Queensland response to the draft senior secondary Australian Curriculum

July 2010

Queensland Government
Queensland Studies Authority

www.qsa.qld.edu.au
Queensland Studies Authority

Contents

Executive summary

The Queensland Studies Authority (QSA) in partnership with Education Queensland (EQ), Queensland Catholic Education Commission (QCEC) and Independent Schools Queensland (ISQ) appreciate the opportunity to provide feedback on the draft senior secondary Australian Curriculum for English, mathematics, science and history.

Queensland appreciates the depth and scope of the work to date and understands the challenges facing the Australian Curriculum, Assessment and Reporting Authority (ACARA). Queensland is positive and supportive of the notion of an Australian Curriculum that will provide consistent and explicit curriculum expectations across the nation.

Queensland's consultation on the content descriptions for the Australian Curriculum senior secondary courses identified strengths and a range of issues and concerns for ACARA's consideration when redrafting the content descriptions and developing the achievement standards.

Strengths

The QSA, EQ, QCEC and ISQ agree that the Phase 1 senior secondary courses show the following strengths:

- differentiated and specialised courses acknowledge that Year 11 and 12 students have varying learning interests and needs
- the content in the courses represents what is typically expected in senior secondary courses
- they generally align with current suite of senior courses offered in Queensland
- the potential to ensure there are high expectations for all students
- there is an attempt to include inquiry in science and history
- the inclusion of:
  - the strands "Human endeavour" in science and "Historical skills" in history
  - a Literature course in English
  - visual literacy in English
  - Aboriginal and Torres Strait Islander perspectives (however this could be embedded more deeply and sequenced more thoroughly)
- the potential to establish common understanding of concepts and terminology in subjects across Australia
- online format (although some advice will be presented regarding specific aspects of this).

Issues and concerns

The following key issues and concerns have been identified for consideration in the redrafting of the Phase 1 senior secondary Australian Curriculum courses.

Underpinning framework

The senior secondary Australian Curriculum courses are inconsistent in their technical form*, and hence lack coherence across and within the learning areas. This inconsistency extends to the use of terminology throughout the curriculum and the internal organisational structure of units and topics within and across learning areas.

Way forward

Revise or develop the conceptual frameworks for all learning areas to strengthen coherence across K(P)–12.

Inconsistent approach to the rationales

The rationales across all courses vary in their structure and are inconsistent in the way they are framed. Generally, they do not provide clarity about the purposes of the courses and their place in the senior curriculum. The *Shape of the Australian Curriculum* (May 2009) clearly states that the rationales will:

- describe the nature of the learning area in general terms and provide an outline of how learning in this area relates to the contemporary world and current practice
- explain the place and purpose of the learning area in the school curriculum and will explain how it contributes to meeting the goals in the national declaration
- provide teachers with a clear sense of the place of the learning area within the whole school curriculum.

The rationales should not describe the courses by narrow statements about future pathways. Some pathway statements imply hierarchy and greater status. Pathway statements should be more explicit about how the course of study prepares young people for work by making connections between the discipline and pathway.

Overall, the rationales do not fulfil the advice provided in the *Shape of the Australian Curriculum* or the *Curriculum Design* paper.

Way forward

Rewrite course rationales so that they:

- are consistent in the way they are constructed and follow the same structure in the points they address
- are audience-specific
- provide for the development of differentiated or specialised curriculums in the senior secondary years by including:
  - an overarching rationale that describes the discipline of the learning area, its key characteristics and attributes, and how it links to earlier and later learning and builds a K(P)–12 learning continuum
  - course-specific rationales that explain the place and purpose of each course in the learning area by clearly describing their educational goals and how they are either specialised or differentiated
  - descriptions of the characteristics of the phase of learning, and developmental issues of the diverse communities of learners to whom the courses will be taught (e.g. by gender, language, cultural background, age, location, special needs).

* "Technical form" refers to the conceptual structures and systems, the categories and taxonomies that are used in the courses to describe what should be taught and learned in schools (see Luke, Weir & Woods, 2008).

The purpose of the aims

The *Curriculum Design* paper states the purpose of the aims of the courses is to "identify the major learning that students will be able to demonstrate as a result of learning from the curriculum" (p. 16). This means that the aims should be more than a simple precis of the content and topics of a course, as is currently the case with many of the aims.

In many of the courses, the aims are uneven, and in some cases salient aspects are omitted, such as a literacy aim in Essential English.

In the senior secondary courses, the aims should provide the potential for establishing an alignment between what is taught and the achievement standards.

In their current form some aims for some of the courses would be difficult to assess, that is, difficult for students to demonstrate their learning. If the aims are not intended to be assessed, this needs to be made explicit.

Way forward

- The aims of the senior secondary courses should be rewritten to provide a structure that sets up the necessary alignment between what is expected to be taught, what is taught, what is assessed and what is reported. In this way the aims will inform the achievement standards.
- The aims should include common expectations across a learning area and specific aims for a course. This is a key equity consideration where differentiated and specialised courses are offered.
- The aims should reflect the key skills, processes and cognitions expected to be demonstrated in student learning.
- Reference to specific content within the aims of a course is redundant and should be removed.
- Any affective aims of a learning area need to be written as long-term goals, attitudes and values, and should match the aims set out in the relevant shape paper.

Continuity of the strands

The only conceptual structure in the Australian Curriculum is the concept of strands outlined in the shape papers. In the K(P)–10 curriculum, the strands are clearly used to identify the learning in each learning area that is expected to be developed over a year. In the senior secondary curriculum, the strands are inconsistently used in the construction of the courses across the learning areas.

This inconsistency shifts away from the directions in the shape papers and disrupts the learning continuum K(P)–12 by introducing a different construct to the K(P)–10 curriculum in the senior secondary curriculum.

For example:

- the science and history learning areas provide significant detail regarding the expected skills and processes to be developed in their strands, "Science inquiry skills" and "Historical skills"
- in K(P)–10 mathematics there are content strands and proficiency strands. In the senior secondary courses, these are replaced by the content descriptions, which supposedly embed the proficiencies of understanding, fluency, reasoning and problem solving
- in the senior secondary English courses, the strands "Language", "Literature" and "Literacy", are recast as "key elements".

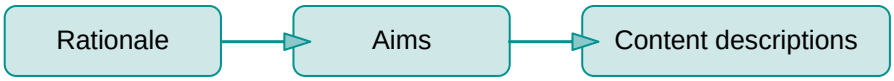
This is a significant issue that must be addressed. The different structures in K(P)–10 and Years 11–12 create a conceptual and structural disjuncture.

Way forward

Revise the senior courses as learning for a year, framed to make the continuity of the strands K(P)–12 obvious.

Linking rationales, aims and content descriptions

The logic of a course must be internally consistent and its individual parts must form a coherent whole. Specifically, the aims must follow logically from the rationale, and the content descriptions from the aims. This logic can be seen in the *Curriculum Design* paper and the learning area shape papers. Feedback from across Queensland suggests that this internal consistency has not been met across any of the senior secondary learning areas.



Way forward

- Revise the courses to ensure greater clarity and more direct relationships between the course rationales, aims and the content descriptions.
- Aim for alignment and greater consistency between the shape papers for each of the learning areas and the content descriptions for each of the courses.

Structure and organisation of the courses

A key feature of the curriculum documents used in countries which have high quality and high equity educational outcomes is the balance of prescription and teacher professional judgment. The draft senior secondary Australian Curriculum does not have the balance right.

Inflexible unitised structure

The senior secondary courses are structured as four units of approximately 50–60 hours. These semester units artificially fracture the courses and create unnecessary inflexibility. This inflexibility limits teachers' ability to use their professional skills — skills which are valued in Queensland, and that allow for a diversity of approaches to curriculum and pedagogy, allowing teachers to develop programs and practices that provide the best possible outcomes for their cohorts of students.

With the exception of the histories, the senior secondary courses are overly prescriptive. This is an unnecessary and inequitable treatment of the learning areas. The histories include some choice regarding the content to be covered and the contexts for a unit, giving teachers scope to exercise their professional judgment by selecting specific events, societies or themes for study.

English gives some choice through text selection, but the suggestion of a prescribed list of texts in Units 3 and 4 will seriously constrict teacher professional judgment.

By contrast, the mathematics and science courses offer little choice. They are in essence a list of content to be covered over the two-year course. In the science courses, the only flexibility is the suggested investigations within the "Science inquiry skills" strand. The only flexibility in the mathematics courses is the choice of investigations in Essential Mathematics, and the optional topic in Unit 4 of Specialist Mathematics.

This is a serious concern, given that research has identified that in the senior phase of learning there must be a balance of flexibility and prescription if systems are to engage and retain students to Year 12 completion.[†]

The unitised structure of the senior secondary courses will limit the flexibility in how courses are delivered, a flexibility supported in Queensland's current system of externally moderated school-based assessment. This is a significant issue in all the courses.

Composite classes

Composite classes are common in small, often remote Queensland schools. Currently, senior secondary syllabuses in Queensland provide advice on organising curriculum for composite classes that is based on teaching common content and differentiating processes and assessment for Year 11 and 12. Managing the curriculum in composite classes will be a major issue with the unitised structure of the senior secondary curriculum.

- A required sequential unit structure will have significant implications for the operation of composite classes.
- School-based responses to student needs will be adversely affected with mandated sequencing of units.
- Teachers' capacity to organise programs and contextualise units for student clientele will be limited.

Unit 4

Unit 4 will be the final unit of the senior secondary courses. In its current form, this unit will be problematic across all courses.

- Unit 4 introduces too much new content. Any course of study should end by connecting the knowledge and skills learned throughout the course in a culminating unit or activity. The content descriptions in Units 1, 2 and 3 should be applied in greater depth and sophistication, and in new ways in Unit 4. There should be minimal introduction of new content.
- Unit 4 will occur in semester 2 of Year 12. This is typically the shortest semester for the senior courses due to end-of-school processes. There is far too much content in Unit 4 in all the courses.

Articulation between courses in a learning area

- The unitised structure suggests the potential for flexibility with multiple entry and exit points. This is particularly suggested in the English courses with the use of the same title for each unit in each course.
- In mathematics, students can do Unit 3 having not studied mathematics in the senior years or can move from General Mathematics; students who have done Mathematical Methods Units 1 and 2 can move to Specialist Mathematics in Unit 3.
- While articulation between courses looks possible from this structure there is no clarity about common knowledge and understanding that would set young people up for success should they choose to change courses after Unit 1, 2 or 3.

[†] See for example, Professor Michael Young (1998), *The Curriculum of the Future*, Farmer Press, UK. See also the year-long courses developed by the Ontario Ministry of Education which set clear expectations but allow flexibility about how they are to be delivered.

Way forward

- Continue the structure of the K(P)–10 Curriculum by providing content descriptions for a year-long course, providing teachers with greater scope and flexibility about how they structure what they teach and assess.
- Revise course organisation to show how:
  - key concepts are addressed across the strands and the two-year course
  - the strands connect, that is "all strands are of equal importance"
  - each unit is more developmentally challenging.
- Reduce the core content in order to provide enough time for teachers to delve more deeply into a topic, or incorporate optional content that suits their students' needs. See course-specific suggestions in the relevant sections.
- Revise the curriculum to include clear conceptual statements that underpin the courses and allow the progressive development of concepts across the two years of study. This will support schools that offer composite classes.
- Revise Unit 4 for all the senior secondary courses to significantly reduce the content, removing as much new content as possible.
- Rewrite Unit 4 for all the senior secondary courses to be a culminating unit that brings together learnings and understandings from the three previous units. This does not preclude the content being studied to a greater depth.
- Identify the common knowledge and understanding that would support students moving from one course to another in the learning area.
- Provide clear guidelines for progression and movement between courses in the preamble to each learning area.

Depth vs. breadth

The *Shape of the Australian Curriculum* made explicit that depth of understanding was preferred over breadth (p. 10). The draft senior secondary curriculum has not met this goal. All the courses are content-heavy and would not be able to be taught in the nominal times allocated by the curriculum writers. The intended focus on inquiry seen in much of the curriculum, while a strength, only serves to reinforce the major problem posed by too much content. This is particularly an issue in Unit 4, which is typically shorter due to end-of-school processes.

Much feedback noted that units within courses simply read as a list of prescriptive content to be covered in a semester. This will be disengaging for students. These units do not have a sense of purpose or provide a "big idea". This is most noticeable in the sciences. The *Shape of the Australian Curriculum: Science*, specifically refers to Understanding by Design as the favoured curriculum planning framework. This framework begins by asking what the "big idea" of a unit is. The purpose of this is to engage student interest in a subject.

Way forward

- Reduce the core content in order to provide enough time for teachers to delve more deeply into a topic, or incorporate optional content that can be selected to suit students' needs, and be more engaging. See course-specific suggestions in the relevant sections.
- Write an introductory paragraph for each unit that does more than summarise the content of the unit. Clarify the purpose of the unit, the big ideas it addresses and the enduring understandings with which students should engage.

Content of the courses

Parallel structure

Content specificity is to be commended, as it clearly identifies what is to be taught. However, the content descriptions within the courses are inconsistent in their construction and depth. They often do not adhere to parallel form, and range from overly fine-grained narrow statements of content to generalised overarching statements. Such variations mean that any real indication of intended depth is lost. Examples of this are provided in the course commentaries.

The content descriptions are described in different ways. For example, in Physics Unit 1, all the science understandings are referred to as concepts and facts, devoid of any context. The one exception to this is the content description relating to the use of household wiring. Thus we have a science understanding that specifies a context. This frequent mismatch of content and context means the curriculum strands lack coherence.

Way forward

- Rewrite content descriptions so that they are consistent in their depth or are of the same order and adhere to a parallel form.
- Ensure the descriptions within a strand clearly describe content specific to that strand. That is, directly related to that strand and not another.

Thinking skills and cognition

The way in which thinking skills and cognition are described in the content descriptions between courses is inconsistent. In science and history, thinking skills and cognition are delivered through the inquiry strands. Verbs such as “applying”, “analysing”, “evaluating”, “comparing” and “interpreting” are used and follow an inquiry process. The content descriptions are written in an order that will guide student thinking. Further, they are descriptions that can be applied to the range of content descriptions in the other strands.

In English, the highest thinking skill is “analysis”. In the main, bland verbs such as “explore” or “use” are randomly used through the course.

In mathematics, the thinking skills are intended to be embedded in the content descriptions as the proficiencies.

This raises the question: how are thinking skills to be developed in the Australian Curriculum courses? The language related to higher order conceptual thinking in these courses, most noticeably in English and mathematics, is low-level and inadequate. Further, the increasing rigour of thinking skills that should be developed over four sequential units is not evident.

