference, January 2017
- Understanding the Health and Physical Education framework, Nyangatjatjara College, Northern Territory, January 2017
- Primary and Secondary Assessment Moderation, Australian Council for Health, Physical Education and Recreation, South Australia, March 2017
- Assessing Student Work in the Australian Curriculum: Health and Physical Education forum, Australian Council for Health, Physical Education and Recreation, South Australia, April 2017
- Outdoors Victoria's International Research Symposium, May 2017
- Health Education Toolkit – primary and secondary, Northern Territory Department of Education, June 2017
- Outdoors Victoria Conference via video link, June 2017
- Australian Teachers of Outdoor Education Network meeting via video link, June 2017.

Requests for ACARA representation and participation in the following groups have been received and provided during this monitoring period:

- National Respectful Relationships Education Expert Group
- the Disaster Resilient Australia-New Zealand School Education Network
- TrackSAFE
- BRAVE Foundation
- Respectful Relationships Education working group
- SPG Countering Violent Extremism working group

### *Google analytics*

The Health and Physical Education pages of the Australian Curriculum website for the 2016–17 monitoring period were accessed slightly less than in the previous 12 months. There was a total of 398,000 Health and Physical Education pageviews compared with 420,000 last year. This represents a decrease of five per cent. Pageviews for version 7.5 were minor, albeit slightly higher than last year.

The number of pages per session measure was down on last year for Health and Physical

Education, but the average session time was higher, suggesting that users may be spending more in-depth time investigating chosen pages. The curriculum pages continued to be the most popular. In particular, the Foundation – Year 10 curriculum by rows view, and access to the pdf documents was up 80 per cent on the last monitoring period.

### *Issues for consideration*

International researchers in the field of neurobiology and exercise science have a consensus view that voluntary physical activity and exercise training can influence brain plasticity by facilitating neurogenerative, neuroadaptive and neuroprotective processes (Dishman, 2006). Connected to such findings, a joint media statement entitled *Australia's peak education bodies call for Health and Physical Education needs to be at the forefront of our children's education* was released by the Australian Council for Health, Physical Education and Recreation (ACIPHER), Australian Primary Principals Association, Australian Secondary Principals Association, and Tennis Australia in March 2017 (ACHPER, 2017). The statement refers to the Australian Lifestyle of our Kids study (LOOK) led by Professor Dick Telford (Telford, et al., 2012). Findings of the study indicated that quality health and physical education, in addition to providing a range of health benefits, improves academic performance in schools, in particular NAPLAN results. The focus is on quality as well as quantity and has implications for the future development of the Australian Curriculum: Health and Physical Education, as well as allocation of time provided to Health and Physical Education by schools and/or sectors. Australia ranked seventh of 70 countries in the number of days per week students reported they attended PE classes. This was just above the OECD average and was below Hungary, Poland, Russia, Japan, the USA, and New Zealand (OECD, PISA 2015 Results [Volume III]: Students' Well-Being, 2017). The report indicated that in many countries, schools struggle to cover the breadth of health and physical education as well as incorporate relevant aspects of general capabilities and cross-curriculum priorities within current program limitations.

There are ongoing tensions surrounding the concept and definitions of physical literacy. ACARA is currently involved in consultation with Australian Sports Commission about the Preventive Health and the National Sport Plan as well as the draft Physical Literacy Standards. There is a need to constantly clarify the differences and similarities between health and physical education, physical education, physical activity, physical literacy, and sport in relation to the core content of the Health and Physical Education learning area. It may well be that the international focus on increasing physical activity moves responsibility for keeping school-aged children and young people active from being the sole domain of the Health and Physical Education learning area to its inclusion in all learning areas. There are some other areas of health content that could be seen as a whole-school responsibility, for example, building resilience and enhancing and managing mental health.

Schools are increasingly being tasked with improving students' health-related outcomes such as increasing physical activity, reducing sedentary behaviour, and reducing obesity. Globally there is a focus on non-communicable (and mostly preventable) health issues such as obesity, diabetes, tobacco use, sexually transmitted infections, and child abuse (Chan M. , 2017). Although playing a preventative health role, such demands must be kept within the educative purpose of the health and physical education curriculum. Positive health outcomes will require a

collaborative approach across schools, community and across government (COAG, 2015).

The OECD explains that:

Being bullied can negatively affect academic achievement because it influences students' capacity to focus on academic tasks. Schools where the incidence of bullying is high by international standards (more than 10 per cent of students are frequently bullied) score 47 points lower in science, on average, than schools where bullying is less frequent (schools where less than 5 per cent of students are frequently bullied). These relationships suggest that bullying can both stem from and may exacerbate students' disengagement with school and underperformance. Although bullying is a school-wide issue, teaching skills to deal with it effectively still warrant curriculum time. (OECD, How much of a problem is bullying at school?, 2017)

Other issues that continue to impact on the implementation of the Australian Curriculum: Health and Physical Education include those of teacher qualifications, confidence and skill. The need for specific training of teachers who are required to deliver the Health and Physical Education curriculum has been recommended (Lynch, 2015) (Pill, 2016) and the implications for pedagogy and assessment from outsourcing Health and Physical Education delivery have been a focus of inquiry and research (Sperka & Enright, 2017). Outsourcing aspects of the Health and Physical Education curriculum to external providers or health agencies, which may not understand its scope or intent, may impact on schools and have implications for the future design of the learning area.

## **Technologies**

The Australian Curriculum: Technologies was endorsed by Education Council in September 2015 and published on the Australian Curriculum website in October 2015.

Education authorities in each state and territory determine the timelines for implementation of the Australian Curriculum in schools. Most states and territories implemented or trialed the Technologies curriculum or developed implementation plans during the 2016–17 monitoring period. It is anticipated that jurisdictions will be implementing the curriculum in most band levels in 2018.

Implementation of the Technologies curriculum continues to be well-supported by government programs such as the National Innovation and Science Agenda initiatives, the development of resources such as the Digital Technologies Hub, and by universities and industry. National professional teacher associations continue to provide support for both Design and Technologies, and Digital Technologies.

The Technologies work sample portfolios were published in 2016 and were well-received by teachers. At least four work samples are provided for each band at each level.

