

Supplementary
Submission
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INQUIRY INTO REVIEW OF THE NEW SOUTH WALES SCHOOL CURRICULUM

Organisation: Mathematical Association of NSW

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This is the MANSW response to the Chair's Discussion Paper for the Review of the NSW Curriculum.

How can curriculum reform reverse the decline in NSW school results?

This is a leading question with the assumption that the current curriculum is the cause of a decline. Curriculum reform is only a very small piece of the puzzle. Other elements include

1. Teacher education programs that are financially driven so that there is pressure to accept students who are not adequately prepared, for example lacking critical literacy and numeracy skills.
2. The lack of time and reward for teachers who undertake professional development.
3. Removal of prerequisites for entry to university courses.

Regarding (2), Singapore teachers have time for 100 hours of paid professional learning each year.

<https://asiasociety.org/global-cities-education-network/how-singapore-developed-high-quality-teacher-workforce>

We also note that if the suggestion is that PISA and TIMSS results are the only measure can we be sure that NSW results are compared appropriately? Are we comparing like with like? Care needs to be taken when comparing results of students on international tests as socio-economic circumstances are well known to influence test performance.

To return to the question however, there is agreement among mathematics teachers that the current curriculum documents for Stage 6 Mathematics are poorly written and require further review. The time required to move through the syllabus is not available to teachers.

How and what should teachers be teaching to lift student results?

Why is education so results driven? Why isn't the focus on student learning rather than content?

There seems to be too great a focus on recall and reproducing as a measure of learning, when in fact deep learning occurs when students move beyond facts to integrate their learning by making connections and being able to apply that learning in different and more challenging situations. This does not occur because there is a curriculum from which teachers, teach. Deep learning and better student results occur when a highly qualified teacher, who understands their students' academic and social needs is given the flexibility to support students where they are at in their learning, instead of having to ensure that their students pass a test.

It is fundamental that students should learn how to think critically, ask questions, explore, investigate while addressing syllabus outcomes through 'some' mandated content. This should include Australian History, Numeracy and Literacy. Focussing only on skills does not produce a society of citizens who are prepared to ask questions and are critical of statistics and leadership. What has the greatest impact on learning is the student's home environment, parent attitudes towards learning, socio-economic status, readiness and as students get older, motivation and self-belief. None of these are syllabus/ school based (Kern & Friedman, 2008). Motivation and self-belief can be influenced by teachers and their social persuasion, but this is the least effective form of influence on student self-efficacy or self-belief (Bandura, 1994)

Another MANSW member stated:

Particularly that the curriculum is over crowded and students cannot think creatively or critically in Mathematics because their working memory is so bogged down with calculating basic facts or recalling key ideas.

The greatest impact on student learning and student results is that excellent teachers can have an “exponentially more effective impact on their students’ achievement, even more pronounced in early education. As is commonly thought, students in the early stages of primary school who achieve at or above testing standards are much more likely to pursue higher education after mandated school” (Tucker & Stronge, 2005).

<https://academicpartnerships.uta.edu/articles/education/good-teachers-key-to-student-success.aspx>

MANSW members also raised points about resourcing:

*Teachers need the support and resources to do their job. Currently that is not available. In a comprehensive high school in western Sydney, the needs (social, emotional, medical, intellectual) are far beyond what a school can support. **Precious funds for learning are being spent on providing some support for students; support that should be coming from home or the wider community.***

*Resources - quality and size of rooms, still no air conditioning, budget for online resources, budget for keeping teaching resources aligned to curriculum changes, **funding for quality professional development, time** for authentic collaboration, funding to develop our leaders, funding to alleviate the administration from the most senior teacher in the school, the Principal.*

How can untimed syllabuses be implemented?

The notion of untimed syllabuses gives a false impression of what they should be, which is to offer flexibility for teachers to work with students.

One of our members has made the point that certain elements of mathematics are essential preparation for work in other subjects. This would need to be considered in any move to a more flexible curriculum.

Our preference is for core content that all students should have encountered by the end of the year, and that should be achievable in less than the full allotted time. Then in the remaining time, teachers need access to the resources to extend students and resources that support students who have additional learning requirements. Enrichment tasks or content/ topics should be from the year in which the student is and not from a year ahead.

If an ‘untimed’ syllabus is to be introduced, then teachers will need not only guidance about ‘how’ they should implement it but also professional development on ‘what’ is important at the progression points. This will mean that Government funding to all schools will need to increase significantly.

