

## MAV Response to a Framework of 'Essential Learning' Curriculum Reform Consultation 2004

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## **General reaction to “A Framework of ‘Essential Learning’”**

The MAV can only agree with the overall sentiments expressed within the Framework, and that the ideas and intentions expressed seem to be worthwhile.

We believe that the Framework of ‘Essential Learning’ describes many aspects of the current practice of many good teachers and school communities across the State. The aim of the framework needs to be to extend this best practice to as many schools and their teachers as possible. This has been the aim behind, and the challenge facing most curriculum reform in the past. How can we guarantee that this Framework will be different and that it might work?

There is the danger with the introduction of such a Framework that, firstly, it will in fact not achieve what it sets out to do, and secondly it will create another layer of internal and external accountability problems for school communities and teachers.

### **Pedagogies not content**

Therefore, we are concerned about how such a framework can be developed to achieve its aim, especially in the crucial area of mathematics and numeracy education. Some of our concerns relate to the fact that much of the paper discusses subject knowledge and content, that is to be derived from the existing CSF, whilst avoiding the need to include in the framework the pedagogical and philosophical understandings that are at the core of good teaching. At the core of good teaching is an understanding of appropriate pedagogical approaches and a philosophical understanding behind their teaching. It seems that these aspects need to be included as well.

The general statements in the Framework of ‘Essential Learning’ about how this new emphasis on generic skills and values will be taught either implies that teachers already know how to do it (but are not doing it), or will work it out in a way that is appropriate to their community. This position does not seem logical when it is necessary to propound in great detail what is to be taught, unless there is an expectation (not stated) that a great deal of support will be provided to schools to achieve a curricular approach to teaching such values.

The same arguments apply to the subject knowledge of the curriculum, if teachers are to achieve different outcomes then they will need to teach in a different way. Is there an expectation that teachers already know how to do this? We’re sure that changes in outcomes for mathematics, as in all subjects, are very hard to achieve without the support for changes in teaching style.

Examples exist where a philosophical and pedagogical basis behind curriculum reform is made explicit. For example, one of the characteristics of the VCAL program is that its philosophical and pedagogical beliefs (i.e. Adult/Applied Learning) that lie behind the curriculum are made explicit and are spelt out in a number of ways in the curriculum framework and supporting materials and professional development programs.

In the Queensland Government’s ‘New Basics’ curriculum, one of three key elements in the program is what is called ‘Productive Pedagogies’. This spells out in some details **how** the curriculum is to be **taught**. This provides teachers with a set of recommended teaching strategies grouped under four categories: Recognition of difference; Connectedness; Intellectual quality; and Supportive classroom environment. This provides another model for addressing pedagogical guidance.

We would hope that the Framework of ‘Essential Learning’ will come to grips with, and address, the issue of espousing and including recommended pedagogical guidance for teachers. Without this advice it is hard to see how teachers can be expected to introduce change.

## **Overcrowding the curriculum and support for teachers**

The other danger with the introduction of such a Framework is that it will create another layer of demands on teachers and further external accountability tasks for school communities and teachers.

We believe that teachers are already overtaxed and often under-resourced and supported, and many have only recently become at ease with the demands of the CSF and related school assessment processes. The demands on teachers to implement such a new curriculum framework needs to be taken into account and professional development programs incorporated into any implementation plan and made a priority.

We don't want the description of a new set of outcomes for school education to mean that teachers have to teach a new set of content - it is important that any new generic or essential skills are in some way integrated across subject/content areas so they can be developed and applied within and across current subjects and curriculum areas. Otherwise the outcomes could be that there is no change, or even a deterioration, in some of the current KLAs.

## **Generic skills, including communication skills and cognitive and metacognitive skills**

Metacognition is an emerging aspect of curriculum provision in many schools. In particular, it is central to 'how a mathematician works'. We support the aim of integrating 'thinking skills' into all classrooms but caution that this will be effective only if it is adopted into every classroom. 'Thinking' therefore, needs to be a key teaching strategy that is modelled consistently by teachers and leaders. Mathematics has a key role to play in developing many of the cognitive skills listed in the Curriculum Reform Consultation Paper but again, teacher development will be required.

