



**Review of the Australian Curriculum
AAMT Submission**

February 2014

Submitted by

Prof. Kim Beswick, President AAMT



Contact Officer

Will Morony, CEO AAMT

AAMT
GPO Box 1729
ADELAIDE SA 5001

T: 08 83630288
M: 0419944910
E: wmorony@aamt.edu.au

Executive Summary

This submission to the Review of the Australian Curriculum from the Australian Association of Mathematics Teachers Inc. (AAMT) is made on behalf of its members.

The following summarises the key points of the submission under headings that represent the foci of the review.

Process of development

AAMT's experience of the curriculum development process was positive, being characterised by:

- being open and transparent;
- consisting of rounds of consultation;
- drawing on the knowledge and expertise of the wide range of stakeholders;
- respecting all input by considering it carefully and providing an explanation of why / why not the advice has been accepted; and
- having sufficient time to do the job well, including the consultation.

ACARA staff were found to be professional, approachable and genuinely committed to finding consensus that was in the best interests of students and their mathematical development.

The Australian Curriculum: Mathematics

Given the inclusive and thorough process used, the documentation of the AuC:M (Shape Paper, Curriculum itself) is 'as good as we could get'. The results of the independent benchmarking of the AuC:M against curriculums in Finland and Singapore support this view. There is no doubt that there may be areas that can be improved over time, but any changes to the content and its sequencing at this time would constitute revisiting issues that were resolved in the development process.

The AAMT therefore strongly recommends that the content of the AuC:M not be adjusted at this time. To do so would be a deflection from what AAMT sees as the key priority for the next few years – effective, nationally consistent implementation of the current AuC:M in classrooms around Australia that is well supported by governments and school systems. That will include sustained attention and effort to increase the content and pedagogical knowledge and skills of current and future teachers of mathematics at all levels – improving the quality of teaching in the context of the AuC:M must now be our collective focus.

Monitoring, review and revision of the AuC:M

ACARA should work collaboratively with the jurisdictions and the profession to develop and commence a rigorous process of monitoring, evaluation and review to gather the evidence that will inform a major redevelopment of the AuC. This process should run in parallel with the concerted effort to implement the AuC:M outlined above. It will inform, and be informed by, the efforts to implement the AuC:M.

The full submission provides more detail around these conclusions.

Background

The Australian Association of Mathematics Teachers Inc. (AAMT) (see Appendix 1 for an outline of the Association and its work) welcomes this opportunity to provide input to the Review of the Australian Curriculum. The Association has been active in presenting its members' views as the Australian Curriculum: Mathematics (AuC:M) has been developed and is now being implemented.

As a national organisation, AAMT sees great merit in all members and others throughout the country being 'on the same page' in terms of the mathematics being taught in schools. Teachers of mathematics around the country have begun to benefit already, and AAMT looks forward to further advances as a result of having a common curriculum.

Australia's young people deserve the best possible curriculum and this needs to be matched by a long term commitment to supporting the effective and nationally consistent implementation of that curriculum.

AAMT Position Papers and other relevant public statements

AAMT made clear its position in relation to the development of the Australian Curriculum at the start of the process:

- a statement of the position commonly held by the national associations in the four initial subjects being developed (English, mathematics, science and history) in June 2008 (see Appendix 2); and
- an AAMT Position Paper with specific reference to the development of the Australian Curriculum: Mathematics (see Appendix 3; 2008).

In August 2013, AAMT President Prof. Kim Beswick wrote to Mr Rob Randall, CEO of ACARA to relay some feedback from participants in the July AAMT conference, and to signal some issues from the AAMT perspective – including that of review and redevelopment of the AuC:M. Prof. Beswick included a strong endorsement of the constructive relationship that has characterised AAMT's involvement in the work led by ACARA on the AuC:M to date, adding that:

I believe that AAMT has maintained a positive and constructive approach that has been driven by our members' best interests, and look forward to continuing collaboration between AAMT and ACARA as we strive to do the best for our young people over the next four years and beyond.

In late 2013 AAMT released its Position Paper on Reviewing and Revising the Australian Curriculum: Mathematics. This paper is referred to extensively in this submission and is attached at Appendix 4.