## **Key points**

### *Jurisdictional feedback*

Jurisdictional feedback in the 2016–17 monitoring period was requested in the areas of student diversity and cross-curriculum priorities. In supplying detailed responses to these two aspects of

the Australian Curriculum, there was no reference to the Australian Curriculum: Technologies.

### *Media*

During the 2016–17 monitoring period, most curriculum authorities and jurisdictions moved to implement the Australian Curriculum: Technologies curriculum, including reporting and assessing. As a result, the curriculum saw considerable media attention and public interest, with coding continuing to lead the headlines. Generally, there was positive coverage, with some areas of the media focusing on how schools are fostering the development of coding skills to assist Australia’s economy. Computational thinking and design thinking were being viewed as essential skills, with industry experts stating:

the challenge for Australia right now is ensuring our education system delivers forward-thinking, digital-savvy workers and entrepreneurs who can capitalise on rapidly converging technologies including automated algorithms, machine learning, artificial intelligence, big data, Blockchain and the internet of things. (Wong, *The Australian*, March 2017)

The importance of the Australian Curriculum: Technologies curriculum in schools was evident through the strong media coverage. Luke Michael stated in relation to coding, “Young people are at risk at being unprepared for the future workplace unless digital skills are taught as a priority to all primary school students” (*The Australian*, March 2017). With all states and territories except for NSW, now having either implemented elements of the Australian Curriculum: Technologies or having a timeline for implementation, schools have a foundation for developing students who can resolve society’s digital needs in imaginative ways.

Media relating to food and fibre production was limited but generally very positive. Danielle Buckley highlighted the positive impact that introducing agriculture has had on the boys at Belmore High School, “We were struggling to engage with the boys and keep them in school”. (*The Daily Telegraph*, March 2017). Engineering was most frequently mentioned in relation to STEM education. There were an increasing number of articles focused on STEM, with evidence of real-world application such as the SolarBuddy student project sending solar lights to Papua New Guinea (*Energy Matters*, July 2016).

Another topic that continued to emerge in the media was the gender bias in the technology industry. Coverage was positive, with articles reporting an increase in girls taking up coding courses and moving into the industry:

Unlike America, Australia is building an inclusive narrative that fosters the development of young girls and women in STEM and our economy will reap the benefits over the longer term. (www.kidspot.com.au, March 2017).

A 2016 report from Australia’s Chief Scientist, Alan Finkel, found the number of people qualified in science, technology, engineering and mathematics (STEM) areas was increasing. However, only 16 per cent of the 2.3 million STEM qualified people in Australia were women (*Radio Australia*, March 2017).

### *Enquiries*

There were a small number of enquiries regarding the Australian Curriculum: Technologies curriculum. These included local requests for clarification regarding terminology, such as

programmable multimedia assets, the place of the Internet of Things (IoT) in the curriculum and a query about the software used in a work sample. Some clarity was sought in relation to materials in Design and Technologies and the place of agriculture in the curriculum. International enquiries included a request to provide advice to the Ayrton Senna Institute Brazil on the development of the Digital Technologies curriculum.

Requests for presentations have included sessions at the ICT Educators NSW workshops in Wagga Wagga and Bathurst; Australian Curriculum Studies Association (ACSA) webinar on Critical and Creative Thinking in Technologies; Criterion Conference, Brisbane; Leading Learning for the Future Conference, Sunshine Coast; ACSA STEM symposium; Google Summit, Sydney; Associate Deans of ICT forum, Adelaide; Australian Council of Deans of Engineering, Sydney; Australian Computer Society's Digital Technologies panel, Brisbane; Australian Council for Computers in Education Conference, Brisbane; Technology Education Research Conference, Adelaide.

In addition, once-per-term meetings are facilitated by ACARA for industry, government and universities on supporting implementation of the Australian Curriculum.

### *Google analytics*

The Technologies pages were accessed over 525,000 times, representing an increase of almost 20 per cent on last year. Overall pageviews for the whole website were down 9 per cent.

The Digital Technologies pages in particular experienced a large increase in views – up 34 per cent. This reflects the growing interest in this area of student learning and the fact that the information communications general capability pages are second only to literacy in user interest for the general capabilities.

Design and Technologies pageviews were also up 13 per cent on the last monitoring period. Access to version 7.5 of the Technologies pages continued its decline, down 14 per cent.

As for many other learning areas, users from Queensland and South Australia were the most frequent visitors to the Technologies pages, followed by Victoria and New South Wales.

### *Issues for consideration*

In the review of research for 2016–17, the following issues for consideration have been identified: the changing nature of employment, in particular, emphasis on 'soft' skills and enterprise; the continued focus on Science, Technology, Engineering and Mathematics (STEM) education; the significance of curriculum design decisions internationally in countries such as Japan; and the short-term trends of the Horizon Report 2016.

The Foundation for Young Australians analysed job data and interviewed employers to identify the skill sets needed by young Australians for future work and life in a complex world. Seven job clusters were identified (designers, technologists, artisans, generators, coordinators, informers and carers) (Foundation for Young Australians, 2017). Many of these skills are often referred to as 'soft' skills and are reflected in the general capabilities and evident in the Technologies curriculum in the 'collaborating and managing' thread. Addressing these soft skills through the curriculum in the Technologies (Zahedi & Heaton, 2017) was also the focus of initiatives such as

the European Union Grading Soft Skills (GRASS) Project (Seery, Canty, O'Connor, Buckley & Doyle, 2016). There was also reflection on the transferability of design skills: the skills that are required by many of the seven job clusters (Kimbell, 2017).

The continued focus on science, technology, engineering and mathematics (STEM) education potentially has implications for Technologies curriculum design. One of the areas for national action in the National STEM Education Strategy – building a strong evidence base – will contribute to our understanding of national trends and the factors that contribute to effective STEM learning. National Innovation and Science Agenda projects such as the Early Learning STEM Australia (ELSA) and the Massive Open Online Courses developed by the University of Adelaide provide insights into Technologies knowledge and understanding. For example, the four STEM apps planned for ELSA are: patterns and recognition, location and arrangement, representations, and investigation. Each of these may inform future curriculum design in Foundation to Year 2.