The list of 'cognitive and metacognitive skills' on page 9 is comprehensive and describes what we believe are essential and core characteristics of mathematical thinking skills. It will be therefore important to link these cognitive and metacognitive skills into the KLAs - that is bring them together in a unified and holistic way - not as a separate set of isolated "generic" skills to be taught, learnt and applied separately.

The naming of Communication skills as a core skill is supported, as it is crucial to any learning. However, we believe it can be taken and described too specifically and again possibly taught as a separate skill. It is something that needs to be spelt out as applying across all disciplines and all KLAs therefore. To say that Communication, in terms of mathematics, is: "mathematical representation including the use of number, data and spatial representation" is a very narrow and potentially dangerous view of the role of mathematics in communication. It will be important to spell out the many ways that communication is important within and across all disciplines - and in many ways this broad role that communication does play in the teaching and learning of mathematics is maybe one area of mathematics education that has been underplayed. It will be important therefore to get it right and use this framework to describe the role that communication and representation plays in mathematics and vice versa the role that mathematics plays in communication.

An instance of where a 'generic' skill has not been successfully integrated into subject areas nor been implemented within or across disciplines was the introduction of 'problem solving' as a key area of the maths curriculum. It became almost a separate skill and content area within mathematics (puzzle solving almost) - often divorced from other mathematics content and applications instead of being seen

It will be important that naming and describing lists of essential or generic skills does not lead to the teaching and learning of sets of disjointed and isolated skills.

## **Years 9 and 10**

We agree strongly with the comments that changes to teaching and learning at year 9 and 10 are needed to counter student alienation from schooling, and often maths is one of the subjects that

students find most irrelevant and uninteresting. We would, however not restrict it to years 9 and 10 alone. Approaches such as those being incorporated into VCAL may be worth considering in the development of mathematics curriculum in the middle years of schooling.

## **Assessment**

The consultation paper says the following about assessment:

In turn, the standards-based assessments will enable teachers to monitor and report students' progress over time. The standards-based assessments will provide teachers with comparative information about student achievement against statewide achievement levels and national benchmarks. At the same time, the focus of the new framework is to encourage deep understanding. Deep understanding needs to be demonstrated by students' ability to transfer knowledge and apply it to new contexts. The challenge is to develop assessment methods that genuinely enable students to demonstrate this.

The danger with the introduction of new assessment practices is that they will create another layer of internal and external accountability problems for school communities and teachers. We agree that it is vital that there is the need to “develop assessment methods that genuinely enable students to demonstrate this” - but these need to incorporate a wide range of assessment methods and tools, not a narrow set that don't allow the assessment of “deep understanding” or of the “students' ability to transfer knowledge and apply it to new contexts”. Again it may be appropriate to look at how this has been achieved in other arenas such as the Queensland Government's ‘New Basics’ curriculum, with its “Rich Assessment Tasks” and the processes being used within Victoria itself with VCAL.

## **What about mathematics?**

The MAV believes that mathematics is a core discipline that must be retained, indeed strengthened in any redevelopment of curriculum in schools. Queries about mathematics in the proposed structure include the identification of:

- the key elements of maths
- potential problems
- implications for mathematics teaching

## **What are the key elements of maths that need to be included**

Mathematics as a discipline is fundamentally about a range of cognitive and metacognitive skills, and as such fits explicitly into the Framework. Mathematics needs to be seen as a wide set of related skills and understandings that are developed from a social constructivist approach to learning and teaching.

Mathematics is not just a set of isolated skills, or a hierarchical sequence of abstract content, and/or a set of rules to be learnt by rote. Mathematical thinking and understanding needs to be developed and appreciated by ALL students under a holistic and cross curriculum approach where mathematics is seen as a useful and crucial tool in terms of learning about and understanding the world around us.

The key elements and potentials of good mathematics education include:

- the historical and cultural development of mathematics
- the development of a curiosity about mathematics, and hence a confidence in using maths
- the ability to think and reason mathematically
- the appreciation and understanding of the universality of mathematics
- the integration and application of mathematics across the curriculum and into students and their communities' lives
- the ability to be able to represent and communicate in a range of ways about mathematics
- the ability to reflect and be critical about mathematics.

All these aspects should be seen as “Essential Learnings” in mathematics education. There have been a number of new and innovative efforts to describe the essentials of mathematics education, both within Australia and overseas, and it would be hoped that these could be looked at in developing and describing the mathematical components of “Essential Learnings” in Victorian schools. The MAV can

provide references to these if requested and would be interested in being formally involved in the process of what and how the mathematical components of the “Essential Learnings” framework are described.