Note: In this electronic version of the AAMT Submission, these Appendices include the text only of the documents without associated graphics. This was done to minimize the size of the document. Full versions of the Appendices will be included with the hard copy Submission to follow.

Responses to the Terms of Reference

The development and implementation of the Australian Curriculum.

Development

As suggested above, AAMT experienced respectful involvement by ACARA as one of the many groups of stakeholders actively involved. The writers and various expert groups appointed were all people with sound reputations in the field of school mathematics.

There was extensive and extended consultation on both the F-10 and Senior Years mathematics curriculums. There were several formal and informal rounds of consultation for each. The stated intention for this was for all positions and views to be heard and considered, and AAMT's experience – and evidence from others – is that this was achieved. AAMT found the leadership and mathematics staff of ACARA (and the former National Curriculum Board) to be thoroughly professional in their approach.

Implementation

Successful implementation of the AuC:M is AAMT's key concern at this time. We see the success of implementation as critically dependent upon appropriate support for teachers. The AAMT 2013 Position Paper states:

Noting that the curriculum has potential to inform teacher planning and assessment, AAMT believes that teachers need support in using the curriculum content descriptions to identify important mathematical ideas, to match tasks with the curriculum, to identify the purposes and affordances of tasks, to use achievement standards, and to assess learning of the proficiencies.

AAMT believes that all teachers need to renew their mathematics content knowledge progressively, but that some teachers have important and urgent need for support in processes for learning new mathematics. AAMT believes that some aspects of this learning should be provided online with teachers able to access that learning as they need it. This would have two benefits: first is equitable access to the support for all teachers; second is that the learning can be "just in time".

Sustained and extensive targeted professional support is required – it is the key to realising the potential of the AuC:M to improve student learning. The Commonwealth Minister for Education has a clear leadership role in ensuring the provision of the support that is needed.

AAMT has been able to contribute to providing resources to assist teachers with implementing the curriculum through its involvement in two national projects.

The *Supporting the Australian Curriculum Online* (SACOL) project that was coordinated by Education Services Australia (ESA) enabled AAMT to produce and disseminate a set of high quality professional resources to support the implementation of the AuC:M (see topdrawer.aamt.edu.au or contact AAMT for more details). The materials developed in the *Top Drawer Teachers* project are targeted at key areas of mathematics content highlighted through extensive consultation in the field as needing support. The current *Top Drawer Teachers* materials represent a significant but relatively small fraction of what AAMT would like to provide for teachers of mathematics in this context.

In addition, AAMT is currently undertaking the *Connect with Maths* project through funding from the Department for Education (2012-16). Designed also to assist implementation of the AuC:M, *Connect with Maths* is building collaborative online professional communities of teachers of mathematics in key areas of teaching (see <http://www.aamt.edu.au/Activities-and-projects/Connect-with-Maths> or contact AAMT for more details).

Both these genuinely national initiatives are achieving good results that would be able to be extended with further funding. This is in line with the 2013 AAMT Position Paper:

AAMT and its Affiliates have developed substantial expertise on ways of delivering resources to teachers, and the development of interactive online teacher learning and support, and are ideally placed to contribute to providing support for all teachers.

AAMT supports the current content of the AuC:M and recommends elsewhere in this submission that changes to that content not be made until after a thorough process of monitoring and evaluation over several years. One outcome of effective implementation of the AuC:M will be the

development of a range of different ways of approaching the prescribed content by teachers working within their own classroom contexts. It will be important to capture the best of these as they will, effectively, add to the collection of Elaborations that are designed to help teachers and schools identify ways to teach the AuC:M.

It is the clear view of the ACARA Board that implementation of the Australian Curriculum is the responsibility of the states and territories. AAMT views the disparities that are emerging as the jurisdictions undertake the implementation of the AuC:M as detracting from realising the full potential of having a national curriculum. The AAMT 2013 Position Paper makes this clear:

AAMT expects education authorities to collaborate to minimise individual state customisation of the curriculum, the documents, assessment and reporting processes, associated resources and processes for implementation.