*Engaging the future of STEM* (Chapman & Vivian, 2017) was a study of international best practice about how to engage young people and particularly girls in STEM. The analysis identifies key lessons from each initiative and highlighted the importance of context and critical and creative thinking. One of the identified challenges was “the lack of relevance to everyday life, STEM being an abstract construct” (Chapman & Vivian, 2017).

New National Curriculum Standards (NCE) are being developed in Japan for 2020. Four processes have been identified for inclusion:

- framing and designing problem solutions
- technology assessment and trade-off
- technological management and its practical use
- reflective evaluation

(Yamazaki, Isobe, Oomori, & Ueno, 2016).

In lower secondary, it is proposed that Japanese students will address four content areas, with parallels to the Australian Curriculum: technology used in our daily life and society, technology for material and creation, technology for living matter, and technology for information (Yamazaki, Isobe, Oomori, & Ueno, 2016).

The *NMC/CoSN Horizon Report: 2016 K–12 Edition* (Adams Becker, Freeman, Glesinger Hall, Cummins, & Yuhnke, 2016) identified coding as a literacy and robotics short-term future trend. The discussion explored the growth of coding clubs and extracurricular activities, as well as coding being addressed in curriculum as it is in Australia. Trends in Estonia, England and Finland were highlighted. While there is no specific requirement to address robotics through the Australian Curriculum: Technologies, it is context that is widely used to explore STEM and Digital Technologies.

## Languages

The F–10 Australian Curriculum: Languages is now published with the final curricula endorsed by the Education Council in December 2016: Australian Sign Language (Auslan) and a Framework for Classical Languages (including language-specific curricula for Classical Greek

and Latin).

The Australian Curriculum: Languages includes language specific curricula for 14 languages and two frameworks. The curriculum design reflects different learner language backgrounds and proficiency levels, and provides different learner pathways and entry points into language learning across Foundation – Year 10. For example, Auslan caters for hearing and non-hearing learners of the Australian Sign Language, and the Framework for Aboriginal Languages and Torres Strait Islander Languages caters for differences between the ecologies of the languages, and students who come from a variety of learner backgrounds.

During the 2016–17 monitoring period, ACARA began collecting student work samples in Chinese, French, Indonesian, Italian and Japanese to illustrate the achievement standards. This first phase of student work samples in Languages will be annotated and published on the Australian Curriculum website in early 2018.

### **Key points**

#### *Jurisdictional feedback*

During the 2016–17 monitoring period, there was no formal jurisdictional feedback made in relation to the Australian Curriculum: Languages. However, there were requests from several jurisdictions for more illustrations of practice and work samples across all the learning areas. With the Australian Curriculum: Languages now fully developed, ACARA is committed to publishing work samples that illustrate the achievement standards, with the first phase languages – Chinese, French, Indonesian, Italian and Japanese – to be published in 2018.

#### *Media*

Much of the media interest during the 2016–17 monitoring period in relation to Languages and languages learning questioned which languages children should learn in Australian schools in the increasingly interconnected world. A recurring theme was that whilst there is considerable take-up of languages programs in states and territories and in individual schools, the challenge lies in encouraging all students to study additional languages. Reports highlighted that Australia is generally falling behind the rest of the world in terms of systematic and sustained language learning. This issue was raised in articles such as ‘Government rolls out program for pre-schoolers to learn new languages’ (*International Business Times*, January 2017); ‘ABC Kids to offer preschool programs in Mandarin’ (*ABC*, January 2017); ‘Northern beaches preschools teaching kids a second language’ (*Manly Daily*, May 2017); ‘High demand for new Adelaide bilingual schools at Plympton and Highgate’ (*The Advertiser*, January 2017); ‘Teacher shortage blamed for failed plan to boost foreign language study in schools’ (*CENtRAL*, March 2017); ‘What languages should children be learning to get ahead?’ (University of Southern Queensland, March 2017); ‘Chinese teachers to fill NT school void’ (*NT News*, April 2017); ‘Census 2016: Second-language learning in Australia ‘needs urgent attention.’’ (*SBS*, June 2017); and ‘Only 10 per cent of year 12 students are studying a different language’ (*4ZZZFM.ORG.AU*, July 2017).

The publication of the Auslan curriculum was applauded for allowing both non-hearing and



hearing students the opportunity to learn the Australian Sign Language. Media articles and interviews highlighted equity and inclusion. 'Hearing impaired kids starting school on par with their peers' (*Illawarra Mercury*, January 2017); 'Interview with Stephen Nicholson, Tasdeaf, about adding Auslan to AC' (*ABC Radio Hobart*, February 2017); 'Hearing impairment program's wide appeal' (*Australian Teacher Magazine*, March 2017); 'Sign language: Call for Auslan lessons in Vic schools' (*Herald Sun*, March 2017); 'St Elizabeth's Catholic PS youngsters get the sign during Auslan classes' (*Wanneroo Times*, June 2017); and 'Helping students thrive' (*Hills Shire Times*, June 7, 2017).