### **Dangers for mathematics education**

The consultation paper says the following about standards:

By focusing on what is central to each discipline, our intention is to provide schools with a clear understanding of what students should learn as they progress through schooling. At each level, a set of performance standards will be developed. School communities will be free to decide how and what to teach students to ensure these standards are met.

In mathematics one of the dangers of prescribing a progressive set of standards is that it has been one of the areas of concern in mathematics education - where a set of hierarchical content dominates the curriculum, where text books are written that are based along these lines and teachers teach to that structure. Fundamentally, students all develop at different rates and in different ways - utilising different ways of learning. Trying to align year levels against a set of spelt out set of standards, especially in terms of various aspects of cognition and metacognition could be dangerous and have a negative impact, especially in the earlier developmental years in (at least) Primary classrooms.

Another issue concerns the separation of maths from the rest of the school curriculum. Unfortunately, for a number of reasons, mathematics teaching within some schools can remain the separate and remote domain of the “Mathematics teacher(s)”. This can disadvantage both the maths teacher, as well as the other teachers and therefore the students and the wider school community. It is crucial that the Framework of ‘Essential Learning’ enhances and supports the value and integration of mathematics across the curriculum, whilst still supporting the uniqueness and importance of mathematics.

### **Concerns and implications for teachers of mathematics**

There are a number of specific issues concerning mathematics teachers that also need to be taken into account. This concerns the issue the history of traditional approaches to teaching maths and the issue of qualified and knowledgeable maths teachers.

We acknowledge that the current teaching of mathematics in schools still suffers from being relatively conservative and does not seem to meet the needs of most students. Too much mathematics teaching still focuses on a set of hierarchical content divorced from the world outside the classroom, where rules and facts are taught by memorisation rather than through understanding, and where text books and worksheets are the main resource used. This is not isolated to Victoria, but is seen as a national and international problem facing mathematics education. The challenge in mathematics education is to therefore change the practice within mathematics classrooms, so that the outcomes for all students improves. But this is another debate and too long to try to detail here. The main point here is that any new maths curriculum needs to support teachers in implementing classroom change - and this needs to be done by challenging their views of mathematics teaching and therefore providing them with alternative models and guidance - this returns to the need to include specific pedagogical advice and support to teachers.

Second, there is the issue of the quality and training of maths teachers. Most primary and some lower secondary level maths teachers are trained as generalists with some subject matter specialisation. Very few specialise in mathematics. This means that a fair amount of the mathematics teaching delivered at these lower levels is given by teachers who have a general orientation without much of a background in mathematics. On the other hand, mathematics teachers for the middle and upper secondary levels often have a rather solid background in academic mathematics, but may not have the same level of knowledge and expertise in the teaching and learning of mathematics. And this can be all exaggerated by the shortage of qualified mathematics teachers that exists at the moment. But what this means is that there is a large number of mathematics teachers who do not have an optimal background on which to teach mathematics. Therefore it is crucial that, as we have said now on a number of occasions, that the Framework of ‘Essential Learning’ comes to grips with, and addresses, the issue of espousing and

including recommended pedagogical guidance and advice for teachers. This can be both through supporting information associated with the Framework itself but also, crucially, through associated professional development and training.

As many of these issues and concerns relate to best practice in the teaching of mathematics, it would be appropriate to refer in the development of guidance to teachers to the Australian Association of Mathematics Teachers' set of Standards for Excellence in Teaching Mathematics in Australian Schools. These Standards and associated support materials describe the characteristics of excellent teaching of mathematics. The web address is: <http://www.aamt.edu.au/standards/>

## **Conclusion**

Whilst agreeing with the overall sentiments and aims expressed within the Framework we are concerned about how the Framework of 'Essential Learning' can be developed to achieve its aims, especially in the crucial area of mathematics and numeracy education. We have tried to outline these concerns within this response.

Our main overriding concerns are about how such a framework can be developed, written and implemented that would enable the aims and outcomes of the Framework of 'Essential Learning' to be implemented successfully in all schools, without it being a restrictive, constraining and demanding imposition on teachers and their school community and hence with little positive influence in improving education.

The MAV would be interested in the future in being formally involved in the process of what and how the mathematical components of the "Essential Learnings" framework are described.