The differences across jurisdictions referred to in the Position Paper relate to the implementation of the F-10 curriculum. Given that the Senior Years curriculum has a longer lead time for implementation the situation is not as clear. However, early indications are that even more pronounced differences will emerge unless the jurisdictions agree to minimise these in line with AAMT's position. AAMT urges the Minister for Education to work with his state and territory colleagues to achieve this minimisation of difference in the implemented AuC:M to ensure that all Australian students have access to the same robust mathematics curriculum.

The reviewers will consider the robustness, independence and balance of the Australian Curriculum

Robustness

AAMT believes that it is not possible to make any sensible assessment of 'robustness' of the AuC:M until the curriculum has been in action for several years. A robust curriculum would:

- provide continuity as students progress from year to year, and especially across transition points;
- provide effective preparation of students for work and further education;
- avoid differential performance of groups of students that are due to the construction of the curriculum;
- be relevant and useable in all Australian school contexts; and
- be demonstrably research-based and world standard.

Evidence around these and many other matters will only be accumulated over time.

Independence

It is not clear what the criteria for 'independence' for AuC:M might be, or, indeed, whether it is a desirable characteristic. The AAMT believes that the AuC:M should be strongly connected to (ie dependent on) what is its current key driver – developing the 21st century mathematical knowledge and skills required by our young people as future citizens and workers.

If the concern is about 'independence' from undue influence of one or other jurisdiction and its existing curriculum, or of particular interest groups, then the rigorous process of consensus building that characterised the process of developing the AuC:M is important to note. That process is an example of how to achieve this kind of independence. Views were sought and heard, with judgements made on the basis of assessment by experts in the field regarding what was best for students' mathematical development.

Balance

The concept of 'balance' is not singular – a successful, world class mathematics curriculum needs balance in relation to a number of different aspects. Important among these, it needs to balance:

- the need for a numerate citizenry with the needs of mathematics based higher education courses;
- the needs of students wanting to pursue mathematics study at university with those of young people not intending to do so in their post-secondary study; and
- the emphasis on mathematics content compared to mathematical thinking and ways of working i.e. the proficiencies.

Again, AAMT believes that the development process gives confidence that the AuC:M has achieved balance. However, whether it has achieved a suitable balance in terms of meeting students' diverse future needs and aspirations can only be assessed over time (as above re 'robustness').

Comments on matters for the detailed attention of the review

Process of curriculum shaping

The usual experience in Australia has been for the general framework and shaping for the overall curriculum to be determined in advance of detailed work in subject areas. Hence it was unusual that the development process for four subjects (English, mathematics, science and history) was well underway in advance of any detail of the overall design for the whole Australian Curriculum. This did lead to some inefficiencies. For example, the lack of clarity around the purpose and nature of the Achievement Standards led to some confusion and false starts in the development of the AuC:M.

However, there have certainly been instances in Australia and elsewhere in which developing the overall curriculum design as the first step has been time consuming and energy sapping. There is the risk that this approach can take a great deal of time as matters with little practical relevance are debated.

On balance, AAMT considers that the general shaping of the Australian Curriculum has been satisfactory, notwithstanding some frustrations experienced during that process.

In terms of the AuC:M, the AAMT 2013 Position Paper contains a clear endorsement of the Mathematic Shape Paper:

AAMT affirms its support of the principles of the Shape Paper, and that revisions of the Australian Curriculum: Mathematics and associated materials should focus on fostering depth rather than breadth, access by all students to the full curriculum for as long as possible, clarity in presentation, incorporation of the proficiencies into everyday planning, teaching and assessment...

The Mathematics Shape Paper provides a world class vision for mathematics in schooling. The extent to which its principles are achieved in practice must be a key consideration of the review of the AuC:M over the next few years.

Process of development

This matter is discussed above.

Process of monitoring, evaluation and review.

Planning the processes for monitoring, evaluation and review has been a part of AAMT's concerns since the very beginning of the development of the AuC:M. In the AAMT 2008 Position Paper, one of the principles for 'developing and renewing a national curriculum' was:

To be successful a national mathematics curriculum should be universally supported. In order to achieve this:

...
the process for development should specify an ongoing process for quality assurance, review and renewal over time that incorporates meaningful consultation with people from the groups (teachers of mathematics, mathematicians, mathematics education researchers and educators, mathematics curriculum writers, industry and professions, parents and community) at the state, territory and national level.