A concern is that the current focus of the Australian Curriculum is on developing specific content for senior courses that can be applied to external exams. This will limit the flexibility for teachers in Queensland to develop learning experiences appropriate for their students.

Way forward

- Clarify the developmental and continuous learning processes that underpin the nature of the courses and each unit within the courses.
- Identify and consistently develop the key thinking skills and cognition of a course.
- Develop content descriptions that provide an overarching hierarchy of key concepts and ideas that will allow flexibility in delivery through a variety of work programs, assessment and criteria for making judgments about grades.

Linking content descriptions, general capabilities and cross-curriculum dimensions

In practice, the general capabilities and cross-curriculum dimensions will be delivered through teaching and learning in the classroom. While attempts have been made to embed these in the curriculum, the links to the content descriptions are generally not clear. Limited advice on how general capabilities are to be taught within each course of study is provided.

General capabilities

Information and communications technology (ICT) is a good example of this and could be better developed. ICT is specifically mentioned in the *Shape of the Australian Curriculum* as a general capability providing a pathway to acquiring understanding of concepts and integrating ICT skill acquisition. While on occasion specific ICT is identified within the content descriptions (e.g. remote sensing technologies in Biology), often the use of ICT simply refers to "the use of ICT where appropriate", or "using appropriate technology".

There are examples of content descriptions that are identified as "developing ICT general capabilities" that make no reference to ICT. For example, in Essential Mathematics, "living away from home, e.g. renting and its expenses", is identified as an ICT general capability. This could be strengthened if the specific ICT, for example, "using a spreadsheet or similar application", was identified or proposed as an ICT approach to this content.

In Ancient History, statements such as "the Mauryan dynasty in India 321–185 BCE (Ashoka)"[‡] make no reference to a specific ICT yet are highlighted as ICT general capabilities.

The *Shape of the Australian Curriculum* specifically states that "aspects of ICT competence are as much about information management as about the use of technology" (p. 12). That is, ICT as a general capability requires students to be able to evaluate information reliably. This aspect of ICT does not appear anywhere in the content descriptions of any of the senior secondary Australian Curriculum courses. The closest a content description comes to this is in Modern History with, "identify and locate relevant historical sources, using ICT and other methods". Yet even here the opportunity to have students "evaluate the source, reliability, accuracy and validity of information" as stated in the *Shape of the Australian Curriculum* (p. 12) is missed.

Cross-curriculum dimensions

The decision to omit the explicit teaching of cross-curriculum dimensions from the K(P)–12 mathematics curriculum clearly demonstrates these are not cross-curriculum dimensions. This is further emphasised in the senior English courses where they are reduced to being learned though the "study of texts". That being said, where the cross-curriculum dimensions remain, there is limited guidance in content descriptions to support their teaching. They are not well defined, inclusive, or capable of being localised. They are often inconsistent in their description.

Way forward

- Review and strengthen the content descriptions in each course, checking that they are linked to the general capabilities and cross-curriculum dimensions.
- Effectively connect cross curriculum dimensions with the discipline (and content descriptions).

[‡] If this is a valid ICT statement, why isn't "Qin and Han China 240 BCE–220 CE (Qin Shihuangdi)" highlighted as an ICT capability too?

- Review the filters related to the general capabilities so that there is more consistent application.
- Provide a developmental continuum of the general capabilities, particularly thinking skills, within and across learning areas. For effective teaching of the general capabilities to occur, such a scope and sequence or other advice is needed.

Provision of a curriculum glossary

Many of the terms that are used in the courses are ambiguous or are used differently in different states and territories across Australia. A curriculum glossary is necessary and will be an excellent means of developing teachers' shared understanding of terms across and within learning areas.

Website

- Many felt that in its current form the digital layout did not offer anything a paper document did not offer.
- Some felt that print versions would still be needed. This raises the question about what would be included in a print document given the dual roles of ACARA and state authorities.

Way forward

Revisit website design, focusing on how teachers will use the site when they are designing units of study, for example:

- availability of curriculum in Microsoft Word format
- facility to bookmark particular elements and be able to navigate easily and quickly
- ability to look at more than one page at a time
- capacity to see aspects within a course and across courses side-by-side
- capacity to compare one year level to the next by the selection of key information, allowing teachers to see what students have already done and where their learning is heading. That is, a real K(P)–12 framework.

Standards

The absence of achievement standards in the draft senior secondary Australian Curriculum was consistently raised as a concern. Feedback noted that achievement standards are a significant element in a curriculum document, and that they do not exist separately. Without achievement standards, the depth of expected learning in a course is unclear.

The following advice on achievement standards is provided for consideration.

In a system using standards-based assessment, judgments about the quality of student achievement are made with reference to predefined standards that describe how well students have achieved the objectives in a course. Predefined standards ensure that:

- students and teachers know what is expected for each level of achievement and can work together to achieve the best result for the student
- comparability from school to school can be achieved
- teachers can discuss standards with parents/carers when reporting a student's achievements.

Way forward

- Develop achievement standards in all courses that are aligned to the aims and the content.
- Ensure the achievement standards describe evidence in student work, identifying a descriptor (such as "clarity") and a qualifier (such as "considerable").

1. Introduction

The Queensland Studies Authority (QSA) in partnership with Education Queensland (EQ), Queensland Catholic Education Commission (QCEC) and Independent Schools Queensland (ISQ) appreciate the opportunity to provide feedback on the draft senior secondary Australian Curriculum for English, mathematics, science and history.

Queensland appreciates the depth and scope of the work to date and understands the challenges facing the Australian Curriculum, Assessment and Reporting Authority (ACARA). Queensland is positive and supportive of the notion of an Australian Curriculum that will provide consistent and explicit curriculum expectations across the nation.

This paper provides a summary of the collated Queensland feedback from:

- national forums
- state focus sessions
- representative committees of the QSA
- QSA mapping activities with staff teams
- the three school sectors, representing and advocating for 1400 Education Queensland schools, 288 Catholic schools and 188 Independent schools.

QSA, EQ, QCEC and ISQ recognise the challenge of creating an Australian Curriculum and have aimed to provide critical commentary with associated solutions. This paper is structured in the following way:

- an executive summary summarising strengths, issues and concerns
- an analysis of each key learning area, with course-specific feedback
- for each section of the paper, a “way forward” is provided.

2. English

This section summarises feedback and recommendations for the four English courses.

2.1 Overall comments

Strengths

The following were identified as strengths in the draft content descriptions in all four English courses:

- the development of four courses acknowledges that Year 11 and 12 students have varying learning interests and needs, and gives students the potential to study more than one English course
- the content included in the four courses includes what would be expected in a Year 11 and 12 English curriculum, and the identified content for the English courses of study is supported
- the use of a common structure across all courses creates the potential for common expectations, which is a key equity consideration
- the structure suggests the potential for flexibility and multiple entry and exit points (however, how the articulation between courses would actually work in a school is difficult to visualise)
- the courses create the potential to establish common understandings of concepts and terminology in the English curriculum across Australia.

Issues and concerns

Issues and concerns consistently raised about all four courses in senior secondary English are summarised below.

- There is no underpinning framework describing what the learning area and the courses within the learning area are about, and how the four courses are related. The English courses need a framework that reflects the underlying discipline of English, for example, Text–context model or Functional language model.
- The content of the rationales is disappointing, and they provide inconsistent information about each of the four courses.
- It is hard to see how the aims support “students’ growing understanding and use of English”. The defined aims for each of the four senior secondary English courses:
  - show no relationship to the strands
  - do not set up a learning continuum with the K(P)–10 curriculum
  - do not set up equal expectations for students in the senior phase of learning, e.g. the aim, “to develop English skills for lifelong enjoyment and learning” is not evident.
- The use of carefully crafted aims in the senior secondary courses could provide a structure that sets up the necessary alignment between what is expected to be taught, what is taught, what is assessed and what is reported. In this way, the aims could inform the achievement standards.

- English is taught as a “holistic” subject and this needs to be reflected in the structure and organisation of the course. English is about language, texts and contexts and as such, all units in the course should include study of representations, making connections and perspectives.
- The senior secondary English courses do not structurally or conceptually build on the K(P)–10 curriculum; there is no sense of coherence across K(P)–12. The structure and organisation of the senior courses differ in the following ways:
  - the three strands that form the organisational framework in K(P)–10 are not evident
  - the strands are renamed as “key elements” but how the key elements (or strands) are incorporated in courses or content descriptions is not clear
  - the content descriptions in K(P)–10 are described for each year level, but the flexibility this enables is lost in senior courses, which describe units that would be covered over 50–60 hours, typically a semester.
- The division of the courses into four units (Unit 1 — Language, texts and content; Unit 2 — Representation; Unit 3 — Making connections; and Unit 4 — Perspectives) does not show an understanding of the way English teachers work with texts and language. English courses currently taught in schools cover all four broad focus areas in every unit over a two-year course of study. The study of language, texts and contexts includes what has been arbitrarily separated into four discrete units (Units 2, 3 and 4).
- Generally there is too much content in each unit. In particular, the introduction of so much new content in Unit 4 is unrealistic given the end-of-school processes.
- The content descriptions do not provide clarity for teachers about what young people are expected to know and be able to do as a result of working through four units.
- Some content descriptions using words such as “create”, “research a topic”, “select”, “present”, “adapt” and “evaluate a preferred genre” are implied assessment.
- Prescription of textbooks is not a part of current educational culture or practice in Queensland. Instead, schools have been entrusted to select their own texts within the guidelines of the syllabus.
- The content descriptions must be accompanied by a glossary of terms, as there is currently no shared understanding of key terms across states and territories (no metalanguage).
- Cross-curriculum dimensions are not explicitly identified in the content descriptions of senior secondary English (unlike K(P)–10). Students are to develop their knowledge and understanding through the study of texts. As a consequence, the cross-curriculum dimensions are not well defined or related to the discipline of English and the consistent teaching of them is unlikely to occur.
- A senior curriculum becomes purposeless without a clear statement of objectives of learning and clear descriptors of standards for achievement levels. While the states have responsibility for assessment and reporting, there needs to be an agreed understanding about what constitutes standards and expectations for A–E standards.

Way forward

- Provide a framework that underpins the English course so that all its parts — key elements (strands), broad focus areas, units and content descriptions — are integrated and cohesively linked.
- Develop a coherent K(P)–12 curriculum.
- Reshape content as year-long courses and make the strands explicit.

- Revise the aims so that they reflect the aims outlined in the English Shape Paper, and are crafted to include common aims for all students of English (such as literacy expectations) and specific aims that reflect the essence of the differentiation of each course. Two approaches are suggested in the "Way forward" on page 21.
- Include a rationale for the learning area as a whole that aligns the senior secondary course with the K(P)–10 English curriculum and shows how the Year 10 course articulates to the senior secondary courses, and rationales for each course that clarify what is common and what is differentiated.
- Revise content organisers to identify threads through the courses, and rework the dot points under each organiser to clearly identify the essential knowledge, skills and processes.
- Define a core of knowledge and understanding for all students in the learning area, and make it explicit in each unit.
- Consider providing elaborations that can be used differently according to state- and territory-based requirements. For example, states with external exams might require greater specificity, and elaborations could provide this extra layer of prescription. For states with school-based assessment, the elaborations could serve as useful suggestions for expanding content, especially for teachers teaching outside their area of specialisation.
- Provide explicit guidance to support the teaching of each cross-curriculum dimension.

2.2 Rationales and aims of the courses

Rationales

Consistent feedback expressed disappointment with the content of the rationales for all courses, and the need for consistent information in the rationale for each of the four courses. Other points raised are listed below.

- Concerns were expressed that the courses are presented as a hierarchy rather than as differentiated courses. The way the courses are described seemed to some participants to be streaming, and this was felt to be inappropriate in the senior phase of learning. Instead, the rationale for each course should explain how the courses are similar and where they differ.
- The rationales are more like lists of skills or content descriptions rather than about learning English.
- Each course rationale should be clear about the expected student clientele.
- Rationales should not:
  - describe subject English as a "service" subject — a subject in which students learn knowledge and skills needed to do well in other subjects
  - focus on potential destinations, e.g. the rationale for Essential English should not have a narrow focus on the workforce.
- The intent of the rationale and aims should be realised in content descriptions, and the key elements should be aligned with the rationale of the course.
- Specific issues raised about the EAL rationale included the need for clarification about:
  - eligibility requirements — long-term migrant students with very restricted English may not meet the eligibility requirements to study EAL
  - the definition of the term "Standard Australian English"
  - pathways to further education and training.

- Specific issues raised about the Essential English rationale included that the course seems to be aimed at a very specific student group who have previously struggled with or disengaged from English but require it for employment. There is a concern that the rationale is written with a deficit view of students.

Way forward

- Include an overarching rationale for the K(P)–12 English learning area that provides a rationale for studying the learning area as well as the relationship with K(P)–10 and the development from Year 10.
- The overarching rationale should answer these questions:
  - What is the learning area, English?
    Provide a clear description of the nature of the subject area, which has as its focus, making meaning through engagement with a broad range of texts and understanding language through active creative, analytical, critical, imaginative and speculative engagement with language across and through language modes.
  - What are the educational goals of the learning area, English?
    Include why English is important in the 21st century and how English is central to students' learning through its emphasis on critical thinking that promotes active and reflective citizenship. Define the place of the general capabilities and cross-curriculum dimensions and how they fit and work in the subject.
  - Who are the students served by the learning area, English?
    Include any prerequisite knowledge and understanding, and explain why there is a range of courses in the English learning area — three differentiated courses and one specialised course. This is consistent with the English Shape Paper, which states that in developing the curriculum (both content and achievement standards) should consider the characteristics of learners.
- Complement the overarching rationale with course-specific rationales that present the case for the specific course and clearly articulate how the courses differ from each other. For each course, they should follow a similar pattern:
  - the nature of the course
  - the educational goals of the course, including any prerequisite knowledge and understanding and the status of the course with reference to tertiary pathways
  - the students expected to take the course.
- Clarify information about articulation between courses.
- Define the term "Standard Australian English" for consistency across Australia.
- Clarify the intended students for the Essential English course.
- In the EAL course rationale, change "eligibility requirements" to "eligibility guidelines" to provide some flexibility for school-based decision making. Further, to ensure that Indigenous students and Pacifika students are eligible:
  - remove the reference to seven years of residency, or clarify the term "residency"
  - change "English" to "Standard Australian English"
  - change "major language of communication or instruction" to "major language of communication and instruction" so that it addresses the significant issue of students who do not have "school-based language" proficiency
  - Include English proficiency measures.