The most prominent and recurring issue in the media was in relation to Aboriginal and Torres Strait Islander Languages. Many articles referred to the importance of the First Peoples of Australia being able to study their language and the need to maintain and, in many cases, revive Indigenous languages. The focus of the articles was the close link between effective learning and progress when a student can learn in mother tongue as well as the language of instruction, English. There was a strong connection made between giving young Indigenous people the opportunity to learn in their cultural language and closing the educational achievement gap. The importance of this issue was reflected in the theme for NAIDOC Week: Our Languages Matter. Articles and reports included 'Did you know there are over 250 distinct Aboriginal and Torres Strait Islander nations across Australia' (*SBS Walk with Us*, January 2017); 'Local language education will help close the gap' (*ABC Radio Australia*, February 2017); 'Long way to go in closing the ACT's Indigenous education gap' (*The Canberra Times*, March 2017); 'Some 100 indigenous Australian languages have fallen out of use since colonisation' (*Walk with Us*, translated from the Portuguese, March 2017); 'Learn words in Indigenous Australian languages with four young speakers' (*Awaye!*, March 2017); 'New TV series Little J & Big Cuz explores Indigenous culture, country and language' (*NITV*, April 2017); 'Last fluent Ngandi speaker works to pass on endangered Indigenous language' (*ABC News*, April 2017); 'Aboriginal Languages in School' (*Radio Adelaide*, May 2017); 'Protecting Aboriginal Languages: A powerful tool for culture and conversations' (*NITV SBS*, May 2017); 'Do our teachers care enough about Indigenous Australia to bring it into the classroom?' (*NITV SBS*, May 2017); 'Closing the gap, one inspired student at a time' (*The Educator*, May 2017); 'ANU's John Giacon wins Patji-Dawes Award for Indigenous language efforts' (*The Brisbane Times*, May 2017); 'Is policy on Indigenous education deliberately being stalled?' (*The Conversation*, June 2017); 'Keeping Indigenous language alive' (*The Feed SBS Viceland*, July 2017); 'Why more schools need to teach bilingual education to Indigenous children' (*The Conversation*, June 2017); 'Learning in a language you understand' and 'Barker College agrees to launch Aboriginal academy for girls in Utopia homelands' (*ABC News*, June 2017); 'Arrernte language on agenda in NT amid calls for bilingual education for Aboriginal kids' (*ABC News*, July 2017); 'NAIDOC Week: North Queensland Indigenous leaders lament loss of traditional languages' (*ABC Tropical North*, July 2017); 'NAIDOC Week 2017: Spotlight on reviving a native tongue' (*Katherine Times*, July 2017); 'Gathang language revival celebrated' (*Port Macquarie News*, July 2017); 'If you want to keep failing, keep talking to remote communities in English' (*NITV*, July 2017); and 'NAIDOC Week: Lost Indigenous languages concerns Central Victorian youth' (*ABC Central Victoria*, July 2017).

### *Enquiries*

During the 2016–17 monitoring period, many of the enquiries were associated with aspects of the implementation of the Australian Curriculum: Languages. Individuals and schools sought clarification whether, for example, hours of learning, textbooks, or particular subjects were mandated in the curriculum. Many of these enquiries demonstrated a lack of awareness of the different jurisdictional responsibilities of states, territories and systems.

There were also queries concerning the availability of Languages subjects and resources, such as student work samples, the availability of Auslan in schools, and senior secondary Languages curricula.

Enquiries from outside Australia related to the different entry points and various learner pathways that the Australian Curriculum offers (from the United States of America), the strong connection between language acquisition and culture in the Australian Curriculum (from Sweden) and the provision of a curriculum for the study of languages in the senior years (from Denmark).

In response to requests from jurisdictions and sectors for Languages work samples, the curriculum specialist: languages delivered workshops on the Australian Curriculum: Languages content and achievement standards. These workshops supported teachers in various states and territories in collecting work samples that the product of quality formative and summative assessment tasks that illustrate performance against the Australian Curriculum achievement standards. Workshops involving teachers from Catholic, governmental and independent schools were conducted in the Australian Capital Territory, Northern Territory, Queensland and South Australia during the 2016–17 monitoring period.

### *Google analytics*

During the monitoring period 2016–17, there was a decrease of 2.4 per cent of total Languages pageviews from the previous year: 213,000 versus 218,000 last year.

Access to the Japanese pages was the highest of all the Languages, as in previous periods, representing 22 per cent of the total, followed by Chinese at 13 per cent and French at 11 per cent. After the Introduction pages, the most common page viewed was the Context Statement for Japanese.

Despite being a new addition to the Australian Curriculum, and only being available for half of the monitoring period, pageviews for Auslan represented 9 per cent of the total pageviews for Languages.

Users from Queensland and Victoria were the most frequent visitors to the Languages pages.

### *Issues for consideration*

During the 2016–17 monitoring period, a recurring theme in the development and design of Languages curricula was the acknowledgement of the importance of multilingualism as an integral part of communication, intercultural interaction and as an essential element of 21<sup>st</sup> century skills development. Whilst students need to know language content and acquire the

skills for proficiency in language, in order for young people to survive and thrive in the 21<sup>st</sup> century, it is essential for them to be able to connect their local world to the global and vice versa. It has been argued that acquiring a subsequent language helps literacy in first language, intercultural understanding and critical thinking (Stein-Smith, 2016, p. 254).

Intercultural understanding continued to be supported through the teaching and learning of languages. Life in the 21<sup>st</sup> century is global and interconnected, and new skills are needed to succeed in education and in the workplace. The ability to communicate in several languages is among the key skills needed to meet labour market demands. Like other transferable skills, it makes both individuals and the economy more competitive. In this regard, nearly two decades ago, the Barcelona European Council called for action “to improve the mastery of basic skills, in particular by teaching at least two foreign languages from a very early age” (Barcelona European Council, 2002). The European Commission has continued to support and promote “Bringing very young children into contact with foreign languages” maintaining that it:

... may result in faster language learning, improved mother tongue skills and better performance in other areas. As well as laying the foundations for later learning, early language learning can influence attitudes towards other languages and cultures ... Languages ... can serve as a bridge to other people and open access to other countries and cultures, promoting mutual understanding. A successful multilingualism policy can strengthen the life chances of citizens: it may increase their employability, facilitate access to services and rights, and contribute to solidarity through enhanced intercultural dialogue and social cohesion. (European Commission, 2011)

Irenka Suto, Principal Research Officer University of Cambridge, wrote in her paper *21<sup>st</sup> Century skill: Ancient, ubiquitous, enigmatic?*:

Multilingualism ... is often considered a key part of communication within a global world. The term can mean different things for different people. For employers ... to communicate in international meetings as well as to read technical and specialised documents. For some educationalists ... learning another language ... enables people to understand their own first language in a different way, building more sophisticated lifelong learning patterns (Puntis 2011) ... multilingualism is an important contributor to the third skill construed by the research venture Assessment and Teaching of 21<sup>st</sup> century skills (ATC21S): “learning to learn”. (Suto, 2013)

There is evidence that learning a language not only helps the elderly avoid dementia but also helps the young improve memory and concentration, and develop critical and creative learning skills. This was supported by a recent report into languages learning in countries that rank highly in the Programme for International Student Assessment (PISA): in these countries, language-learning is compulsory, starts at an early age, and is a valued and regular part of the curriculum. In other words, countries that rank highly have adopted an active bilingual program that is explicit and mandated in the curriculum.