Such is AAMT's commitment to this as part of achieving the intentions of the AuC:M that the 2013 Position Paper focusses on review and revision of the AuC:M.

AAMT believes that the Australian Curriculum: Mathematics should be a dynamic document that is reviewed and revised regularly and cumulatively in response to feedback from practitioners and professional associations. The consultations associated with these reviews should be open, and based on rigorous evaluation of the various elements in the curriculum.

AAMT expects that the processes and timelines for these reviews, and the means for managing and responding to feedback, will be identified and publicised by ACARA.

AAMT hopes that the current review will ensure that purposes, processes and timelines for review and redevelopment of the AuC:M are agreed, developed and publicised by the middle of 2014. The review and analysis process should take several years from now to allow for relevant data on the effectiveness of the curriculum to be gathered as the basis for evidence-based changes.

Advice on the design and conduct of the review of the AuC:M is outlined below.

Curriculum content from Foundation to Year 12 for subjects mathematics

AAMT believes that the development process has resulted in an AuC:M that is the best that can be achieved in the current context. International practices and documents were analysed to inform the development of the AuC:M. There was extensive reference to local and international research to help resolve issues. There has been extensive consultation and careful writing and rewriting by acknowledged experts representing a diversity of perspectives (e.g., teachers of mathematics, mathematicians, mathematics education researchers).

Those teachers who have engaged with the current document seem to be broadly satisfied that it is a curriculum with which they can work provided they receive appropriate support. Any tinkering with the current versions in the absence of clear evidence from practice and student achievement to support those changes would be viewed negatively by AAMT and among the teaching force.

The process of developing the F-10 AuC:M resulted in careful scrutiny of each piece of content and the sequencing. The processes of monitoring and review over time need to identify whether the current content is appropriate and how it may need adjustment. Several key questions need to be addressed, including:

- is the curriculum still too crowded, with teachers unable to focus on depth rather than breadth, as stressed in the mathematics Shape Paper?
- do the implied requirements of senior years mathematics subjects skew the emphases in F-10 away from the needs and aspirations of the majority of students?
- how consistent are teachers' judgements against the Assessment Standards?

The selection of content in the development of the current Senior Years AuC:M was made more problematic than for the F-10 for several reasons including:

- the differentiation of mathematics subjects in the Senior Years to suit different future pathways; and
- the possible scope of the mathematics content that could be included in the curriculum at these year levels.

As a result there are likely to be differing views on the suitability of the content in the Senior Years AuC:M. In fact, AAMT has provided feedback that, in its view, the needs of vocationally oriented young people are not adequately met in the current four subjects. That view did not prevail. Although AAMT is concerned about this aspect of the curriculum content, the Association accepts the consensus view. The resolution of the question of meeting the needs of vocationally oriented students can then be based on the data gathered about the AuC:M in action over the next several years.

Advice to the reviewers on their recommendations to the Commonwealth Minister for Education

The following areas have been identified as those in which the reviewers will prepare recommendations for government.

The curriculum shaping process followed by Australian Curriculum, Assessment and Reporting Authority (ACARA) to ensure that the curriculum is balanced and offers students an appropriate degree of choice and diversity.

The Shape Paper for mathematics provides a clear direction for mathematics that has widespread support across the mathematics 'community'.

The process of curriculum development to be followed by the ACARA for the development and revision of all future curriculum content.

Given the experience reported above, AAMT advises the reviewers to recommend that the process of curriculum development be characterised by:

- being open and transparent;
- consisting of rounds of consultation;
- drawing on the knowledge and expertise of the wide range of stakeholders;
- respecting all input by considering it carefully and providing an explanation of why / why not the advice has been accepted; and
- having sufficient time to do the job well, including the consultation.

These have broadly been in place for mathematics to date, and may be able to be improved. AAMT expects that processes for further developments in mathematics and the other subjects in future will be at least as good as they have been to date.