Aims

Table 1 on page 19 maps the draft aims of the four senior secondary English courses against the expectations set out in the English Shape Paper. The mapping shows that the expectations are uneven or absent and it is hard to see how the courses, as a suite of learning, "support students' growing understanding and use of English" as stated in the English Shape Paper. The current aims for each of the four senior secondary English courses:

- show no relationship to the strands
- do not set up a learning continuum with the K(P)–10 curriculum, which uses the strands — literacy, language and literature — as the organisers to articulate what students are expected to know and be able to do to demonstrate their growing understanding and use of English
- do not set up equal expectations for students in the senior phase of learning, for example:
  - there are no aims regarding literature in Essential English and EAL
  - there are no aims regarding literacy, accuracy and fluency in Essential English and Literature
  - the aims about language and how it works are included in all courses but there is no common expectation for all students to, for example, use language creatively or critically
  - the verbs used in the aims do not set a goal for higher order thinking but focus on "develop" and "use". In the English course, "appreciate" rather than "enjoy" would reflect the importance of higher order thinking
  - the aim to work independently, which is appropriate for all students in the senior phase of learning, is only in English and Literature
  - the aim to develop English skills for lifelong enjoyment and learning is not evident.

There should be aims that are common across all courses — that is, aims for all students who are studying English in the senior phase of learning. The common aims should then be complemented with aims that reflect the different focus of the course made evident in the rationales and which create the differentiation.

The use of carefully crafted aims in the senior secondary courses provide a structure that potentially sets up the necessary alignment between what is expected to be taught, what is taught, what is assessed and what is reported. In this way the aims could inform the achievement standards.

Table 1: Senior secondary English courses mapped against the English Shape Paper

Shape Paper	Essential English	English	EAL	Literature
Literacy: Application of English skills and knowledge to listen, view, read, speak, write and create a growing repertoire of texts				
Growing a repertoire of English usage: the ability to understand and produce the English language accurately, fluently, creatively, critically, confidently and effectively in a range of modes and digital and print settings, in texts designed for a range of purposes and audiences.		Develop accuracy and fluency in writing, reading, speaking, listening, viewing and creating texts for a range of purposes and audiences.	Accuracy and fluency in comprehension and expression.	
Language: Knowledge about the English language and how it works				
Knowing about the English language: a coherent, dynamic, and evolving body of knowledge about the English language and how it works.	Use language effectively, contextually, creatively and analytically for different purposes.			
	Extend their understanding of language, themselves and their world and apply their acquired skills to real and practical daily life and workplace situations.		Knowledge of the relationship between language, texts and ways of thinking, knowing and learning in Standard Australian English.	
	Develop skills in the areas of research, planning, reflecting and evaluating.	Develop proficiency in critical analysis and reflection.	Higher order cognition and deep comprehension, including inferential and critical thinking and critical use of Standard Australian English.	Logically analyse texts, synthesising a range of critical perspectives into their own interpretation.

Shape Paper	Essential English	English	EAL	Literature
Literature: Interpret, appreciate, evaluate and create literacy texts				
Understanding, appreciating, responding to, analysing and creating literature: an enjoyment in, and informed appreciation of, how English language can convey information and emotion, create imaginative worlds and aesthetic and other significant experiences.		Understand, evaluate and enjoy different creative processes and use a range of language and textual forms in their own texts.		Respond personally and imaginatively to a wide range of literary texts drawn from a variety of contexts.
				Reflect on the different ways texts may be read and valued.
				Produce sustained imaginative and analytical print, spoken, multimodal and digital texts.
The learner in the senior phase of learning				
		Work independently and collaboratively to produce sustained critical, interpretative, persuasive and imaginative texts in a range of modes.		Conduct independent inquiry.

Way forward

- Revise the aims so that they reflect the aims outlined in the English Shape Paper, and are crafted to include common aims for all students of English and specific aims that reflect the essence of the differentiation of each course. Two approaches which would add consistency and alignment with the aims in the English Shape Paper are given here.
  - Approach A — this approach would include aims for all courses about:
    - literacy — application of English skills
    - language — knowledge about the English language and how it works
    - literature — interpretation, appreciation, evaluation and creation literacy texts
    - independent learning
  - Approach B — this approach would be to frame the aims using a cognition framework that relates to language, literacy and literature expressed in terms of:
    - knowledge and understanding
    - application and analysis
    - synthesis and evaluation
    - independent learning.
- Ensure that the aims are realised in the course content.

2.3 Structure and organisation of the courses

English is taught "holistically" and this needs to be reflected in the structure and organisation of the course. English is about language, texts and contexts and as such, all units in the course should include study of representations, making connections and perspectives.

The construct of the courses needs further work to make it a workable and understandable document that teachers can use, and that promotes clarity of the expectations.

Specific issues and concerns identified about the structure and organisation of the four senior English courses are detailed below.

Coherence K(P)–12

- The senior secondary English courses do not structurally or conceptually build on the K(P)–10 curriculum; there is no sense of coherence with K(P)–12. The structure and organisation differs from K(P)–10 in the following ways:
  - the three strands that form the organisational framework in K(P)–10 are not evident in the senior courses
  - the strands are renamed as "key elements" but how the key elements (or strands) are incorporated in courses or content descriptions is very unclear
  - the content descriptions in K(P)–10 are described for each year but the flexibility this enables is lost in senior courses that describe units that would be covered over 50–60 hours, typically a semester.

Language framework

- The draft Year 11–12 Australian Curriculum for English has no overarching framework or model of language. This represents changed practice for Queensland teachers of English who are accustomed to working with the Text–context model or Functional language model (which have underpinned Queensland English syllabuses since 1986).

Unitised structure

- Each English course is made up of four units. The titles of the units suggest a discrete aspect to be taught. However, the aspects of English represented in the titles of the units would not be taught discretely. For example, *Language, texts and contexts* is an overarching concept within which *Representations, Making Connections* and *Perspectives* are typically taught.
- The organisation of the content is not clear or logical. This structure sets up each English course as a set of silos. The units are not complementary, sequential or developmental. It is not clear how students build on their knowledge throughout the course.
- While unit titles have common names across the four courses, the way each course presents the focus varies greatly so the potential of using this common nomenclature is not realised.
- The differentiation between the courses and how the units relate to each other is not clear.
- The unitised approach is unlikely to create any flexibility in reality and has the disadvantage of creating real disjointedness and disjuncture in English as a school subject.

Organisers within units

- The construct of the organisers which include a statement followed by a series of dot points used in the documents is not explained or defined to assist the readability of the document.
- The preamble to each course includes the section on “Curriculum Content” but this does not explain what the main statement is and what the relationship is between the main statement and the dot points.
- The introductory statements do not include a stem, such as “By the end of this unit students will …”
- The verb at the beginning of each organiser is often low level or vague, for example, “explore” or “develop”. There is no development across the four semesters. Table 2 below summarises the key word in each organiser in the English course.

Table 2: Key words in organisers for the English course

Unit 1	Unit 2	Unit 3	Unit 4
review, refine and develop knowledge and understanding	explore and analyse	explore	develop
analyse	analyse	analyse	analyse
assess	explore	present	explore
use	analyse	analyse	use
use	use	make	create
develop	explore	respond	

Key elements

- The key elements (formerly the strands) are included in all the senior secondary English courses. How they are related to the courses is unclear.
- The dot points for each key element are a muddle of knowledge, understanding, processes, skills and implied assessment tasks that duplicate or add to course content. For example:
  - some are implied tasks, such as “create sustained, well-crafted, engaging literary texts” or “adapt literary texts …”, which are key elements but are not in the course content of Essential English and EAL
  - some are duplicated in some courses
  - some add to the content descriptions, for example, in Essential English and EAL “appreciate the different ways literary texts may be interpreted” is a key element but is not included in the course content.
- The purpose of the key elements must be clarified.

Preamble to each course

- The introductory statements for the learning area are unclear about:
  - eligibility guidelines (if appropriate)
  - progression and movement between courses and how it is envisaged that students will be able to move seamlessly between courses. For example, it is difficult to see that a student doing Units 1–2 in Essential English would move to Units 3–4 of English or EAL or Literature as there is no clarity about common knowledge and understanding — just common unit titles. Advice on students transitioning from one English course to another is needed
  - advice on concurrent study of English courses, for example, whether content is duplicated or incompatible
  - progression within the course, for example, must units be delivered in the set sequence Units 1, 2, 3 then 4, or could units be reordered, that is Unit 1 followed by Unit 3 and so on.

The diagram

- The flow chart on the introductory pages which attempts to show the structure and relationships of the Year 11 and 12 courses in the English learning area is unhelpful in the following ways:
  - it introduces a new concept, “key elements” which is in effect the strands but the position of literacy, literature and language is not shown
  - it includes a heading “content descriptions” with three subheadings: “linguistic resources”, “textual response” and “production”, which suggests that these will form subheadings in the content descriptions, however they are not related to anything else in the document (or the shape paper)
  - it is not related to an overarching statement in a rationale for the learning area that could explain what the relationships might be
  - it does not show how the units in the courses work together.

- The issue of composite classes, that is teaching Years 11 and 12 simultaneously, was raised as a concern given the unitised organisation of the courses. Sequential units of work will have significant implications for the operation of composite classes which are common in small, often remote Queensland schools. A list of prescribed texts for Year 12 will affect the operation of composite classes.
- Many commented on the readability of the courses and suggested a Plain English edit and clarification of terms (see section on glossary).

Way forward

- Use the same technical form as the K(P)–10 curriculum, that is use the strands and frame the courses as year-long courses. While the structure of the K(P)–10 content descriptions using the three strands — language, literature and literacy — has its problems, it is a better way of organising the content than the lists in the senior courses. Content descriptions for a year-long course provide teachers with greater scope and flexibility about what they are able to teach and assess.
- If the current four-unit structure is maintained then:
  - include a model of language that shows how the focus of each unit exemplifies the model and relates to other units that make up the course
  - make the strands more obvious in the courses. The strands are a type of framework and are in the English Shape Paper
  - build the units so that Units 1–2 are revisited in greater complexity and sophistication in Units 3–4 with Unit 4 a culminating unit that brings together learnings and understandings from the three previous units rather than introducing a new concept. The developmental nature of the courses should show increasing complexity about how language operates in text rather than studying harder texts
  - include in each unit a statement of intent, for example: “By the end of the first unit, students should …”.
- Use threads as organisers consistently within units as is being done in the revision of the K(P)–10 content descriptions. The organisers in each unit need to identify the key expectations. The dot points under the key expectation should clearly identify the group of specific expectations to be covered. Possible organisers could be:
  - text types
  - conceptual understandings
  - genre.
- The use of four sequential semester units addressing similar concepts (although in different contexts and with differing emphases) potentially sets up common expectations and flexibility for students moving between courses. However, each course needs to:
  - identify understandings common to each unit
  - explain how the focus changes in each unit
  - integrate the key elements (strands)
  - connect the units.
- Redevelop the flow chart using consistent terminology to show the framework and how courses relate, for example, showing what is common in all courses and what is course-specific.
- Include the flow chart in an overview for the English learning area before any information about specific courses is provided.
- Include in the overview an example of a section from the course content that explains what each heading means.

2.4 Content of the courses

- Generally, there is too much content in each unit. In particular, the content in Unit 4 is unrealistic given the end-of-school processes.
- The content descriptions should provide clarity for teachers in any school about what is the essential knowledge, understandings and skills. However, the current draft is unclear about what exactly young people are expected to know and be able to do.
- The content descriptions resemble a checklist, and include a muddle of:
  - student outcomes
  - objectives
  - capabilities
  - implied assessment tasks.
- The key elements are not embedded in the content descriptions.
- There is inadequate attention given to higher order thinking skills.
- Using terms to categorise the range of texts by "critical, interpretative, persuasive and imaginative" does not represent the range of texts that would typically be used with students, for example, reflective texts. If there is a need to set up the range of categories then it must cover all the types, genres or purposes of texts.
- If categories are used they need to be of the same order, that is, all general terms such as satire or all specific terms such as parody. If requiring a study of narrative, what specific aspects of narrative must be included.

Way forward

- Clarify what students must know and be able to do — what knowledge about English is required to be taught in unit. This could be focused using threads or terms such as knowledge, skills, processes to organise the content.
- Identify a core of knowledge and understanding for all students in the learning area, English and make this explicit in each unit in each course.
- Map the units against each other to identify overlap and duplication.
- Provide guidance about the depth of treatment.
- Use parallel structure in the content descriptions and ensure that the dot points are of the same order of specificity.

2.4.1 Essential English

- Concerns were raised that the content and skills to be addressed may not match the ability or interest level of the students likely to undertake this course. Others applauded the inclusion of "research" and validating information (checking facts) especially in digital texts.
- The content in general builds upon K(P)–10 (although there are some content descriptions in the Year 10 course that are more challenging than the senior course).
- Many commented that there was an overemphasis on workplace contexts and that this emphasis does not align with the rationale. There is limited attention to cultural/social aspects of English, including visual literacy, creativity, aesthetics and imagination. In addition, opportunities to include the cross-curriculum dimensions are limited.

- Generally, there is too much content, the focus for the units is unclear and there is not enough clarity about what is essential. For example, in Unit 1, the content is crowded and the range of text types will encourage superficial treatment (some 15 text-types). Unit 4 is inappropriate as there is a false fit with genre — a focus on issues in texts would be better.
- In Unit 1 the strategies identified for comprehending and communicating effectively are considered most worthwhile.
- The course overview focuses on "literacy and language skills that enable effective participation in the workforce" but the content seems to demand much more.
- The suggested texts do not align with the rationale and aims of the course. Texts for students in this course should focus on contemporary literary texts and non-literary or everyday texts to engage students.
- Concerns were raised about the number of tasks implied in the content descriptions, for example, content descriptions that begin with "create", "research a topic", "select and evaluate a preferred genre", "present".
- Content that is missing includes:
  - oral competence
  - aesthetic appreciation of texts
  - technology that shows language in real purposeful and authentic contexts.

Way forward

- Revise the course to ensure it is a study of language and texts, and develops effective literacy skills that will provide effective participation in social, civic and community life, further education and training and the workforce. The focus must be on students using language effectively, contextually, creatively and analytically for different purposes and audiences in real and practical daily life and workplace situations.
- Use contemporary and popular texts to match the interests of students likely to be undertaking this course.
- Remove unit titles, as they do not clarify the focus for each unit.
- Revise the course organisation to:
  - ensure each course is balanced and meets the learning needs of its clientele
  - show more clearly how it addresses the needs and interests of its clientele
  - provide guidance on the interrelatedness of the major concepts and strands
  - address learning about literature rather than just providing a list of texts
  - reconsider the use and appropriateness of course organisers and use threads such as are being used to revise the K(P)–10 curriculum to provide a workable description of the content. For example, relationships, strategies, structures, forms and features, and text types
  - be more inclusive of the place of technology and the use of ICTs
  - re-balance the focuses on workplace and increasing understanding of cultural heritage.
- Revise content descriptions that are implied assessment. For example, rather than "research a topic", have "Develop and apply research skills including: formulate a research question, identify relevant sources of information".