The 2012 report by the Education, Audio-visual and Culture Executive Agency (EACEA) supported similar findings. Funded by the European Commission, the report was based on data from 32 European countries. The report provided a comprehensive picture of the state of foreign

language study in Europe and found that successful curricula have three points in common:

- language learning is compulsory and in demand
- language teachers are highly qualified
- language learning is substantive and sustained.

(Education, Audiovisual and Culture Executive Agency, 2012)

John Hajek, Professor of Italian Studies and Director of the Research Unit for Multilingualism and Cross-cultural Communication (RUMACCC) at the University of Melbourne, has argued that to develop the skill of intercultural capability is to promote tolerance and intercultural comprehension. Learning a second language is both an end in itself but also an effective proxy for the kind of intercultural understanding that will be essential if Australia is to continue to thrive in its diversity. Assistant Professor Ruth Fielding argued in *Multilingualism in the Australian Suburbs: A framework for exploring bilingual identity* that Australia's multilingual diversity is being stifled by a monolingual culture and approach to curriculum in schools (Fielding, 2015).

Recent Australian research has continued to reference these themes. Associate Professor of Applied Linguistics at the University of Southern Queensland, Warren Midgley, stated that "learning another language enhances brain functions such as memory, perception and reasoning. It also helps build literacy skills" (Midgley, 2017).

The paradox for Australia is that whilst the 2016 census confirmed that Australia was more multicultural than ever:

This makes Australia a hugely diverse nation ... No other data captures and reflects multicultural Australians like our Census does ... Our own 'nation of nations' continues to flourish with each Census (Australian Bureau of Statistics, 2017),

it is decidedly a monolingual country despite the plethora of initiatives and policy changes at state and national levels. Close to 70 policy-related reports and investigations have been undertaken into languages education in Australia over more than two decades (Asia Educaion Foundation, 2014, p. 13).

Recognition of the significance of language learning in the Australian context can be found in the words of the Australian Government Department of Prime Minister and Cabinet (2014):

In a globally connected world, languages are valuable and useful as tools for communication, relationship building and the transfer and advancement of knowledge. The ability to speak a language in addition to English enhances Australia's competitive edge in a global economy.

The challenge for Australia set by these reports is to become bilingual and/or plurilingual and to give young people an opportunity to flourish in a world where effective communication and intercultural understanding are increasingly important. Through engagement with languages and cultures, young people can become better informed and knowledgeable and this will facilitate more meaningful intercultural interaction and understanding and could provide a key to global wellbeing.

## General capabilities

The general capabilities were developed to inform the writing of each learning area curriculum and were first published in 2010. The general capabilities encompass knowledge, skills, behaviours and dispositions that students develop as they learn to apply and understand content taught within each of the learning areas. There are seven general capabilities identified in the Australian Curriculum: Literacy, Numeracy, Information and Communication Technology Capability, Personal and Social Capability, Critical and Creative Thinking, Ethical Understanding, and Intercultural Understanding. Embedding the general capabilities, as appropriate, in learning area content supports the development of 21<sup>st</sup> century skills and dispositions in learners.

Resources available on the Australian Curriculum website include information describing the nature and scope of each capability, organising elements that underpin each learning continuum, learning continua that describe the knowledge, skills and behaviours that students can be expected to develop at particular stages of schooling, and high-level advice material on the place of the capabilities within the learning areas. Educators may also use the general capabilities to adjust the focus of age-equivalent learning area content to differentiate instruction for students with diverse learning needs.

### **Key points**

#### *Jurisdictional feedback*

Jurisdictional feedback for the 2016–17 monitoring period was requested on the implementation of the cross-curriculum priorities and the student diversity resources published on the Australian Curriculum website. In relation to the general capabilities, feedback focused on the advice available in the student diversity section regarding the use of the Literacy, Numeracy and Personal and Social Capability to differentiate instruction for students with diverse learning needs.

The Victorian Curriculum and Assessment Authority's submission provided detailed feedback regarding the approach taken by Victoria in implementing the general capabilities. The Victorian Curriculum modifies the Australia Curriculum: general capabilities to encompass four of the seven general capabilities: Critical and Creative Thinking, Ethical Understanding Capability, Intercultural Understanding Capability, and Personal and Social Capability. The Victorian Curriculum provides content descriptions and achievement standards for these capabilities and their submission noted that the:

... design of the Victorian Curriculum F–10 acknowledges that capabilities are a set of discrete knowledge and skills that can and should be taught explicitly in and through the learning areas, but are not fully defined by any of the learning areas or disciplines. (Victorian Curriculum and Assessment Authority, 2017)

#### *Media*

Media coverage relating to the general capabilities related to the importance of providing young people with the opportunity to develop 21<sup>st</sup> century skills to enable them to prepare for the

future.

In February 2017, Dr Michael Anderson and Dr Miranda Jefferson published *Transforming Schools: Creativity, Critical Reflection, Communication, Collaboration*. The release of this publication received attention in the media and reports highlighted school change as the process through which these capabilities would be effectively developed:

The time to do this is now because ignoring creativity, collaboration, critical reflection and communication and leaving it to chance may leave our schools and our kids unable to face the challenges of this brave new world. If we miss this opportunity we will be the generation that let our schooling fade into irrelevance because we lacked the imagination to create change. (Michael Anderson, *Sydney Morning Herald*, 7 March 2017)

On March 27, 2017, the Mitchell Institute at Victoria University released its report *Preparing Young People for the Future of Work* (Torii K. , 2017). This report outlined issues faced by young people as they transition from schooling to the workforce. It identified several key challenges, including changes to the traditional pathways for entering the workforce and the evolving nature of careers available for young people as they complete studies at both secondary and tertiary levels. The report highlighted that whilst the Australian Curriculum explicitly included outcomes based on developing 21<sup>st</sup> century skills, more needed to be done to ensure these were addressed uniformly:

The National Curriculum includes a range of broader learning outcomes – general capabilities such as critical and creative thinking, personal and social capability, and ethical understanding. However, there is no consistent national approach to measuring and tracking the general capabilities, and each jurisdiction is able to determine the extent to which they are assessed and reported (Australian Curriculum). It is not yet well understood by all schools how to teach capabilities, although some schools are moving to include them. (Torii, 2017)

The media coverage of this report was favourable regarding the inclusion of the general capabilities as a dimension of the Australian Curriculum and affirmed that more needed to be done regarding the embedding of this dimension of the curriculum into classroom practice:

... schools are not successfully teaching the broader skills needed for the 21<sup>st</sup> century workplace, such as creative and critical thinking, collaboration, curiosity and resilience. Even though some broader capabilities are included in curriculums, "they are not being taught or assessed in any systematic manner."  
(Tim Dodd, 'Australian Schools are stuck in the industrial era, says Mitchell Institute', *The Australian Financial Review*, 24 March 2017)

### *Enquiries*

Enquiries relating to the general capabilities during the 2016–17 monitoring period included requests for:

- development of the general capabilities continua to extend into the senior secondary curriculum
- information on the development of the general capabilities to support doctoral and research projects

- additional information on ways to use the literacy and numeracy continua to support student learning
- advice on how to interpret key phrases within the ethical understanding continuum, such as ‘ethical and non-ethical dimensions of complex issues’ within Health and Physical Education
- technical support and advice on how to download the general capabilities continua in a format other than pdf
- images and posters for each capability.

The curriculum specialist: general capabilities supported the followed jurisdictional initiatives during the 2016–17 monitoring period:

- working with the SA Association for Independent Schools to develop and present workshops to support schools embedding the personal and social capability within learning areas as a way of increasing student engagement
- managing and delivering a cross-jurisdictional project to develop units of work and work samples for the Australian Curriculum resources portal, which illustrate various approaches by jurisdictions to the implementation of the general capabilities
- presenting at the Primary Principals NSW Curriculum advisory group meeting to provide information on the development of resources and the progress of a range of curriculum based projects
- participating in a Principals Australia Institute online seminar on the personal and social capability
- developing a high-level explanatory video published on the Australian Curriculum website as a response to 2015–16 monitoring period jurisdictional feedback
- working with NSW government schools’ leaders and teachers to support their understanding of the critical and creative thinking capability.

### *Google analytics*

There was a continued increase in interest in the general capabilities pages during the 2016–17 monitoring period, up 9.4 per cent overall, with the largest increases in access recorded for the Critical and Creative Thinking, overview and literacy pages. However, there has been a decrease in views of the Information Communications Technologies Capability, Intercultural Understanding, and Ethical Understanding.

### *Issues for consideration*

Educators all over the world are working to identify and define the competencies that will develop the aptitudes and skills young people require for future study and work.

The OECD Future of Education and Skills: Education 2030 project is developing a two-strand approach to an international framework for action. The first strand focuses on clarifying the competencies required for participation in society and work in 2030. The project identifies the competencies that are articulated in a range of school curricula internationally. The key goal of

this strand of the project is to provide an avenue for international discussion, to develop a common language within a multidimensional framework for use by countries as they revise policy and curriculum in the future. The second strand is an international curriculum comparison and analysis. This strand considers perceptions of curriculum overload and the development of an evidence-based process for curriculum redesign.

UNESCO's *The Futures of Learning* working paper series outlined three areas for consideration in relation to the inclusion and strengthening of 21<sup>st</sup> century skills in international curricula. Each of the three papers detailed literature reviews relating to the complex issues faced by nations on how to prepare young people effectively for the future. *The Futures of Learning* identified some of the main drivers “working to transform what learners are taught and the methods used for teaching and learning” (Scott, *The Futures of Learning 1*, 2015).

Factors such as globalisation, new technologies, migration, international competition, marketplace and work force changes, and transnational environmental and political challenges are identified for nations to consider as they review and reform curriculum and education systems. *The Futures of Learning 2: What kind of learning for the 21<sup>st</sup> Century?* provided a review of the literature focused on which “competencies and skills are deemed necessary for today’s societies” (Scott, *The Futures of Learning 2*, 2015). It cited the multiple approaches taken by international bodies to identify the competencies for the future and develop frameworks for action. The paper identified personalisation, collaboration, communication, informal learning, productivity, and content creation as key elements needed for effective learning.

*The Futures of Learning 3: What kind of pedagogies for the 21<sup>st</sup> century?* addressed the arguments relating to “transforming pedagogy to better support the acquisition of 21<sup>st</sup> century skills”. The summary of the literature in this area identified several pedagogical approaches that promote learning to foster the development of skills and competencies (Scott, *The Futures of Learning 3*, 2015). The report made clear the link needed between the intention to include the development of skills within curricula and the delivery of this curricula in classroom and less formal environments.

The World Economic Forum in collaboration with the Boston Consulting Group produced two reports focusing on the issue of young people having skills gaps, as they moved from schooling to the work place, and identified ways the use of technology may address this issue. *New Vision for Education: Unlocking the Potential of Technology* identified, through meta-analysis of research in primary and secondary education, 16 skills necessary for student success. These skills were further distilled into three broad categories:

- foundational literacies – how students apply core skills. These included literacy, numeracy, scientific literacy, ICT literacy, financial literacy, and cultural and civic literacy.
- competencies – approaches students may take to complex challenges. These include critical thinking and problem-solving, creativity, communication, collaboration.
- character qualities – how students approach their changing environment. These include curiosity, initiative, persistence/grit, adaptability, leadership, and social and cultural awareness (World Economic Forum, 2015).



The second report, *New Vision for Education: Fostering Social and Emotional Learning through Technology* (World Economic Forum, 2016) made the link between social and emotional learning (SEL) and the competencies and character qualities identified in the first report. It identified the benefits of SEL on both academic performance and life outside educational settings.