The content in learning areas, Cross curriculum priorities and General capabilities of the Australian Curriculum

AAMT advises that the content of the AuC:M not be adjusted at this time but that its efficacy in terms of students' learning be monitored rigorously over coming years

On the matter of the Cross-curriculum priorities and the General Capabilities the AAMT 2013 Position Paper states:

AAMT endorses the intention of the General capabilities and Cross-curriculum priorities but notes that substantial work on the numeracy and critical thinking domains are needed if these are to inform teaching in mathematics and other areas in a positive manner.

AAMT advises that the descriptions of the Cross-curriculum priorities and the General capabilities remain unchanged until there is evidence, collected from classrooms and student assessments over time, that change is needed. However, support for teachers of mathematics and schools to effectively implement these components is required as part of the broader support for implementing the AuC:M. An important initial component of that support will be further documentation to demonstrate clearly how these components of the overall curriculum can apply to the teaching of mathematics. One source of this documentation will be the collection of ways that real teachers and real schools have been successful in integrating the General capabilities and Cross-curriculum priorities in to their effective teaching of the content of the AuC:M.

The ongoing monitoring, evaluation and review of curriculum content used by ACARA to ensure independence, rigour and balance in curriculum development.

AAMT advises that a program, timeline and processes for the monitoring, evaluation and review of the AuC:M be agreed by the ACARA Board as a matter of urgency. The timeframe should be several years.

There should be initial and ongoing consultation with stakeholders to determine the questions that frame the monitoring, evaluation and review of the AuC:M. Some, but certainly not all, of the large scale questions have been suggested above.

The review should draw heavily on evidence of the AuC:M 'in action'. This means that teachers' and schools' experiences and feedback are central to the review, as are local and systemic assessments of student achievement over time.

Any significant changes to the curriculum should be based on evidence gathered and presented in the review, with those changes subject to the same rigorous and principled process of consultation involving stakeholders over time as are already established in ACARA's ways of working.

This is the opportunity for Australian education to take a systematic, inclusive and evidence-based approach to reviewing and revising the mathematics curriculum. Our young people deserve this level of care and commitment.

Appendix 1

About AAMT

The Australian Association of Mathematics Teachers Inc. was founded in 1966 as a 'federation' of mathematics teacher professional associations in the states and territories. The AAMT is the nation's pre-eminent professional association in school mathematics and numeracy education. It exists to:

- support and enhance the work of teachers;
- promote the learning of mathematics; and
- promote progress in mathematics and numeracy education.

The nature of the organisation has enabled the AAMT to play a significant role of national leadership in mathematics and numeracy education over many years.

The Association's members come from all states and territories and all levels of government and non-government schools. They form an extensive network of committed and enthusiastic mathematics and numeracy education professionals including teachers, academics, policy leaders and administrators. Currently the Association has approximately 4,500 members — 2,400 of these are individual teachers. The rest are Institutional members (schools), this giving the AAMT direct contact with more than 25,000 teachers and others.

AAMT is a not-for-profit organization with tax exempt status from the ATO as a scientific organisation. The Association is funded through membership fees and its other activities. There is no annual funding from any government. Average annual turnover is more than \$2 million.

Through the work of its many volunteer members and highly skilled staff, the AAMT provides a range of services for teachers and schools that includes:

- Three refereed journals (primary, middle school and senior secondary);
- Annual Activities that promote the learning of mathematics by students and teachers, including the National Mathematics Day, National Mathematics Talent Quest and numeracy activities as part of National Literacy and Numeracy Week;
- An extensive catalogue of teaching materials for sale by 'mail order';
- Professional Development activities including electronic networking of teachers and Biennial National Conferences; and
- Projects to undertake research, and curriculum and professional development.

Appendix 2

Educating teachers...educating young Australians for the 21st century

A statement on national curriculum from the national peak professional associations in English (Australian Association for the Teaching of English; AATE), History (History Teachers Association of Australia; HTAA), Mathematics (Australian Association of Mathematics Teachers; AAMT) and Science (Australian Science Teachers Association; ASTA)

Preamble

We endorse a national K-12 curriculum that supports teachers in meeting the needs of students into the future. Development of a national curriculum should be positive and forward-looking, based on findings of current research. It should contribute to nation-building and Australia's long term social and economic prosperity in ways that acknowledge, harness and extend the creative potential of diversity.