2.4.2 English

- The content in the units is generally what is expected in an English program and are all valued in their intent but the way the course is organised does not reflect how English is typically taught.
- The unit focuses do not clearly link to the rationale or aims of using language for a range of purposes. In general, there is a lack of organisation and clear direction in the content and no real sense of what the students are aiming for. For example, "language texts and contexts" includes language of narrative followed by language of persuasion. There do not seem to be any logical links to the strands, now called "key elements". Further:
  - the "Language" strand is not as evident in this course. Clear descriptors and elaborations of language features need to be strengthened
  - the "Literacy" strand is inadequate and does not account for the higher order thinking skills that students will be required to use when comprehending and completing work at a senior level
  - the "Literature" strand seems to be covered adequately, although, there are no clear guidelines on the nature of texts to be read, number of texts to be studied or whether, for example, a Shakespearean play is expected. In the same way that Australian and Indigenous literature are mandated, there should be clearer expectations about other texts representative of mainstream and minority cultural groups
  - the interrelatedness of the strands is not obvious.
- The four sequential units clearly represent significant and meaningful cognitive development across two years of study. However, comments regarding the content and organisation of the English course units consistently included:
  - lack of clarity about the purpose of the units, how the units relate to one another and how they interconnect, why these particular four units and how these understandings about language and texts might be applied by students. The term "broad focus area" is used to identify units, and these units need to overlap and interconnect
  - the understandings about language and texts that are separated as discrete content as the focus of each of the units are intrinsically interrelated and will actually need to be addressed in each of the units
  - the sequence of units is not effective, as major concepts must be studied together (rather than sequentially) each time students examine a text. In addition, Year 1 needs to build to Year 2 so all modes in Units 1 and 2 are revisited in Units 3–4 with increasing complexity and sophistication of knowledge and understanding and with Unit 4 as a culminating unit
  - the organisers or subheadings are different for each unit and do not support teachers to chart specific development of skills and processes across the units
  - the prescriptive organisation does not provide flexibility needed to engage students
  - the number of texts (and their complexity) to be studied in the course may impact on student performance.
- The current headings do not focus on the language, texts and contexts and are not of the same order ranging from specifics to general aspects.
- The lead-in statements are inconsistent, and have very different expectations. For example, compare the first two lead-in statements from Unit 1:
  - "Review, refine and develop knowledge and understanding of the language of narrative in a variety of print, spoken, multimodal and digital texts through …"
  - "Analyse how language is used to persuade through …"

- Unit 1 should clearly state that the focus is on language, text and context and that the text types, narrative, persuasion and visual texts are the examples. The text types are not the focus. There is no issue with teaching narrative or persuasion, but the content in the dot points focuses on "narrative" — not on the skills, processes and knowledges to be able to use, analyse, and enjoy a range of texts (not just narrative and persuasion).
- In Unit 4, the way in which "ethical behaviour" is defined is problematic. This capability needs to be included in content across all of the units.
- While many commented that there was too much content and repetition, the following aspects of essential content are missing:
  - higher order thinking, for example, not enough focus on "evaluate" or "synthesise"
  - the general capability of "creativity" and imaginative work
  - the focus on language, text, and context in Unit 4
  - the emphasis on and clarity about digital and visual literacy and how emerging technologies are to be incorporated in the course, in particular digital, multimodal, visual texts and the evolution of language
  - expectations about the generic features of texts students are to produce, the range of social contexts and reading practices
  - inclusion of textual features — vocabulary, sentence control, nominalisation, grammatical accuracy, cohesion, theme, paragraphing, spelling and punctuation
  - oral competence.

Way forward

- Develop a contextual framework to support the linking of texts with a particular context, purpose and audience (for example, the Text–context model or Functional language model). This would subsequently help to identify aspects of language and literature for further analysis.
- Clarify how the units interconnect and relate to each other so there is a basis from which to make decisions about scope and emphasis.
- Revise the organisation of the four units to show clearly how they build on prior knowledge and critical thinking skills. In particular it should be clear how Year 11 develops to Year 12 and culminates in Unit 4.
- Provide practical examples of how the general capabilities might be evident within the course so that teachers can consider them in their planning, teaching strategies and selection of resources.
- Develop a framework for the construction of the dot point content that focuses on the skills, processes and knowledges about using, analysing, and enjoying a range of texts.
- Revise lead-in statements to ensure consistency.

2.4.3 English as an Additional Language (EAL)

- The potential for multiple entry points was considered positive.
- Teachers commented that the content descriptors are very adaptable and would allow the development of two very different types of courses — one that is a functional English course and the other which is an academic, tertiary preparation course. This means there is the potential for courses that suit a range of students Band Scale 2 to 7. Their concern was that given this range, the course would not be accepted for tertiary entrance purposes as the current Queensland course.
- The level of difficulty in content descriptions within focus areas is inconsistent. For example, in Unit 1 — develop sociolinguistic competence includes:
  - understanding how to use register tone and appropriate languages for audiences (which is complex)
  - using protocols for initiating, sustaining and ending conversations (which is very simple).
- The four-unit course is not logical. Unit 1 is foundation, Units 2 and 3 are subsets of Unit 1, and Unit 4 is application.
- There is overlap.
- Concerns were raised about sequence — especially grammar, which must be taught in context — and the developmental nature of language acquisition.
- Units 1 and 2 are too functional and do not have a context for learning that is specific to language acquisition skills.
- Some very specific content in each unit will make the course more challenging to teach to a diverse clientele (for example, the emphasis on text analysis at the expense of proficiency in language). In addition, the use of the same suggested texts for EAL and the English course was queried.

Way forward

- Redraft course content descriptions to include development of:
  - spoken English
  - language for academic learning across the curriculum
  - capacity for further academic study.
- Revise the course to recognise the difference between receptive and productive skills. This needs to take account of the fact that receptive skills are developed to a higher level earlier than productive skills in ESL learners.
- Include greater emphasis on oracy, research and academic skills.
- Select more appropriate texts to suit the needs of the cohort undertaking the EAL course.
- Use a common metalanguage — language conventions, critical literacy, visual language, grammar (traditional functional) across the course.
- Redevelop as two, one-year courses, with year one general and year two focused on deeper knowledge and understanding.

2.4.4 Literature

- Further work is needed to differentiate a strand in a course from a course of the same name. This involves reaching agreement on a definition of “literature” in the two contexts.
- The role of contemporary literary theory and knowledge in both underpinning the subject itself and as content of the subject is unclear. This course of study must present an agreed position on what constitutes study of Literature and best practice in teaching literary theory if the course is to be dynamic and challenging for students.
- The Literature course parallels the other English courses in its four-unit organisation. As with the other courses the sequencing lacks clarity about increasing complexity, independence and use of higher order thinking skills.
- Concerns were raised about the implied assessment, for example, the use of the stem “create” as in “create an original and imaginative literacy text”, “adapt texts” and in Unit 4 “critically analyse how texts become part of the literary heritage and suggest recommended texts for a body of literature…”.
- Too much content, which will result in superficial treatment. Yet it is unclear what students will know and understand by the end of the course.
- “Aesthetic” is not defined so it is unclear what the expected learning would be.
- Reflection is missing.
- There is a confusing unevenness in the development of the dot points across the course. For example, when examining the ways that ideas, events and people are represented, teachers are to include “specific motifs”, which is vague and unhelpful; whereas later there is “the ways representation operates in metaphor” which is very specific. In genre (which is never defined), dot points range from the very general “popular culture” (again, undefined) to the specific consideration of parody which is separate from a consideration of the broader genre, satire. In Unit 4, teachers are directed to “use the appropriate metalanguage to express justification and evaluation” but there is no direction as to what the “appropriate” metalanguage is. This is a snapshot only. The content descriptions offer no clarity about what are the expectations in this course. If an aim of the Australian Curriculum is consistency across Australia, then there needs to be clarity in the content descriptions.
- Some concerns were raised that if students are able to select only the Literature course, it will be a major shift from the current Queensland situation where students are required to study English with the option of selecting English Extension in Year 12. However, others commented that the two-year course with its focus on literature would be more accessible than the current Queensland extension course with its focus on literary theory.
- The Literature course of study has a strong focus on reading a wide range of texts and provides an opportunity for independent study. However, increasing independence in learning should be included in all courses in the senior phase of learning.
- The is a great deal of “empty” language, for example in Unit 1: “interpretive community”, “textual integrity”, “intellectual inquiry”. Terms such as these need to be in a glossary, or deleted in favour of more precise use of language.

Way forward

- Review the definition of literature and align with the definition in the English Shape Paper.
- Consider changing the title of this course. Suggest “Literary Studies”.
- Improve the sequential development of the units so that there is increasing complexity and independence.
- Develop an internal logic in the course to clarify the dot points so that they are logical and include exactly what is required.
- Ensure all terms are defined.
- Provide more specific guidance about how the general capabilities are expected to be demonstrated.
- Reduce the amount of content to be covered.
- Include contemporary literary theory.
- Refer to text types, not specific texts.

2.5 Other considerations

Prescribed text lists

The following concerns were expressed about the prescribed texts lists.

- Textbook prescription is not a part of current educational culture or practice in Queensland where schools have been entrusted to select their own texts within the guidelines of the syllabus.
- As Queensland does not assess student learning in the senior years through an external examination, the need for prescribed texts is unnecessary and unwarranted.
- Prescribed texts diminish a school’s ability to select texts for diverse cohorts with wide language, educational and cultural backgrounds.
- The specific inclusion of Aboriginal and Torres Strait Islander texts is welcomed.
- The overemphasis on Asian texts to the exclusion of other cultures was raised as a concern given the diversity of students’ backgrounds. It is important that other ethnic groups are catered for by providing flexibility in selecting appropriate texts.
- Units currently offering the study of popular fiction (e.g. crime, science fiction) that also require complexity in knowledge, cognitive processes and language skills may be discontinued, as these genres are not on a list.
- A number of the suggested texts are either out of print or cannot be ordered as class sets.
- The categorisation of texts does not inform teachers of the purpose of each category and how texts will be selected to cater for:
  - the range of student capacity, interest and need
  - cultural diversity and representation
  - traditional and contemporary perspectives.
- Concerns were raised about how the list was compiled, and how it will be amended and refined.

Way forward

- Provide a list of suggested or recommended texts rather than prescribing texts. For those states that need to prescribe texts for an external examination, these could be included in the assessment requirements for that state/territory.
- Include prescribed text types rather than specific texts in content descriptions. These could be included in the overarching statement for the course, or in each unit. For example, an Australian novel; a Shakespearean play; contemporary poetry.
- Make suggested text lists available as a resource on the web (and not included in the content description for the course). This would enable an extensive list that could be regularly updated, and would:
  - better reflect contemporary concerns and issues for learners in the senior secondary years
  - match the learning needs of all students
  - be diverse and engaging to students
  - be representative of the range of cultural and language backgrounds of students, and inclusive of Aboriginal and Torres Strait Islander perspectives and Australian issues.
- Refrain from prescribing a particular edition or publisher unless necessary. For example, novels written in the 19th century do not need a specific edition, whereas a particular collection of short stories might require publication details.
- Make explicit criteria and processes for the selection and updating of text lists.
- Clarify the terms “texts from Asia” and “texts from an Asian perspective”.

Cross-curriculum dimensions

- Cross-curriculum dimensions are not well defined, inclusive, capable of being localised or related to the discipline of English. For example, “sustainability” is not reflected in the sample text lists, and is not explored in its representation in texts or in how language conveys understanding of or prescribes action to address the issue. Each of the cross-curriculum dimensions should be defined in the context of the learning area, English.
- Cross-curriculum dimensions should be embedded in all courses through the content descriptions.
- There are token references to Indigenous history and culture in the text selection requirements (Australian literature, including the inscriptional and oral narrative traditions or contemporary literature of Aboriginal and Torres Strait Island peoples), however this is not outlined in the sample list at all.

Glossary

- Content descriptions must be accompanied by a glossary of terms, as there is metalanguage that is peculiar to practices in particular states and territories. Not all states have a shared understanding of key terms.
- There is inconsistency in use of terms across and within the curriculum documents. Consistency of terms is essential, particularly if students move from course to course.
- Words that need clarification in the context of the document include:
  - aesthetic
  - collaboratively
  - enjoyment
  - evaluation
  - genre
  - image (as opposed to visual text)
  - linguistic resources
  - persuasive
  - representation
  - texts and literary texts
  - textual response and production
  - voice and tone

3. History

This section summarises feedback and recommendations for the two history courses.

3.1 Overall comments

Strengths

The three schooling sectors and the QSA agree that the senior secondary Ancient and Modern History courses have the following overall strengths:

- the development of historical skills through a process of inquiry
- alignment between knowledge and topics in both courses and existing Queensland courses
- flexibility in unit structure and course content through the inclusion of choice within and between units
- opportunities to study a range of world and social histories
- the content selected has the potential to be interesting and engaging for students
- several topics are currently taught in many schools in Queensland
- some units are well conceived, e.g. inclusion of “First nations and the struggle for recognition and equality” in Modern History
- some links are made to Continuity and Change and other historical understandings within the current draft K(P)–10 curriculum.

Issues and concerns

Issues and concerns consistently raised about the senior secondary Ancient and Modern History courses include:

- the structure of both courses moves away from describing the curriculum content, giving a level of prescription usually found in state-based syllabus documents that link to an assessment program
- there is a lack of common organisational structure between the two history courses (six units for each is preferred)
- the structure within units and across both courses places too much emphasis on specific historical knowledge. The conceptual development of learning across two years through “big ideas” needs to be more carefully and more explicitly structured in the rationale, aims and course organisation
- some content areas are overemphasised at the expense of other social or environmental histories (e.g. a focus on conflict/war histories and archaeology)
- there is a lack of alignment of terminology related to historical skills across the rationales, aims and course organisation between the two courses
- there are juncture issues between Year 10 and Years 11 and 12, including a perception of repetition (e.g. Unit 1 of Modern History revisits the introduction to history and WWI found in K(P)–10)

- the skills sections of both courses are underdeveloped and do not have an obvious framework or taxonomy that indicates how the skills will develop over the two years of the courses. If they are to remain as generic statements, they need to explicitly state that the complexity and sophistication must increase over each course's duration.

3.2 Rationales and aims of the courses

Rationales

Consistent feedback expressed disappointment with the content of the rationales for both courses, and the need for consistent information in the rationale for both subjects. Other points raised are listed below.