The Foundation for Young Australians has also released its fourth report, *The new work smarts*, which detailed the skills young people will need to 'work smart' in the future. Through the analysis of 20 billion hours of work completed by 12 million Australians, the report identified three mindsets that young people will need to adopt for a successful future. Smart learning, smart thinking, and smart doing were identified as the key mindsets for young people to develop (Foundation for Young Australians, 2017). The report called for policy makers to support the development of enterprise skills, science and maths, and more independent and entrepreneurial working:

There is an urgent need for investment in a national enterprise skills and careers education strategy in schools that begins in primary school, is delivered in ways that young people want to learn, and provides accurate information about the skills that will be important in the future. (Foundation for Young Australians , 2017)

### **Cross-curriculum priorities**

The inclusion of the cross-curriculum priorities in the Australian Curriculum was endorsed by the Education Council in December 2010. ACARA's subsequent involvement with international organisations and curriculum development surveys, including the OECD and UNESCO studies, has indicated that the inclusion of this dimension is appropriate and useful for students in Australian education settings. The Aboriginal and Torres Strait Islander Histories and Cultures is one of the three cross-curriculum priorities.

In 2016, the Australian Government Department of Education and Training commissioned ACARA to develop illustrations of practice for the Aboriginal and Torres Strait Islander Histories and Cultures Priority as a way of improving teacher engagement with this dimension of the Australian Curriculum, Foundation – Year 10. Schools that were using the priority in innovative ways were identified to participate in the production of videos, which told the story of their school community's approaches to embedding the priority. The illustrations published on the Australian Curriculum website in July 2017 were accompanied by contextual information from each of the schools and a set of guiding principles to support educators' understanding of the priority. The project was completed on 30 June 2017.

In October 2016, the ACARA Board formed the Aboriginal and Torres Strait Islander Education Taskforce, made up of members of the ACARA Board and ACARA's Aboriginal and Torres Strait Islander Education Advisory Group. The taskforce has been working on refining the Australian Curriculum F–10 to enhance the priority's content. Science has been the focus in the initial phase of the project.

ACARA worked with Reconciliation Australia to implement its Reflect Reconciliation Action Plan in February 2017. Each of the five business units has responsibility for a range

of deliverables, such as the development of external relationships with Aboriginal and Torres Strait Islander stakeholders, to assist with ACARA's reconciliation journey.

### **Key points**

#### *Jurisdictional feedback*

As jurisdictional feedback in the 2016–17 monitoring period was requested in this area, responses are included in section 7b, pp. 21–22.

#### *Media*

Media commentary about the priority related to the value and significance of teaching the priority to all Australian students and, specifically, to Aboriginal and Torres Strait Islander students. As in previous years, media coverage was most prevalent during NAIDOC Week. Teaching the priority should be a point of national pride as Australia has “one of the richest, deepest, oldest, most spiritual and most profound cultures on the planet” (*ABC News*, 28 June 2017). Media coverage offered ways to teach the priority including through new technologies and a number of new resources such as the *Little J & Big Cuz* animated television series. Questions about teachers' understanding and knowledge of the priority were raised and the wellbeing of students in the teaching of topics such as the Stolen Generations (*Mamamia*, 29 June 2017). The media commentary specific to Aboriginal and Torres Strait Islander students discussed the importance of teaching the priority for the development of student identity and for improving learning outcomes generally (*SBS*, 17 August 2016). Much of the commentary inextricably connected the histories and cultures of the priority to Aboriginal languages and Torres Strait Islander languages, and the need for the revitalisation or reinforcement of both the priority and languages through the curriculum (*NITV*, 16 November 2016; *National Indigenous Times*, 3 November 2016). The importance of language for closing the gap in learning outcomes of Aboriginal and Torres Strait Islander students is discussed in section 7d, p. 56 of this report.

### **Enquiries**

There was a limited range of enquiries during the 2016–17 monitoring period. In general, contacts offered positive comments about the Aboriginal and Torres Strait Islander Languages Framework or requested more information about the content descriptions and elaborations for the priority.

#### *Google analytics*

Interest in the three-dimensional elements of the Australian Curriculum continued during the 2016–17 monitoring period, with access to the cross-curriculum priorities pages recording an increase of over 20 per cent. Access to the page for the Aboriginal and Torres Strait Islander Histories and Cultures priority increased by almost one-quarter, making up over one-third of the total views of the cross-curriculum priorities, similar to previous monitoring periods.

### *Issues for consideration*

Two overarching themes that emerged from the review of the literature relating to the Aboriginal and Torres Strait Islander Histories and Cultures priority were the place of Indigenous knowledge and systems of knowledge in transforming curriculum, and the development of an inclusive curriculum that inspires social justice, equity and intercultural understanding. Of note was the place of the priority in the Science curriculum and how Indigenous practices and ways of knowing can inform, for instance, notions of sustainability.

Indigenous identity was identified as a key issue and included reference to a curriculum that:

- prepares students to live in two worlds (Baker, 2016)
- addresses equity issues in the provision of Indigenous perspectives (Kanu, 2017)
- targets the gap between learning outcomes of Indigenous and non-Indigenous students world-wide (Wilkins, 2017).

Culturally responsive leadership was a point of discussion relating to “the expanding bodies of literature” (Khalifa, Gooden, & Davis, 2016, p. 8) about schooling for minoritised students, social justice, and curriculum leadership that is both culturally diverse and equitable (Johnson, 2017) (Khalifa, Gooden, & Davis, 2016).

Discussion about teacher education and attitudes included issues such as teachers’ familiarity with students’ culture, for example, Taiwan, the United States of America, Canada and Australia (Chen, 2016), and attitudes of teachers towards the cross-curriculum priority (Baynes, 2016).

Science, STEM, and sustainability were learning areas discussed with a focus on the need for Indigenous perspectives, worldviews, and wisdom practices to be included in the curriculum (Snively & Williams, 2016). How Indigenous perspectives can give insight and guidance in solving complex environmental problems and ecological considerations of the 21<sup>st</sup> century was included, along with processes for the generation of new knowledge that may inform the development of curriculum (Snively & Williams, 2016) (Engeström, 2017) (Lowan-Trudeau, 2017) (de Sousa, Richter, & Raath, 2017) (Acosta Meza, 2016).