But development of any curriculum cannot occur in isolation. In concert with a focus on the development of a national curriculum, substantial effort and resources need to be applied to addressing other pressing needs in Australian education. These include attracting and retaining well-prepared teachers; supporting teachers' professional work by providing extensive and high quality professional learning for teachers, and by developing and providing access to high quality teaching resources and technologies; and addressing the under-achievement of identifiable groups of students.

To be successful, this national initiative needs to have not only the input from, but also the ownership of the professional educators that will be charged with its implementation. The necessity of professional input to, and ownership of this program requires the direct engagement of teachers and other educators at all stages of its development and implementation.

Principles

A national curriculum should

- Be forward-looking whilst also valuing existing successful practices
- Be written for teachers, in consultation with teachers
- Support professional decision-making at the classroom level
- Allow flexibility to enable teachers to address the needs of their students
- Promote teaching practices that engage and challenge students
- Balance the following elements of authentic learning: the acquisition of knowledge, skills development, application, innovation and creativity

Recommendations

The National Curriculum Board should ensure that:

- The relevant subject associations have access to the Board in order to provide input throughout all stages of the process
- Writing groups are expertise based, with representation that includes teachers and academics
- Subject associations have representatives on expert writing groups
- Involvement of teachers in consultation must be adequately funded
- Teacher educators are kept aware of and involved in all aspects of the Board's work
- Ongoing evaluation and renewal of the national curriculum is built into the medium and long term



Mr Mark Howie
President AATE



Dr Judy Anderson
President AAMT



Mr Peter Turnbull
President ASTA



Mr Paul Kiem
President HTAA

Appendix 3

AAMT Position on National Curriculum in Mathematics

Preamble

High quality teaching and learning of mathematics in our schools is a matter of urgent national need. A high quality mathematics curriculum document as the 'intended curriculum' can contribute to this, but there are many pressing needs to ensure that the 'enacted curriculum' — what happens in schools and classrooms — is of consistently high quality across the country. In order to achieve internationally recognised standards of excellence in teaching practice and student outcomes, Australia must make a concerted and sustained effort and commitment of resources to:

- attract and retain well-prepared teachers;
- provide for the ongoing professional learning for all teachers of mathematics in the face of profound changes in the discipline and substantial development in our knowledge of how mathematics is learnt;
- actively and significantly reduce the differential performance of students that is based on factors other than their interest and potential in mathematics (eg city/country, Indigenous/non-Indigenous, high/low socio-economic status);
- develop and provide access to high quality teaching and learning resources and technologies; and
- ensure there is adequate time in the school week for students to learn the mathematics necessary for them as involved and productive people in the 21st century .

The work to develop a national curriculum in mathematics needs to be done in the context of a strong commitment to address these issues at the same time.

The AAMT Position

The AAMT supports a national curriculum for mathematics in Australian schools, provided the work (ie process and product) incorporates the following principles in relation to the:

- *mathematics curriculum itself*
- *purposes and audience of the national curriculum*
- *process for developing a national curriculum*

Principles regarding the nature of the national mathematics curriculum

Schooling should prepare students for their lives as global citizens. Their experiences with mathematics should provide the knowledge, disposition and confidence to use mathematics in their lives. To achieve this, a national mathematics curriculum should:

- acknowledge that all students can and should learn mathematics;
- focus on deep learning of the *Big ideas* and key *Mathematical Concepts and Actions*;
- encourage teachers to set high, achievable goals for their students;
- provide pathways to enable all students to maximise their mathematical learning;
- be flexible to assist teachers to elaborate on the curriculum to suit the needs of their students;
- be realistic in terms of expectations on teachers;
- provide a sense of scope and sequence; and
- be concise, explicit and written in clear and easily understood language.

Principles regarding the purpose and audience for national curriculum

A national mathematics curriculum should help teachers to teach well, and help students to learn well. To achieve this the curriculum should:

- be written for teachers (pre-school to post-compulsory);
- be separately elaborated in a document that communicates its values, purposes and approaches to parents and the wider community; and
- ensure that high quality resources and effective teaching practices developed anywhere in Australia can be used and adapted across the nation; and
- be the basis for subsequent national assessment that provides teachers with

diagnostic information.