- There is general support for inclusion of "curiosity and imagination" as drivers of the curriculum. There is support also for the commitment to specific historical processes and skills, and the recognition of both the interpretative, value-laden nature of the discipline and of the representation of the past through different perspectives. It is commendable to equip students for the world in which they will live. However, there is a concern that the rest of the document does not meet these aspirations.
- It is unclear why common terminology is not used where it is appropriate in the rationales for Ancient and Modern History. Currently, the wording is similar but not consistent.
- A rationale is not the place to outline the course structure. Rather, a rationale provides opportunities to explore the philosophical and conceptual issues about the study of history:
  - What is history?
  - What specifically is Ancient History / Modern History?
  - How will students' lives be enriched through the study of Ancient History / Modern History?

Way forward

- Include an overarching rationale for the history courses.
- The overarching rationale should answer these questions:
  - What is the learning area, history?
  - What are the educational goals of the learning area, history?
  - Who are the students served by the learning area, history?
- Use common and consistent wording for Ancient and Modern History as appropriate.
- Remove the focus on course structure.
- General and specific sections of the rationales of Ancient and Modern History need to be separated.
- Focus on the philosophical and conceptual issues of Ancient / Modern History.
- Teachers would benefit from a more developed framework to understand the topics in detail. This may take the form of an extended rationale or an outline of key concepts, questions, themes, problems and issues.

Aims

- What is the purpose of the aims? Do they set the framework of the course? The curriculum needs to clarify the difference between aims and objectives. The multiple references to aims on the first page of both courses reveal inconsistent descriptions.

Way forward

- The aims should be more specific to the particular course. They should be based on the organisation of the curriculum content — descriptions of what students will learn in terms of knowledge, understanding and dispositions.
- The aims of the senior secondary courses should be rewritten to provide a structure that sets up the necessary alignment between what is expected to be taught, what is taught, what is assessed and what is reported. In this way the aims will inform the achievement standards.
- Aims should include common expectations across a learning area and specific aims for a course. This is a key equity consideration where differentiated and specialised courses are offered.
- The aims should reflect the key skills, processes and cognitions expected to be demonstrated in student learning.
- Reference to specific content within the aims of a course is redundant and should be removed.
- Any affective aims of a learning area need to be written as long-term goals, attitudes and values, and should match the aims set out in the relevant shape paper.

3.3 Course organisation and structure

- There are limited or no conceptual links made between the units of study.
- The interrelated strands of “Historical knowledge and understanding” and “Historical skills” are welcome, but the document does not provide a coherent and workable organisational framework.
- There needs to be clearer guidelines about how these courses are intended to be structured into coherent programs of study.
- The document suggests that a process of inquiry underpins the approach to the study of history, but it does not provide a clear, coherent or comprehensive description of the enquiry process that teachers will foster and in which students will become proficient.
- There is only one real comparative study (Unit 2b in Semester 2 of Year 11) as an option. The comparative study topic is difficult and requires advanced skills. It is suggested that the study might be better suited for Semester 2 of Year 12.
- The structure around Units 1 and 4 as introductory and concluding units, respectively, does not accommodate composite classes. This will disadvantage students from smaller schools, especially in rural and regional areas, as schools with composite classes will not be able to offer Ancient and Modern History.
- Similarity of topics in Units 1 and 4 makes these units potentially repetitive and of limited interest to students.
- The sequential nature of the units does not facilitate changing the order of units to suit specific local conditions. For example, archaeological field work is not appropriate in Semester 1 in Far North Queensland due to the wet season.

- The intent to emphasise depth rather than breadth in the content is noted. That being said, the range of topic choices needs to be wider to allow choice based on student interest.
- Consistency in the organisation set for the two history courses would be beneficial. In Ancient History, the Historical knowledge and understanding section lists all the details of the content whereas in Modern History, the details are listed under “case studies”.
- General capabilities reflect those in K(P)–10 curriculum. There may be a place for “self-management” as this is an identifiable aspect of undertaking research inquiry.
- The Numeracy statement appears tokenistic.
- The traditional range of topics might limit the scope of intercultural understanding, although it does include some topics relating to Asian, Indigenous Australian and Central American groups.
- Sustainability could be included more explicitly.

Way forward

- Consider an organisational structure that does not demand sequential delivery, and enables amendments for composite classes and local conditions (a six-unit model has been suggested in some forums).
- Consider the possibility for greater breadth and choice of topics while maintaining the depth of historical inquiry.
- Reconsider the order of the units to ensure conceptual complexity increases appropriately through the courses over the two years.
- Ensure that historical skills are written to be developmental and show progression from Year 11 to Year 12.
- Consider using a more consistent organisational structure where appropriate across the two courses.
- A glossary will be necessary to define key terms, e.g. what is meant by “ethical behaviour” when conducting research?

3.4 Content of the courses

There is potential for schools to design very narrow courses of study, e.g. coverage of the histories of a limited range of nations, regions or locations. The definition of topics by time periods for both courses is in some instances too narrowing and in others creates a list of topics that limit the depth of studies.

- Modern History needs to encompass contemporary events and be representative of the span of modern history.
- Ancient History needs to refer to 500 CE being problematic with the study of Asian and American societies.

3.4.1 Ancient History

- The rationale does not provide a sense of the broadness of the possible scope of Ancient History. The curriculum content presented in the rationale is narrow.
- The Ancient History course organisation builds on the K(P)–10 organisation. The curriculum content of each of the units has some well-established content.
- The approach to Classics, Archaeology and Ancient History differs. In some states and territories, the distinctions have merged at senior secondary level while in others there is a much clearer separation.
- Archaeology is privileged and presented in an illogical sequence in Unit 1 and then again in Unit 4. Queensland does not support a course in Ancient History that is dominated by the study of archaeology as it is in other jurisdictions.
- The choices within the course do not indicate that a school must teach the breadth of Ancient History topics. The course makes it possible for students to study the same region (e.g. Egypt, Near East, Greece or Rome) for three units.
- The course does not adequately address the required depth to which studies are to be completed. This would be addressed by specifying that no more than two units of either Egypt, the Near East, Greece or Rome can be studied across the four units. An additional specification might be that in Units 3 and 4 students must study no more than one of either Egypt, the Near East, Greece or Rome.
- There is a lack of clarity regarding the context, purpose and expectations of each unit. Topics are presented out of chronology and context. The three Greek and three Roman options (Unit 3) are inextricably linked by cause and effect and need to be taught concurrently or chronologically.
- Unit 2b is relevant to students.
- Unit 2b's thematic approach will work well for Queensland.
- Units 3 and 4 could be very prescriptive and narrow.
- The absence of scope for the study of the early medieval period is raised as a concern in Queensland, where that topic can currently comprise up to one quarter of the course.
- There is a lack of scope to study the history of the Americas, e.g. Mayan, Incan, and Aztec civilizations.
- A continuum of skills is present, but it is not sequenced effectively.
- As with Modern History, it is puzzling why apparently generic skills have been added to the end of each unit.

Way forward

- The Ancient History rationale requires a greater sense of the broadness of the study.
- The rationale should include "ancient" in all references to history. By defining the end of the Ancient period as 500 CE, it makes the course very Eurocentric and excludes some Asian and Central and South American studies.
- Ancient History should have six units to match the structure of Modern History.
- The aims should include evaluation.
- Clarify the context, purpose, expectations of each unit.
- Clarify how it is intended that an overall course should be structured.
- Include the flexibility to study non-European civilisations, e.g. Mayans, Incans and Aztecs.

3.4.2 Modern History

- The definition of Modern History is too narrow and should connect with the Reformation, Enlightenment and Scientific Revolution.
- The rationale does not provide a justification for the study of Modern History. Nor does it provide a framework for the knowledge and understanding and skills of the course.
- A lack of continuity in the Modern History course will mean a fragmented study of topics and will diminish the logic that a senior history course should offer students.
- The time span — 1880 to 1945 — is problematic and limits the focus to contemporary topics, e.g. completing a national study of the United States in 1945 will give an incomplete understanding of the modern American nation.
- The "nation state" and "national identity" are worthy areas of study in a Modern History program. However, the cut-off date (generally 1945) is problematic and ignores a whole period of modern history up to the end of the 20th century. It also limits the conceptual approach to such a study by ignoring changes and developments since 1945.
- The sequencing of units as they exist is inadequate. The content and cognitive demand of Unit 3 is not as great as Units 1 and 2, while Units 2a and 2b do not have the same cognitive demand or the same structure as Units 3a and 3b.
- The units lack clear conceptual purpose statements that detail the big historical question to be studied by students. The curriculum provides "content" statements rather than "context and coherence" statements.
- Although there is a connection between K(P)–10 and the senior course, with topics such as WWI and the Cold War prominent in the draft document, there is concern about student perception of repetition. The difficulty here is that in Years 9–10 students will study Australia in the modern world from a global perspective. With this focus on the same area as senior Modern History and the expectation that there will be Depth Studies in the K(P)–10 course, avoiding significant overlap, whether actual or apparent, will not be easy. At the moment, with the K(P)–10 and senior courses being developed separately, it is not clear how this issue is being addressed.
- Choices which are required in selection of topics limit access to vital areas of study. Students need to choose one topic from Units 2a and 2b and 3a and 3b. Studying at least two subtopics would more fully form students' understanding of the subject and would provide more effective opportunities for both teacher- and student-focused inquiries. This could also enable a comparative study within the theme of the unit.
- It would be possible for a school to choose a very narrow focus of study within the current course descriptions. An example could be:
  - Unit 1: WWI case study
  - Unit 2: Germany 1870–1945
  - Unit 3: French Revolution
  - Unit 4: WWII Asia Pacific Region / Indonesia 1937–present.
- The issue of "national identity", while stated in the title of the unit, only seems to apply to Australia and leads to inconsistency.
- The additional study of "an individual" is problematic. It would seem appropriate to study a significant individual while studying the nation state, not afterwards.

- Unit 3a is a popular area of study and is appropriately included in this curriculum document. However, a number of issues were raised:
  - as with the topics Recognition and Equality, Unit 3a has choice limitations. Selecting one area of study precludes an important range of other study areas. In responding to the imperative of the rationale that students should understand the world they are growing up in, there must be serious consideration given to a study of the Arab–Israeli dispute and the related issues in the Middle East
  - there is an emphasis on events up to the 1960s and early 1970s. Events since that time should also be examined
  - the topic on decolonisation is poorly set out and does not provide a clear, coherent context, and the Asian and African countries listed do not always match with the provided colonial powers list.
- Unit 3b is problematic. The revolutions that are included are traditional areas of study. There should be scope for modern revolutions, especially more recent, non-violent revolutions such as the Revolutions of 1989. Again, the requirement to study one revolution limits choice. It is worth examining whether students should spend an entire semester studying the American Revolution but not study the Solidarity Revolution in Poland, the People's Power Revolution in the Philippines or the transformation of Argentina through the Mothers of the Disappeared.
- Unit 4 provides an opportunity to study Australia's social and political history, but preference is given to the study of the Pacific War. The latter has relevance in the development of Australia's relationship with the USA, but this does not appear to be the course's primary focus. The impact of the war on the home front in Australia and its contribution to the growth of the Australian identity is also excluded.
- The choice for an Asian country for study omits India and Korea. Further, this area of study is primarily through Western eyes and does not reflect the cross-curriculum dimensions statement in the document. It is possible that this could be the only occasion when students might study Asia in the entire four semesters, yet they may spend an entire semester studying the American Revolution of the 18th century.
- Some support is expressed for a study of two Asian nations (with India being included as a possibility) from the 1930s as the focus of the unit. This would include the Asian nations' experiences in the Pacific War as well as post-war reconstruction and/or independence movements.
- The dot-point content material could lead to a content-based approach to the study rather than an inquiry approach.
- The skills between Years 11 and 12 need to be differentiated if they are to be seen as developmental.
- There is inadequate evidence of the general capabilities developed in the curriculum content.

Way forward

- The rationale defines the course of study as "from the late 18th century through to the end of the 20th century". Alter this to "from the late 18th century to the present day" to reflect the longevity of the syllabus into the 21st century. Alternatively, the scope of the course could be defined by the study of events from the recent past that have influenced the nature of the modern world and contemporary society.
- Revise so that there is a common course and unit structure for both history courses (six units for both Ancient and Modern History).
- Develop an overview and purpose statement for each unit that links the conceptual focus, or "big ideas", to emphasise the developmental relationship between the units.

- Adopt a framework for Introductory, Bridging or Comparative studies. Each semester unit should describe the introductory/background topics to be covered, a choice of studies to be undertaken in depth (these may include comparative studies) and concluding studies that allow the study to be given a contemporary context.
- Revise so that each semester unit is structured to allow students to study two topics in depth.
- Introduce flexibility to allow completion of more than one area of study in a semester.
- Revise Unit 3b to give students the opportunity to study two revolutions. As it is currently presented, the course limits choice and narrows available opportunity for comparisons.
- Consider the following modified organisation of the course:
  - Unit 1: Nations, Nationalism and National Identity
  - Unit 2: International Conflicts and Cooperation
    - a. International conflicts
    - b. International cooperation
  - Unit 3: The Individual, the State and Forces of Change
    - a. Revolutionary change
    - b. Movements for social change
  - Unit 4: Conflict and Cooperation in Australia and Asia.
- Ensure that the K(P)–10 revision aligns with the Year 11 course.
- Include a glossary.

4. Mathematics

This section summarises feedback and recommendations for the four mathematics courses.

4.1 Overall comments

Strengths

The Queensland Studies Authority and the three schooling sectors agree that the four senior secondary mathematics courses have the following overall strengths:

- a combination of four courses that cater for a diversity of student needs and ability levels
- the topics and content of the courses are comprehensive
- the courses have the potential to be rigorous
- they provide a sound basis for further study
- the topics that are to be taught are clear
- the inclusion of investigation in Essential Mathematics.

Issues and concerns

Issues and concerns consistently raised about all four courses in senior secondary mathematics are summarised below.

- The curriculum lacks a coherent framework and deviates from the approach taken in K(P)–10.
- The unitised nature of the curriculum is inflexible.
- The rationales, aims and content descriptions do not reflect the intent described in *The Shape of the Australian Curriculum: Mathematics* (May 2009).
- The rationales lack a vision and a sense of excitement. They simply list the course structure, some of the content and possible careers, and do not present the case for studying mathematics or the specific courses.
- The curriculum is too focused on content and does not adequately address the proficiencies.
- The curriculum has too much content for the indicative hours.
- There is a lack of problem solving across all the courses.
- There is a big gap between Essential Mathematics and General Mathematics, and something of a missed opportunity to celebrate differences in courses. Though the four courses cater for a diversity of students, they do not meet the needs of all.

4.2 Rationales and aims of the courses

Rationales

The following issues relate to the rationales in the mathematics courses.