Culturally responsive curriculum that considered notions of decolonising curriculum and a socially just curriculum included issues such as:

- ecological practices and cultural heritage curriculum (Baines & Zarger, 2017)
- the use of terminology in the curriculum that represents historical events appropriately and how such events are acknowledged in the curriculum (Wahab & Agbola, 2017) (Rojas & Liou, 2017)
- an “asset-based approach to curriculum that acknowledges mandated standards but begins with recognising and valuing local knowledge” (Sharkey, Clavijo, & Ramírez, 2016, p. 1).

Another issue related to school engagement in partnerships with community/parents, including discussion about teachers’ participation in local funds of knowledge. Engagement such as this would:

reinforce the need for teachers to proactively move beyond the hegemonic safe zones of traditional teacher-dominated practices towards opening up spaces of dialogic, fluid engagement with families whose backgrounds differ from their own. (Chan & Ritchie, 2016)

## **Student diversity**

The Australian Curriculum sets the expectations for what all young Australians should be taught, regardless of their location in Australia or their background. Resources and advice materials are available on the Australian Curriculum website to support teachers in using the three dimensions of the Australian Curriculum to cater for the learning of all students including students for whom English is an additional language or dialect (EAL/D), gifted and talented students, students with disability, students from rural and remote contexts and students from low socio-economic settings.

### ***Key points***

#### *Jurisdictional feedback*

As jurisdictional feedback in the 2016–17 monitoring period was requested in this area responses are included in section 7b, pp. 22–24.

#### *Media*

In the 2016–17 monitoring period, there was little media regarding student diversity and the Australian Curriculum. The major media focus in relation to the curriculum meeting the needs of diverse students was on the release of the Australian Curriculum: Auslan as part of the Languages suite of curricula. This was reported positively. Media related to students with EAL/D focused on cultural diversity in schools.

Media, which related to gifted and talented students, included reports on:

- selective schools catering for the most advantaged students
- selective schools not being the best placement for gifted students
- accelerating students to higher grades (*The Conversation*, 13 October 2016)
- gifted and talented students being neglected by schools.

Most of the media that focused on students with disability referenced funding issues. The release of the 2017 Productivity Commission report was compared to the Nationally Consistent Collection of Data. The former counted funding, and the latter counted adjustments made. The reports focused on the disparity between the number of students requiring adjustments and actual funding received: the Productivity Commission reported 200,000 students received funding versus 469,000 students requiring adjustments. Other articles reported increases in student numbers and talked about the disability loading under the Gonski model of funding.

Other media included reports on the release of the Leading Learning 4 All online resource, a physical education resource developed by ParaQuad in Tasmania and Abilities Based Learning Education, Western Australia. One article in *The Age*, on 10 May 2017, related to a student with disability and NAPLAN, reporting that guidelines were changed in Victoria at the last minute to

allow students with dyslexia access to a laptop.

### *Enquiries*

The focus of most enquires was on providing advice and resources for teachers using the Australian Curriculum to support diverse learners. The appointment of a curriculum specialist: student diversity in April 2017 has enabled direct support for jurisdictions with advice and professional learning in relation to catering for the full range of learners.

In December 2016, ACARA published new illustrations of practice on how to use the general capabilities to support student diversity. These videos showed schools in the Australian Capital Territory, the Northern Territory and Tasmania. Further illustrations are planned for publication in December 2017. ACARA's Students with Disability Advisory Group (SWDAG) has been closely involved with providing feedback on new illustrations of practice with a focus on students with disability. This feedback has been highly positive.

ACARA presented as keynote speaker at the Australian Council for Educational Leaders National Disability Leadership Summit, 19–20 June 2017.

### *Google analytics*

The Student Diversity Advice Materials has attracted more pageviews than in the previous monitoring period, up 16 per cent overall, with most sections recording increased interest compared with 2015–16. The general advice page usage improved by 10.7 per cent. The EAL/D page, in particular, proved to be popular, showing an increase of over 34 per cent. There was very little increase of usage for students with disability page (up 1 per cent) and a decline in use of the advice for gifted and talented page (down 1.4 per cent).

### *Issues for consideration*

Internationally, personalising student learning is the approach used by many education authorities to meet the needs of diverse learners.

Similar to Australia, schools in the United Kingdom, Finland, Germany make decisions at the local (state/municipality) level on how the curriculum is implemented. Each use a robust approach to personalising student learning to meet the needs of every student. There is a strong reliance on the development and implementation of personalised education plans as a way of meeting the diverse needs of students' learning. There are high expectations that the differentiated strategies, used by teachers, include curriculum, instructional and environmental adjustments. Like in Australia, the development of personalised learning plans involves a collaborative process, with students and parents/carers being part of decisions informing learning goals. In each country, most students access the general curriculum. Special schools continue to operate in each of these countries. Some countries have specific curriculum guidelines for special schools.

## 8. Conclusion

The Australian Curriculum is being implemented across all states and territories in ways that

meet local contexts and requirements. Jurisdictions use the resources published on the Australian Curriculum website to support their implementation and have requested that ACARA maintain the currency, and expand the scope and coverage, of these documents.

The key findings from the 2016–17 monitoring period are:

- The cross-curriculum priorities as one of the three dimensions of the Australian Curriculum are supported.
- Whilst jurisdictions provide advice and support for the integration of the priorities in teaching and learning, there is some variability across schools and systems.
- Schools and teachers require more support and resources to assist their understanding of the priorities, in particular, the Aboriginal and Torres Strait Islander Histories and Cultures priority.
- Systems and schools use the resources of the Australian Curriculum in relation to gifted and talented students, students for whom English is an additional language or dialect and students with disability.
- Further resources, in particular, illustrations of practice, would enhance understanding of and support for student diversity.

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## Appendix A. Federal, state and territory curriculum and school authorities

ACT Education Directorate

Association of Independent Schools NSW

Association of Independent Schools South Australia

Australian Government Department of Education and Training

Catholic Education Commission of Victoria

Catholic Education Office South Australia

Department for Education and Child Development South Australia

Department of Education Tasmania

Department of Education Western Australia

Independent Schools Queensland

NSW Education Standards Authority

Queensland Catholic Education Commission

Queensland Curriculum and Assessment Authority

Queensland Department of Education and Training

School Curriculum and Standards Authority WA

Tasmanian Catholic Education Office

Victorian Curriculum and Assessment Authority