Principles regarding the processes for developing and renewing a national curriculum

To be successful a national mathematics curriculum should be *universally supported*. In order to achieve this:

- the process for development should be open and transparent;
 - people with expertise and interest should be actively and purposefully engaged in the development of the mathematics curriculum, including:
 - mathematics teachers
 - mathematicians
 - mathematics education researchers and educators
 - mathematics curriculum writers
 - industry and professions
 - parents
 - community
 - the process for development, and the curriculum statement itself, should allow for transition from the current setting where there are local differences in curriculum, teachers' content knowledge and teaching practices to national consistency;
 - the process for development should specify an ongoing process for quality assurance, review and renewal over time that incorporates meaningful consultation with people from the groups (above) at the state, territory and national level
- To be successful a national curriculum should be *properly funded*. This means that:
- the total current funding across the nation on curriculum development and implementation should not be reduced; and
 - funds released through adopting a singular, national curriculum should be used for on-going quality support of teachers and schools to implement the national curriculum and ,in particular, to elaborate on the curriculum for the needs of their students.

To be successful the national curriculum should be *internationally respected and well regarded*.

This means that the writers of the national mathematics curriculum should:

- be experts in mathematics education and experienced writers of mathematics curriculum for teachers;
- be able to draw on high quality research on mathematics teaching and learning; and
- have a thorough¹ understanding of mathematics, its structure, history and emerging directions as well as its place in, and relevance to, our culture.

¹ Knowledge that is profound in the sense meant by Liping Ma, Deborah Ball and others when discussing teachers' knowledge of mathematics

Appendix 4

AAMT Position on processes for reviewing and revising the current versions of the Australian Curriculum: Mathematics

(July 2013)

Overview

- AAMT continues to support the notion of a national curriculum and documentation for its effective use.
- AAMT expects education authorities to collaborate to minimise individual state customisation of the curriculum, the documents, assessment and reporting processes, associated resources and processes for implementation .

Review of the Australian Curriculum: Mathematics

- AAMT believes that the AC should be a dynamic document that is reviewed and revised regularly and cumulatively in response to feedback from practitioners and professional associations. The consultations associated with these reviews should be open, and based on rigorous evaluation of the various elements in the curriculum.
- AAMT expects that the processes and timelines for these reviews, and the means for managing and responding to feedback, will be identified and publicised by ACARA.

Emphases through implementation of the Australian Curriculum: Mathematics

- AAMT affirms its support of the principles of the Shape Paper, and that revisions of the documentation should focus on fostering depth rather than breadth, access by all students to the full curriculum for as long as possible, clarity in presentation, incorporation of the proficiencies into everyday planning, teaching and assessment, among others.
- AAMT endorses the intention of the General capabilities and Cross-curriculum priorities but notes that substantial work on the numeracy and critical thinking domains are needed if these are to inform teaching in mathematics and other areas positively.

Supporting the use of the Australian Curriculum: Mathematics

- Noting that the curriculum has potential to inform teacher planning and assessment, AAMT believes that teachers need support in using the curriculum content descriptions to identify important mathematical ideas, to match tasks with the curriculum, to identify the purposes and affordances of tasks, to use achievement standards, and to assess learning of the proficiencies.
- AAMT believes that all teachers need to renew their mathematics content knowledge progressively, but that some teachers have important and urgent need for support in processes for learning new mathematics. AAMT believes that some aspects of this learning should be provided online with teachers able to access that learning as they need it. This would have two benefits: first is equitable access to the support for all teachers; second is that the learning can be “just in time”.

Ongoing integration of AAMT and its members in national decision-making about mathematics curriculum

- Noting that AAMT and its Affiliates continue to foster on-going discussions on all issues associated with the curriculum through networks, conferences, teacher professional learning, journals and other publications, AAMT will have a central role in ongoing planning for implementation, ongoing review of the curriculum and teacher education and support.
- AAMT and its Affiliates have developed substantial expertise on ways of delivering resources to teachers, and the development of interactive online teacher learning and support, and are ideally placed to contribute to providing support for all teachers.