- The rationales do not clearly identify the intended audience, or who the courses are for. This could be rectified by being clearer about the intended pathways for students for each course.
- Some of the suggested pathways described in the rationales are limiting. For example, Specialist Mathematics refers only to university mathematics, physical sciences and engineering. It could also include computer science and economics.
- The rationales are too content-focused. A 21st century course should emphasise the cognitions, higher order thinking and the conceptual understandings that mathematics aims to develop. A rationale should not just be a precis of the content within the course — the content is identified in the course overview.
- Rationales should emphasise the importance of mathematics to all aspects of life and the modern world.
- Rationales attempt to define the discipline of mathematics upfront. This aspect of the rationales should be built upon.

Way forward

- Ensure all course rationales address the questions: “Who is the intended audience?”, “What are the students’ capabilities?” and “What will students get out of it?”
- Include an overarching rationale for mathematics.
- The overarching rationale should answer these questions:
  - What is the learning area, mathematics?
  - What are the educational goals of the learning area, mathematics?
  - Who are the students served by the learning area, mathematics?
- Include statements about the connectedness to the other key learning areas.
- Clarify intended pathways for students for each course. Pathway statements should be explicit about how the course of study prepares young people for university courses, vocational education or work.
- Emphasise the importance of mathematics to all aspects of life in the modern world.
- Move content descriptions to course overviews.

Aims

According to the Mathematics Shape Paper, the aims of the mathematics curriculum are to:

- educate students to be active, thinking citizens, so they can interpret the world mathematically and use mathematics to make decisions
- critically examine issues by using and interpreting mathematical perspectives
- appreciate that mathematics is inherently valuable, beautiful, elegant, powerful and enjoyable.

The aims of the four senior secondary Australian Curriculum mathematics courses do not take this form. Aims across the courses can be broadly categorised as:

- knowledge and application
- using technology
- evaluation.

This raises the question as to the purposes of the aims. Are they intended to be the assessable objectives of a course from which standards will be developed, or affective, non-assessed "global aims"? In either case, there is scope for improvement.

As it stands, the aims are too focused on the content of the courses.

Way forward

- Clarify purpose of aims.
- Redraft aims to focus specifically on the proficiencies developed over the course: that students should be able to evaluate, reason, analyse, synthesise and solve problems.
- If the aims are intended to be affective objectives, they should more clearly reflect the aims outlined in the *Shape of the Australian Curriculum: Mathematics*.

4.3 Structure and organisation of the courses

The following issues relate to the structure and organisation of the senior mathematics courses.

- The stated aims of the courses are not realised through content descriptions.
- The courses are too content-heavy. To deliver the aims of the courses and the mathematical proficiencies, topics must be allocated sufficient time to be properly developed.
- The units are made up of content descriptions that are lists of topics. They lack an overarching "big idea", theme or purpose.
- The units are too prescriptive in their intended sequence. This is at odds with the flexibility given in the K(P)–10 mathematics curriculum, which allows teachers to develop a "big picture" view of mathematics and to focus on the interrelationships between topics.
- The proficiencies are not easily identified in the content descriptions.
- The content descriptions are inconsistent in their description and depth. They often do not adhere to parallel form. They are described in different ways and they are not equal in granularity, ranging from big ideas to trivialities. For example, in Essential Mathematics, the broad statement, "metric units of mass (and weight), their abbreviations, conversions between them, and appropriate choices of units" is a content description. In a later unit, however, the content description is a specific unit conversion: "nautical miles and their conversion to and from kilometres (1 NM = 1.852 km)".
- ICTs usage and descriptors need to be reflective of a 21st century curriculum.
- General capabilities are inconsistently identified. For example, in Essential Mathematics Unit 2, "interpreting complex timetables such as tide charts, sunrise charts and moon phase" is a Thinking skills General capability, whereas "interpreting timetables such as bus, train and ferry timetables" is not. Perhaps "interpreting" on its own is not classified as a thinking skill, but "interpreting complex ..." is.

Way forward

- Strengthen and more easily identify the "Proficiency" strand by:
  - developing generic proficiency descriptions (as is done in history and science with "Historical skills" and "Science inquiry skills"). That is, statements of the key mathematical skills and processes to be developed over the courses
  - further developing the proficiencies that are embedded in the content descriptions, with greater emphasis placed on investigative modelling, problem solving and application processes.
- Provide a "Proficiencies" filter that can be applied to the content descriptions of each course, as can be done with the General capabilities.
- Reduce the content of the courses. Provide a "big idea" for each unit and topic, and ensure the prescribed content follows from this.
- Rewrite content descriptions to:
  - be more than content-focused
  - develop key concepts rather than discrete fine-grained topics
  - be more consistent in their depth
  - give investigations greater significance
  - give more prominence to mathematical modelling.
- Rework investigations to ensure connections within and between mathematics strands.
- State the prior knowledge required by students at the beginning of each unit.

4.4 Content of the courses

4.4.1 Essential Mathematics

- The reference to "investigating", and the inclusion of investigations, are positive attributes of the course.
- The course attempts to position itself as meeting the needs of a group of students whose needs have not been met in some states with current syllabuses.
- The course attempts to design topics and content that relate to each other and have applications to real world situations.
- The course is far too content-driven given it is primarily aimed at students who have not had success in mathematics in K(P)–10. It is essentially a revisiting of content already covered in the lower secondary years. The value of revisiting content already covered is questionable.
- The course is too regimented and rigid. It does not represent 21st century learning and will not be relevant to students — it will be disengaging.
- "Investigation" as a stand-alone topic does not work. As a stand-alone topic, investigation will not ensure connections within and between mathematics strands are made.

- Students choosing this level of mathematics would typically require structured learning which would be accomplished with short and well-controlled investigations throughout the two-year course rather than the three extensive ones proposed. Where possible, these investigations need to be across topics so that students develop an interconnectedness of mathematics in the world in which they operate now or will operate in the future. Short and well-scaffolded investigations may better enable students to achieve their best.
- "Algebra" should not be a stand-alone topic.
- Course rationale mentions ICT but this is not followed through within the content. The descriptors are used inconsistently, and greater clarity is needed to direct the depth of study required.
- The use of technology aim implies the focus is on the device and its applications rather than using technology as the means to encourage the construction of meaning and working with others. It also is seen as relevant to workforce applications.
- Mathematical modelling is not promoted enough.
- There is no mention of Pythagoras and basic trigonometry (right-angle triangle trigonometry) in content descriptions.
- It is unclear as to whether this course is intended to be pre-tertiary. If it is, then it appears to be pitched at too high a level for students.

Way forward

- Essential Mathematics should aim to build student confidence and success in mathematics in real-life contexts.
- It requires further focus on the practical applications of mathematics and needs to be driven by an inquiry model.
- This course needs to be contextualised and based on exploration and investigation.
- Investigations should be one of the key learning experiences by which students learn the content, embedded throughout the course, not a stand-alone topic.
- Algebraic skills and facility need to be explicitly taught in context and embedded throughout the course within the topic being studied.
- The use of technology aim should be rewritten in its own right and not refer to the first aim.
- Key concepts and contexts should be highlighted. For example, instead of teaching the "Price index numbers" as a discrete topic, it should be within financial modelling.
- Mathematical modelling should be promoted where possible.
- A study of Pythagoras and basic trigonometry (right-angle triangle trigonometry) should be included. As a minimum, include the 3–4–5 triad, which is fundamental to success in measurement and design. There is no mention of it in content descriptions.
- The depth to which topics should be taught needs to be clarified.
- Numeracy needs to be made obvious and should be embedded in all topics.
- Some basic scale work such as 1:2, or 1:5 should be included in the "Measurement" topic in preparation for the "Design" topic.

4.4.2 General Mathematics

- The reference to "investigating" is a positive attribute of the course.
- While the course refers to "investigating" in some of the content descriptions, there is a general lack of reference to investigations. Are students required to undertake mathematical investigations?

- There is some good modelling in the topic “Growth and decay in sequences”.
- The topics have clear endpoints.
- Flexibility to move between General Mathematics and Essential Mathematics or Mathematical Methods as appropriate is seen as beneficial and necessary for developing students at this stage of their education. However, many students may find Essential Mathematics to be too fundamental but General Mathematics to be too challenging.
- The General Mathematics course will be challenging for the majority of students studying this level of mathematics. The course appears to be targeting a small group of students who intend to enter business or finance courses at tertiary level. By developing this course, the needs and interests of a significant number of students wishing to study mathematics in the senior years have been overlooked.
- The enhanced algebra components of the course will make it overly difficult for the students that will likely study it. Topics like “Matrices”, “Linear modelling” and “Linear programming”, “Growth and decay in sequences” plus some aspects of “Data analysis” and “Financial modelling” will offer a significant academic challenge to the cohort of students selecting this course.
- This course assumes numeracy and algebraic skills. “Algebra” is a topic in Essential Mathematics but it is not mentioned in this course. While not arguing for it to be a distinct topic, it should be embedded and explicitly stated in General Mathematics.
- Too much content to be covered which will mean a lack of time given to deeper understanding of topics.
- The course is seen as a mishmash of mathematical topics. There are too many stand-alone topics, such as the topic on “Price index numbers”. Does “Matrices” need to be a stand-alone topic or could it be embedded?
- Introduction of materials and sequences generated by first grade linear materials is too difficult for this group of students.
- The reference to logarithms and their applications are not set in context in the “Rates and ratio” topic (introductory topic that reviews and builds on K(P)–10) and should be removed.
- “Matrices”, if needed at all in a course titled “General Mathematics”, should follow the “Measurement and geometry” topic.
- “Price index numbers” and “Linear programming” need to be in context and structured appropriately for this course. As with matrices, their relevance at this level is questionable. “Price index numbers” as stand-alone topic should be removed and the applications and relevancy of linear programming need to be reconsidered.
- The absence of land measurement is a problem.

Way forward

- An improvement in the connections between the topics is essential.
- Remove or make optional the topics “Graphs and networks” and “Time series analysis” to reduce the amount of mandatory content and increase relevance.
- Investigations should be given further emphasis throughout the course. They are a great opportunity for students to be in charge of their own learning and to explore topics in context.
- It is important that investigations have structure and are scaffolded for the intended student population.
- Land measurement should be included in this course.

4.4.3 Mathematical Methods

- The sub-topics “Numerical surds” and “Graphs of relations (circles)” are strengths of the courses.
- There is too much content in the course to do justice to the depth that the students who will select this course will require.
- There is no mention of “investigating”.
- Students in Year 10 will need increased groundwork/content to cope with the demands of this course.
- There is too narrow a focus on algebra functions and calculus.
- Pythagorean identity in Unit 2 topic 1 is not explicitly mentioned.
- There is an overemphasis on statistics.
- Use of row reduction in Unit 3 topic 2 is questionable given all students have access to technology.
- It is difficult to see the intended depth of the topics.

Way forward

- The binomial theorem and the associated remainder theorem and factor theorem could all be better placed as Specialist Mathematics topics.
- The matrix solutions for the solution of simultaneous equations in Unit 3 seem out of place without further study of matrices elsewhere in the course.
- Much of the statistical inference in Unit 4 seems irrelevant at this level, and creates too much emphasis on statistics at the expense of exploring some of the other essential topics in depth. This could be removed.
- Investigations need to be a feature of this course.

4.4.4 Specialist Mathematics

- Unit 3 topic 3, “Implicit differentiation”, and Unit 1, “Mathematical proof”, are strong aspects of the course.
- It has a good focus for university studies.
- The options are consistent with what is currently taught in Queensland’s Mathematics C course.
- It develops students as good mathematicians, in terms of protocols, processes, presentations and language.

- In Unit 4 topic 2, teachers do not want to have to choose between the options “Vectors and dynamics”, and “Further calculus techniques and inequalities”, as both techniques are useful for university preparation.
- Unit 2 topic 1, “Parametric equations”, is far too early in the course, as no previous Cartesian equations (conics) have been included.
- Mid-year intake causes problems with doing Unit 1 topic 2, “Real and complex numbers” and then doing Unit 3 topic 4, “Complex numbers”.

Way forward

- Content descriptions should:
  - address the significant topics of “Vectors” in Unit 1 and Unit 2 and “Matrices” in more depth
  - incorporate proofs in relevant topics throughout the course
  - not include the topic of “Graph theory”, as it does not link with other content — “Graph theory” would be better offered as an optional topic or moved to Unit 4, allowing more “Dynamics” or “Vectors” to be included as essential.
- “Differential calculus” should be moved to Unit 2 in place of “Graph theory”.
- “Integral calculus” should be moved from Unit 4 into Unit 3 to occupy the slot where “Differential calculus” existed.
- There is an opportunity to include permutations, combinations and counting methods as an additional optional topic. These concepts can be challenging.

5. Science

This section summarises feedback and recommendations for the four science courses.

5.1 Overall comments

Strengths

The three schooling sectors and the Queensland Studies Authority agree that the senior secondary science curriculum has the following overall strengths:

- the continuation of the three strands from the K(P)–10 curriculum, "Science inquiry skills", "Science as a human endeavour" and "Science understanding"
- the inclusion of:
  - "Inquiry" as an underlying approach
  - contemporary examples of science
  - Australian examples of science
  - Science as a human endeavour (which may enable contexts and authentic learning)
- the foregrounding of earth and environmental science in K(P)–10 science will more effectively prepare students for studying the senior course Earth and Environmental Science.

Issues and concerns

The following issues and concerns were raised consistently for all the senior science courses throughout the consultation in Queensland.

- The science courses need an informing framework showing how the strands of "Science understanding", "Science as human endeavour" and "Science inquiry skills" underpin and interrelate in the teaching of science to promote higher order thinking skills.
- The content of the rationales is disappointing, as they do not meet the expectations outlined in the *Shape of the Australian Curriculum: Science* (May 2009).
- The rationales lack a vision and a sense of excitement. They simply list the course structure, some of the content and possible careers, and do not present the case for studying the learning area as well as the specific course of study.
- The draft aims of the four senior secondary science courses align with the expectations set out in the Science Shape Paper. However, they are too generic and should include aims specific to the course of study. The aims for each course are exactly the same except for the reference to the course in the opening sentence.
- The unitised nature of the senior secondary science courses lose the flexibility inherent in the K(P)–10 curriculum, where the content descriptions are described for each year. The flexibility this enables is lost in the senior courses, where units are designed to be covered in a semester.
- The unitised structure of the courses makes it difficult to identify a spiralling curriculum.
- The courses are structured with overly detailed checklists of content.

- Courses are four discrete and separate units rather than a coherent whole, with each unit building on the skills and knowledge students have developed in previous units.
- Course organisation needs to show how:
  - key concepts are addressed across the strands and the two-year course
  - the strands connect, that is “all strands are of equal importance”
  - each unit is more developmentally challenging.
- The mandated sequencing of units will affect teacher capacity to organise programs and contextualise units for student clientele.
- Generally, there is too much content in each unit. The content descriptions should provide clarity for teachers in any school about what young people are expected to know and be able to do.
- The heavy emphasis on content will not allow students to develop a depth of understanding of key concepts through an inquiry approach to the teaching and learning of science.
- The language related to higher conceptual constructs of the science courses is low-level and inadequate.
- Content descriptions lack a parallel form. There is significant variation in their specificity. Some are fine-grained, whereas others are very broad and general.
- Assessment is implied through the mandating of an extended experimental investigation in each unit.
- The content descriptions must be accompanied by a glossary of terms as there is metalanguage that is peculiar to practices in particular states. Not all states have a shared understanding of key terms.
- The term “extended experimental investigation” (EEI) has different meanings for different states and territories. Queensland teachers understand an EEI to be an assessment technique with specific conditions and requirements that is completed once a year in Biology, Chemistry and Physics.
- There should be explicit guidance in the content descriptions to support the teaching of each cross-curriculum dimension. These should connect with the discipline or the reference should be omitted, for example, Asia and Australia’s engagement with Asia is not explicit in the science courses.
- The document becomes purposeless without a clear statement of objectives of learning and clear descriptors of standards for achievement levels. While the states have responsibility for assessment and reporting, there needs to be an agreed understanding about what constitutes standards and expectations for A–E standards.

5.2 Rationales and aims of the courses

Rationales

Feedback consistently expressed disappointment with the content of the rationales for all the senior science courses as they did not meet the expectations outlined in the Science Shape Paper.

- The rationales lack a vision and a sense of excitement. They simply list the course structure, some of the content and possible careers and do not present the case for studying the learning area as well as the specific course of study.
- The rationales do not clearly identify the respective disciplines of the sciences. That is, "what is Biology / Chemistry / Earth and Environmental Science / Physics?" There is some attempt at defining the discipline in the third paragraph of the Rationale for Earth and Environmental Science.
- The rationales do not consider the usefulness of thinking and working scientifically as valuable in their own right.
- The rationale should be clear about for whom the course is designed.
- The rationales should be realised in the intent of the content descriptions.
- The rationales currently begin by discussing how the courses are organised into the three strands. This should be placed in the content structure section.

Way forward

- Include an overarching rationale for the science learning area, K(P)–12 that provides a rationale for studying the learning area as well as the relationship with K(P)–10 and the development from Year 10.
- The discipline of the course should be discussed up front. Begin the rationales with a statement to capture the reader's interest and position the course.
- The overarching rationale should answer these questions:
  - What is the learning area, science?
    Provide a clear description of the nature of the subject area, with its focus on learning about science as a cumulative process, and the process of building science knowledge is as important as the knowledge itself.
  - What are the educational goals of the learning area, science?
    Include why science is important in the 21st century and how science is central to students' learning through its emphasis on being a dynamic, forward-looking, collaborative human endeavour that will support students to function effectively in a scientifically and technologically advanced society. Capture the intrinsic value of science; it is human nature to want to explore the world around us and science has proven to be the most effective method for discovering how it works. Define the place of the general capabilities and cross-curriculum dimensions and how they fit and work in the subject.
  - Who are the students served by the learning area, science?
    Include prerequisite knowledge and understanding, and explain why there is a variety of courses in the science learning area. This is consistent with the Science Shape Paper, which states that in developing the curriculum (both content and achievement standards) consideration will be given to characteristics of learners.
- Complement the overarching rationale with the course-specific rationales that present the case for the specific course and clearly articulate how the courses differ from each other. For each course the rationale should follow a similar pattern:
  - the nature of the course
  - the educational goals of the course, including any prerequisite knowledge and understanding and the status of the course with reference to tertiary pathways and whether it meets the requirements for university entrance
  - the students expected to take the course.

Aims

The *Curriculum Design* paper and the Science Shape Paper have set the expectations for aims that describe "the major learning that students will be able to demonstrate as a result of learning in the course".

The Science Shape Paper clearly states that there are three interrelated strands in the learning area: "Science understanding", "Science inquiry skills" and "Science as a human endeavour". In summary, the expectations for the science curriculum in Years 11–12 are:

- Science understanding: Students will select and integrate appropriate science knowledge in ways that explain and predict phenomena, and apply that knowledge to new situations and events. Science knowledge represents the building blocks of science understanding but it is the dynamic nature of science understanding that will be beneficial to students as citizens in an ever-changing world.
- Science inquiry skills: Students will pose questions, plan, conduct and critique investigations, collect, analyse and interpret evidence and communicate findings. This strand is concerned with evaluating claims, investigating and making valid conclusions. It also recognises that scientific explanations change as new or different evidence becomes available.
- Science as a human endeavour: Students will appreciate the need for informed, evidence-based decision making about current and future applications of science. They will acknowledges that, in making decisions about science and its practices, moral, ethical and social implications must be taken into account. They will also acknowledge that science has advanced through, and is open to, the contributions of many different people from different cultures at different times in history and that science offers rewarding career paths.

The draft aims of the four senior secondary science courses align with the expectations set out in the Science Shape Paper. However, consistent feedback supported the aims but highlighted the following concerns:

- they are too generic and should include aims specific to the course of study — the draft aims for each course are exactly the same except for the reference to the course in the opening sentence
- the overcrowded content will not give the time to achieve the aims
- the aims are not realised in the intent of the content descriptions
- some terms used in the aims, such as scepticism and scientific values, are ambiguous.

Way forward

- The generic aims are well supported; however incorporate one or two aims specific to each of Biology, Chemistry, Earth and Environmental Science and Physics.
- Rewrite content descriptions through the "lens" of the aims — check that the aims are realised in the course content.
- Provide further elaboration on some of the terms in the aims. For example:
  - "scepticism" involves evaluating a claim using scientific reasoning
  - "scientific values" include an openness to new ideas and a respect for evidence.
- Include a curriculum glossary.

5.3 Structure and organisation of the courses

The draft senior science curriculum does not fulfil the following statement from the Science Shape Paper:

> to achieve the stated aims of the Australian science curriculum … there needs to be less emphasis on a transmission model of pedagogy and more emphasis on a model of student engagement and inquiry … a balanced and engaging approach to teaching science will typically involve context, exploration, explanation and application. Wherever appropriate, students should be actively involved in the science concepts being taught. This requires a context or point of relevance by which students can make sense of the ideas to be learnt. The context may vary depending on the students, school or location.

The Science Shape Paper also indicated that each of the senior science courses would:

> recognise the sequential nature of knowledge in the field and enable the development of depth of understanding of key concepts, processes and contexts without overcrowding the curriculum.

Feedback consistently expressed disappointment about the structure and organisation of the four senior science courses. It was generally felt that the draft courses are:

- content-heavy and will not allow for depth of understanding of key concepts through an inquiry approach to the teaching and learning of science
- structured in such a way that teaching key concepts through a context would prove very difficult, if not impossible.

Specific feedback is listed below.

- The content descriptions in science K(P)–10 are described for each year. The flexibility this enables is lost in the senior courses, which describes units that would, presumably, be covered in a semester.
- It is not clear if each of the units represent one semester of the four semesters of a senior course. Is the order of units mandatory? Are the content descriptions within each unit fixed? Can the content descriptions from different units be combined to form new units that suit individual school situations?
- The unitised and inflexible prescription will make teaching entire units in a single context, as currently practiced in Queensland, very difficult. This curriculum would not allow teachers to change their course to suit the “news of the day”. For example, the recent Gulf of Mexico oil spill would be an ideal context for Earth and Environmental Science and Chemistry.
- The unitised structure of the courses makes it difficult to identify a spiralling curriculum in the drafts.
- The three strands appear to be unrelated lists of content.
- The units lack a “big picture”. What is the unit about? What is its purpose? What are the key concepts to be developed within each unit and across the course?
- All science courses advise that for all units “students will use an inquiry approach to investigate and develop their understanding”. This approach is not clearly defined or described in the documents. Is this simply referring to the strand, “Science inquiry skills”? What is the overarching framework?
- Queensland teachers of science are accustomed to working with a framework that guides them to construct context-based units of work. The inflexible structure of units will make this impossible and the risk is that practice will revert back to teacher-centred pedagogies.

- The draft courses are content-heavy, and will not allow students to develop a depth of understanding of key concepts through an inquiry approach to the teaching and learning of science.
- The continuation of the three strands from science K(P)–10 into the senior secondary curriculum is viewed favourably. However, the course overviews merely summarise the units and do not show the interrelatedness of the strands nor any development of them over the two years.
- The issue of composite classes, that is teaching Years 11 and 12 simultaneously, was raised as a concern, given the unitised organisation of the courses. Sequential units of work will have significant implications for the operation of composite classes which are common in small, often remote, Queensland schools.
- Some pathway statements imply hierarchy and greater status. Pathway statements should be more explicit about how the course of study prepares young people for work by making connections between the discipline and pathway, for example, the Extended Experimental Investigations as a form of work-based learning.
- Cross-curriculum dimensions need to effectively connect with the discipline (and content descriptions) or the reference omitted, for example, Asia and Australia's engagement with Asia is not explicit in the science courses.
- Limited advice on how General capabilities are to be taught within each course of study is provided. For effective teaching of the General capabilities, a scope and sequence or other advice is needed.

Way forward

- Define an overarching curriculum framework and scope and sequence to assist in structuring linkages between the three strands, and how these promote the development of higher order thinking skills.
- Outline or refer to an inquiry model.[§]
- There are principles of scientific inquiry that are common to all the sciences. For example, "Using scientific concepts and principles to generate questions and guide the construction of hypotheses that inform the design of investigations". Frame these generic science inquiry skills upfront to underpin all the science courses, and do not repeat them for every unit. This will give students and teachers a common language and way of thinking across the senior secondary sciences.
- The science curriculum needs to be flexible. This could be achieved by stipulating that unit content descriptors can be taught in any order, as in the K(P)–10 curriculum, provided it is taught in the year.
- If the units are to remain as inflexible checklists, it is essential they are given a "big picture" that identifies what each unit is about, what the purpose is and the key concepts to be developed within each unit and across the course.
- Present the course organisation as a combination of text and diagrams (as stated in the *Curriculum Design* paper) that:
  - shows the interrelationships and purpose of the three science strands — this should clearly articulate their equal importance
  - highlights the increase in strand complexity over the four units or two years
  - explains that "Science as a human endeavour" is a source of stimulus for developing context-based units of work that will develop students' content knowledge as prescribed in "Science understanding" and "Science inquiry skills", and underpins all teaching and learning experiences

[§] See, for example, the 5E model as outlined in Hackling (2005).

- provides opportunities for choice by not mandating all the content descriptions for "Science as a human endeavour"
- provides a statement explaining that the overarching science inquiry skills represent aspects of science that help students develop their scientific literacy. Student progress in these skills should occur concurrently, and the complexity and sophistication of the science inquiry skills must increase over the duration of the course. Where course- and unit-specific science inquiry skills are appropriate, these should be developed. However, they should not be artificially constructed to show a difference of depth or intent when there is none.

5.4 Content of the courses

The following issues and concerns about the content of the science courses were raised consistently throughout the consultation in Queensland.

- The draft curriculum is content-heavy. Overall, there is far too much content to be taught in too short a period of time, and this will not allow students to develop a depth of understanding of key concepts through an inquiry approach to the teaching and learning of science. This contrasts sharply with what is valued in the aims of the courses and the *Shape of the Australian Curriculum: Science.* Students should be making connections between the content and their lives and be able to evaluate information critically.
- Currently the content descriptions are mandated, with no options to enable teachers to tailor the learning to the interests of their students. The science curriculum course is overly prescriptive. The only flexibility seems to be in the choice of investigations and experiments that can be undertaken. This is at odds with the flexibility of the senior English and history curriculums. There needs to be room for more choice.
- If the courses are to be completely prescriptive, then the sequencing needs to be logical and coherent. This is not currently the case.
- Content descriptions lack a parallel form. There is significant variation in their specificity. Some are fine-grained, whereas others are very broad and general.
- The intent of mandating an extended experimental investigation in the senior secondary science curriculum aligns with Queensland's current science syllabuses. However, the purpose, place, characteristics, and magnitude of these investigations have not been specified in the curriculum.
- When points in strands are linked, they often mandate that the same concept is to be taught in two or three different ways. For example, in the "Science understanding" strand of Unit 2 of Physics, two examples of the concept "resonance" are specified for study:
  - resonance in microwave ovens to heat food
  - the greenhouse effect as a consequence of the resonance frequencies of molecules in Earth's atmosphere.

  This contextualisation of "Science understanding" blurs the lines with "Science as a human endeavour".
- There is repetition in many content descriptions. For example, in the "Science as a human endeavour" strand in Unit 2 of Earth and Environmental Science, there are two statements that are identical in intent:
  - "earth and environmental science methods that are being used in early warning systems for disaster prevention as a result of explosive volcanic eruptions, earthquakes, meteor collisions and tsunamis"

- "the interdisciplinary nature of contemporary applications of earth and environmental science in the development of technologies for monitoring the earth in an effort to minimise loss of life from earthquakes, volcanic eruptions and tsunamis".

- Proposed investigations must relate to the content descriptions of the unit and the context of any proposed examples.

Way forward

- Reduce the amount of content.
  - The excessive list of content should be reduced to key concepts which need to be taught. It is feared that too much content will result in teachers reverting back to teacher-centred pedagogies.
  - Do not mandate all the content descriptions for "Science as a human endeavour". Rather,provide opportunities for choice by mandating a minimum number of them be used as a source of stimulus for developing context-based work that will develop students' content knowledge as prescribed in "Science understanding". In doing so, flexibility and choice would allow teachers to develop contextualised teaching and learning experiences that take into consideration school and local resources and expertise.
- There are principles of scientific inquiry that are common to all the sciences. Such generic science inquiry skills should be framed upfront, to underpin all the science courses rather than be repeated for every unit. This will make the content descriptions for each unit more manageable.
  - Where course- and unit-specific science inquiry skills are appropriate, these should be developed. However, they should not be artificially constructed to show a difference of depth or intent when there is none.
  - Remove the examples of possible investigations and experiments from the "Science inquiry skills" strand. These would be better placed in the resources section of the online curriculum together with a list of ideas for field trips. State clearly that the list provides suggestions that are not prescribed and that the list is not exhaustive.
- Address the concerns, confusion and uncertainty around the extended experimental investigations (EEI).
  - Rename the task; currently the term Extended Experimental Investigation has different meanings for different states and territories. The number of investigations required each year is unrealistic if the Queensland understanding of an EEI is applied. Queensland teachers currently view these as the assessed extended experimental investigations which are required to be done once a year in Biology, Chemistry and Physics, and have specific conditions and requirements.
  - Give a clear definition in terms of the purpose of an EEI task and the expectations. For example, are the tasks completed individually or in groups? What length of time is expected for the task? To what depth should they be completed? What resources would be required? Is each investigation topic a choice for the student or directed by the teacher?
  - Ensure that rural students are not disadvantaged by lack of access to facilities and resources.
  - Explain EEI tasks in terms of a research model that identifies the specific science inquiry skills to be addressed.
  - Include options for field work and/or research investigations which have a primary focus on the analysis of both primary and/or secondary data. That is, the extended investigation could be an experiment in which primary data is gathered and analysed, or a research report based on the analysis of secondary data.

5.4.1 Biology

- Science inquiry skills, field work and extended experimental investigations are given a high profile. This is the most positive aspect of the course.
- Many students choose to study Biology because they are interested in human physiology, so there was seen to be value in beginning the course with cell biology, as it lays the foundations for studying processes which occur in body systems, such as osmosis and diffusion. The inclusion of more human physiology in the course makes it appropriate for students' needs.
- The attempt to have students study "modern" biological concepts such as gene therapy is a strength.
- The inclusion of biotechnology (however, some schools may face resourcing challenges) is welcomed.
- The inclusion of the "Science as a human endeavour" strand highlights the importance of applications of science to real-world situations.
- The continuation of the three strands from K(P)–10 is a strength.
- Cross-curriculum dimensions are appropriate given the nature of the Biology, for example:
  - Aboriginal and Torres Strait Islander perspectives are evident in the study of Australian flora and fauna
  - sustainability is evident in ecology topics.
- Field work is mentioned in all four units but the draft curriculum does not specify the extent, nature or duration of this work. Is it required or appropriate for each unit every Semester? Could the timing of field work lead to venues being overrun?
- Some of the sequencing of content and of skills, particularly in Units 1 and 3, is poor.
- The content-heavy nature of the course could lead to teachers reverting to teacher-centred pedagogies.
- There are concerns with the balance and structure of the course. There is too much emphasis on cell biology and not enough focus on ecology, systems of the body and classification. Most of the key concepts related to human physiology and classification are missing from this course.
- The physiology of animals appears to be incomplete. There is no explicit mention of different body systems, such as the digestive, respiratory, circulatory and excretory systems. Coordination and control (homeostasis) involving the nervous and endocrine systems are included. If this is a complete Biology course, this should be rectified.
- Adaptation is mentioned in Unit 1, without direct reference to these systems. This also applied to the study of plants.
- The inclusion of some obscure content is questionable, for example, current research into relationships between accidents and head injuries.

Way forward

- Revise content descriptions, for example:
  - two of the four units (Units 1 and 3) are focused on cell biology at the expense of other content. Content descriptions about human reproduction have not been included
  - opportunities for ethical discussions and recognising the contributions of Australian scientists need to be explicit

  - in unit 2, content descriptions should address the significant concepts of tolerance limits, niche separation, physical gradients, zonation and succession.
- More effective sequencing of content and development of skills needed, particularly in Units 1 and 3.
- Address the following Unit 1 concerns:
  - mitosis, heredity and DNA replication are repeated in Unit 4
  - the two subtopics in "biotechnologies" regarding reproduction are more appropriate in Unit 4
  - the topic on "structural, functional, and behavioural adaptations that enhance an organism's survival" overlaps with Unit 2 and Unit 3
  - the adaptations of organisms is dealt with in Unit 1 before the understanding of ecology and ecosystems in Unit 2
  - students have not seen any reproduction since year 7 (ACARA K(P)–10), this will present problems.
- Address the following Unit 2 concerns:
  - the four topics that focus on Evolution would be more appropriate in Unit 4
  - it is difficult for students to develop an understanding of Evolution and issues such as selective breeding, cloning and human evolution without first gaining a firm grasp of Genetics and Inheritance, which are included in Unit 4.
- Address the following Unit 3 concerns:
  - the unit title "Cells and systems in action" implies a study of body systems; however, the unit appears to be more focused on coordination and control within organisms
  - the concepts of enzymes and energy in cells would be more appropriate in Unit 1
  - the content descriptions for immunology are not pitched appropriately; currently they are too high level and detailed
  - content overload; this unit has much more content than other units.

5.4.2 Chemistry

- The sequencing on the whole is reasonable.
- Most of the content is applicable to the level of student learning.
- The continuation of the three strands from K(P)–10 is a positive aspect of the course.
- The inclusion of "Science inquiry skills" is valued; encourages the teaching of chemistry through an emphasis on scientific inquiry.
- The inclusion of "Science as a human endeavour" places an emphasis on scientific issues, historical perspective and students can see the relevance of science to everyday life.
- The Chemistry course articulates well from the K(P)–10 science curriculum.
- The cross-curriculum dimension of Sustainability is well defined in this course.
- There is too much content. The mandating of the content descriptions in "Science understanding" and "Science as a human endeavour" will make it impossible to complete all of the content and will result in superficial coverage.
- There is no spiralling or scaffolded development evident throughout the course. Key ideas and concepts are not clearly structured and the opportunity to revisit them is not provided. This is essential to ensure depth of understanding.

- The content descriptions of Unit 2 are applications of Unit 1 and these units should be combined, refined and grouped into the big ideas of chemistry to create a year-long course (as modelled in the K(P)–10 science curriculum).
- The unitised nature of the course is problematic. It will be difficult to develop a cohesive sequence of units of work over a year that provides the means for students to explore systematically the key concepts of Chemistry.
- Alignment across the three strands is not obvious.
- The statement that "all strands are of equal importance" is missing from the draft.
- It is not clear that the content of Units 3 and 4 is developmentally more challenging than the content of Units 1 and 2.
- Support materials for "science as a human endeavour" are needed. For example, resources for teachers on philosophy of science, history of science, people in science, tentative nature of scientific knowledge, how science is different from other pursuits.
- Similarly there is concern about the resources required to teach prescribed areas that have not been taught previously such as organic chemistry synthesis.
- The cross-curriculum dimensions of Aboriginal and Torres Strait Islander perspectives and Asia and Australia's engagement with Asia need to be more explicit in the content descriptions.

Way forward

- Use verbs in "Science understanding" and "Science as a human endeavour" to assist teachers in appreciating the depth of treatment required for the content.
- Rewrite the curriculum to be a year-long course. This will allow teachers the flexibility to develop a cohesive sequence of units of work over the year, and provide the means for students to explore systematically the key concepts of Chemistry. Students will be more likely to develop sophisticated understandings of the connections between the content and their lives and to develop higher order thinking skills.
- Identify alignment across the three strands by rearranging content into a tabular format to show clearly the linkages.
- Content descriptions need to be contextualised and consistent across the strands, with examples.
- Content descriptions should address the topic of nuclear chemistry and the related terms of radioactivity, nuclear reactors, fission and types of radiation in Unit 3.
- Clarify the relative importance of each strand.

5.4.3 Earth and Environmental Science

- The majority of content was favourably received.
- There is a good balance of geology and environmental science. The mining sector is of importance to Queensland and the emphasis on geology is noted and applauded.
- Earth Science and Environmental Science aspects need clarification.
- The inclusion and sequencing of elements in the scientific inquiry is unsatisfactory.
- The potential of the three strands was recognised, that is, the curriculum values investigation and science as a human endeavour.
- The rationale is overly simplistic in describing Earth and Environmental Science in terms of biology, chemistry and physics.

- "Science understanding" content does not directly link to the specific science inquiry skills often enough.
- An emphasis on systems will help to connect the geology and environmental aspects.
- Sustainability and renewable energy needs to be more overt.
- Content descriptions for "Science as a human endeavour" are often expressed as affective objectives, making them very difficult to assess in their current form.
- Extractive and resources industries seem to have a very minor place in the curriculum, yet this topic provides a perfect opportunity to teach both Earth Science and Environmental Science perspectives.
- Palaeontology seems to be over-emphasised. No mention is made of the principles and processes of stratigraphy (i.e. uniformitarianism, actualism, superposition, etc.) that are crucial to understanding the construction of the geological timescale and the fossil record.
- The "Science understanding" strand of Unit 3 seems to be limited to a collection of facts. Important conceptual and scientific processes are missing. For example, stratigraphy, interpreting and predicting physiological function and behaviour from fossil evidence.
- The collection of suggested experiments for Unit 3 is, by comparison with the other units, too short and narrow.

Way forward

- The rationale is overly simplistic in describing Earth and Environmental Science in terms of biology, chemistry and physics. The rationale needs to focus on the specific disciplines such as, geology, meteorology, oceanography, astronomy, stratigraphy and palaeontology.
- Content needs to be reduced and rearranged; repetition needs to be removed.
- Content descriptions should:
  - be more sequential
  - make connections explicit between key ideas
  - progress from simple to more complex concepts
  - show the connections and interrelatedness of each strand
  - feature a balance of Earth Science and Environmental Science
  - not repeat the same content. For example, in Unit 2, "Science as a human endeavour", there are two statements that are identical in intent:
    - earth and environmental science methods that are being used in early warning systems for disaster prevention as a result of explosive volcanic eruptions, earthquakes, meteor collisions and tsunamis
    - the interdisciplinary nature of contemporary applications of earth and environmental science in the development of technologies for monitoring the earth in an effort to minimise loss of life from earthquakes, volcanic eruptions and tsunamis.
- Specific science understanding content needs to be directly linked to the specific science inquiry skills.
- Units should:
  - integrate the Earth Science and Environmental Science aspects
  - ensure consistent cognitive demand
  - clearly outline the focus of the unit and an explanation of the why the units must be taught in a particular order.
- The cross-curriculum dimensions need to be:
  - relevant to the course
  - more effectively woven into content descriptions, for example, Indigenous knowledge for caring for the environment could be explored further.

5.4.4 Physics

- The course represents the discipline of physics and is intellectually challenging.
- This course will prepare students for tertiary studies.
- The inclusion of "Science as a human endeavour" and "Science inquiry skills" is a strength.
- The inclusion of contemporary physics is a strength.
- There is far too much content. It appears that the Physics course is more content overloaded than the other senior sciences, which themselves are too content-heavy. Yet there is limited guidance on depth of study for each topic.
- This prescriptive course will affect flexibility in developing work programs related to school context, and available physical and human resources.
- When points in strands are linked, they often mandate the same concept to be taught in two or three different ways. For example, in the "Science understanding" strand in Unit 2 of Physics, resonance is one of the concepts to be taught. The Science understanding strand specifies two examples to be taught:
  - resonance in microwave ovens to heat food
  - the greenhouse effect as a consequence of the resonance frequencies of molecules in Earth's atmosphere.

  This contextualisation of "Science understanding" blurs the lines with "Science as a human endeavour".
- There is little consistency in the approach of each unit, for example, some units are context based and some are content based.
- The course organisation provides little advice on how it is intended that the course is to be delivered.
- The content descriptions do not make connections explicit between key ideas or show the connections and interrelatedness of each strand.
- The units are very poorly sequenced. There is an overwhelming and eclectic mix of content. For example:
  - Unit 3 is a whole semester on Space Science, which is an over representation — it should build on the work in Unit 1
  - much of the space content in Unit 3 is non-essential (life cycle of a star, variations in stars and significance of the Sun)
  - electricity content such as AC and DC motors occurs in Unit 4 yet other directly related electricity content — AC rectification — occurs in Unit 1.

  These are just a few examples of a problem that permeates the entire senior physics course.
- Unit 4 is ill conceived. "Physical models and relationships" are the foundations of physics yet this is presented as a unit at the end of a physics course.
- The cross-curriculum dimensions are not explicit in the curriculum.

Way forward

- Introduce flexibility by defining an underlying core with the opportunity for schools to select from a range of options. Stem wording such as the following from Unit 1, "Science understanding":
  - "The laws and equations which describe linear motion, including …"

  - "The relationship between voltage, potential difference and current for materials, including …"

  could become:

  - "The laws and equations which describe linear motion including a selection from …"
  - "The relationship between voltage, potential difference and current for materials, such as …".
- Provide consistency in the approach of each unit.
- Course organisation needs to provide clearer advice on:
  - the intended sequence of the units that supports conceptual development
  - the role and focus of each strand
  - how the strands are to be taught, for example, should the strands "Science as human endeavour" and "Science understanding" be taught together?
  - how key concepts are addressed across the strands and the two-year course
  - status and expectations for each dot point, for example, should they be taught separately or integrated?
- Content descriptions should:
  - make connections explicit between key ideas
  - progress from simple to more complex concepts
  - show the connections and interrelatedness of each strand
  - address the significant topics of Thermal physics and Gas laws
  - include concepts associated with equilibrium, structural stability, stress and pressure, tension and compression, rotational dynamics, moment and torque
  - include the sound and physics of music in the unit Waves and Nuclear Physics
  - limit the amount of Space Science to be taught
  - be reviewed for appropriateness given the overall amount of content in the course
  - include reference to computing skills there should be an emphasis on using different technologies
  - include reference to the selection of appropriate equipment.
- Physical models and relationships should be percolated through all units.
- Many of the specific models could then serve as possible contexts within the Human endeavour strand.
- Remove the Unit "Physical models and relationships", and better sequence the content in all the units in order to create a new unit on "Electromagnetism and Quantum Theory".

5.5 Other considerations

- The online curriculum should include a mechanism to view the three strands side-by-side so that the connections between the strands in any given unit are clear.
- Remove the examples of possible investigations and experiments from the "Science inquiry skills" strand. These examples would be better placed in the resources section of the online curriculum together with a list of ideas for field trips.
- State clearly that the examples of investigations provided are suggestions that are not prescribed and not exhaustive.
- Ensure there is balance in the type and number of examples provided for each unit for each course. It is essential that students have the opportunity to engage in experimental work that is genuinely challenging and supports conceptual development in every unit.

6. Works cited

Hackling, M 2005, *Working Scientifically – Implementing and Assessing Open Investigation Work in Science,* Western Australia: Department of Education and Training.

Luke, A, Weir K& Woods A 2008, *Development of a Set of Principles to Guide a P-12 Syllabus Framework,* Queensland Studies Authority, Brisbane, <www.qsa.qld.edu.au/downloads/publications/qsa_p-12_principles_dev_ppr.pdf>

Young, M (1998), *The Curriculum of the Future*, Farmer Press, UK.

ACARA 2009, *Curriculum Design*

ACARA 2009, *Shape of the Australian Curriculum*

ACARA 2009, *Shape of the Australian Curriculum: English*

ACARA 2009, *Shape of the Australian Curriculum: History*

ACARA 2009, *Shape of the Australian Curriculum: Mathematics*

ACARA 2009, *Shape of the Australian Curriculum: Science*

Queensland Studies Authority

154 Melbourne Street, South Brisbane

PO Box 307 Spring Hill QLD 4004 Australia

T +61 7 3864 0299

F +61 7 3221 2553

www.qsa.qld.edu.au