Do theory and practice need to be integrated in all subjects?

In school Mathematics, the practical applications of mathematics provide a large proportion of the motivation for students. At the same time many parts of mathematics are theoretical and abstract. In the history of mathematics there are many cases of mathematics being developed without an application in mind because mathematicians enjoy solving problems and describing patterns. Sometimes the applications of mathematics emerge a generation or

more after its initial invention. Good mathematics teachers are able to engage students in both aspects - the theoretical and the practical.

We need our curriculum to be informed by evidence-based research and focus on student learning in academic subjects, while strengthening vocational education. Most importantly, we need teachers who are skilled in the teaching of theory and practice in all subjects rather than out of field teachers teaching mathematics. Research conducted by AMSI in 2018, showed that 76% of students will be taught by an out-of-field teacher at least one year out of the first four years of high school. These years are fundamental to building fundamental knowledge, motivation and self-efficacy and teachers play a major role in these areas. Out-of-field teachers may have the mathematical skills, but do they really understand how to move students from recall and reproduction to integration and application of the knowledge?

A quote from a MANSW member

In my first years of teaching and then in my first years in Ext 2, (then 4U) I relied heavily on working from the syllabus, but it was difficult to judge the level of difficulty I needed to go to. We need a prescriptive syllabus from K - 12 which gives examples of the types of questions average and talented students should be capable of answering. I have seen too many teachers, mostly not specifically trained to teach Maths, rely wholly on text books, no matter what programs or help was available to them. Maybe NESAs should develop a detailed program, rather than a syllabus document, it would save all of us a lot of time that we could use to develop better teaching aids.

How does the NSW curriculum reform process relate to the national curriculum?

Here is a quote from one of our MANSW members:

I agree with most of the points raised here, in particular clarifying the relationship between the ACARA Australian curriculum and the NSW curriculum. The very least we should do is move from stages to years, and incorporate the Australian curriculum as the basis for this new curriculum (initially in years K - 10)

Would the recommendations of the Masters' Review really declutter the curriculum?

Possibly, but the NSW curriculum review timeline suggested by the Government is ridiculous. To expect that a curriculum for the 21st century, which should be globally competitive, be written inside the timeline proposed is preposterous. There needs to be more time spent looking at evidence-based research that lifts student learning rather than stifles it with too many content dot points that do not allow for deep learning to occur. Currently time is spent learning facts, formulae and rules instead of learning for understanding. This rewards students who have a good memory but does not cater for all learning styles and does not develop critical and creative thinkers.

From a MANSW member:

A lot of the curriculum needs to be overhauled, with sections reduced and omitted, but an essential thing to take place is the depoliticizing of education.

Do teachers need more or less flexibility in what they teach?

Teachers already make decisions for their students' learning needs. What they really require is a reduced 'core curriculum', which allows them to focus on what is deemed important with

opportunities to go beyond the 'core' for those students who need enrichment and support those students who require the additional support..

What is the appropriate division of responsibility between schools and parents?

From a MANSW member

Schools have taken on far too much of the emotional and social support of students. If, as a society, we want the whole child developed through schools, then schools need to be a broader element of the community comprising learning and the emotional, social, physical supports. Greater hours and far more professionals beyond educators.

Society is deferring many life experiences to schools. Only yesterday a school had students learning to change a tyre. While this might be important in life outside of school, this is something that a parent should be showing their child. What is disturbing is the number of parents and non-teachers who think that this sort of skill should be taught in schools.

Should post-modernism be taught in our schools?

The Hon Mark Latham MLC has made several sweeping statements about what happens in schools with little evidence to back them up. For example

2.52 NSW high schools have a massive problem: how to engage 13-16 year-old students (mostly boys) who have lost interest in academic subjects and start to dislike school. Their attendance rates drop and when they do turn up to class, they are disengaged and disruptive.

2.54 Instead of developing clear career pathways for non-academic students, some schools have allowed them to do what they want (mainly soft, time-filling courses like project-based art), believing any form of engagement is better than the classroom chaos they can create. This is producing a growing number of unemployable school 'graduates', with neither academic nor vocational prowess.

It is important to note that in many schools, there may only be a few students in each cohort that might take advantage of the sort of initiative that Hoxton Park has implemented. This type of initiative means that staff and timetabling would potentially affect other subject areas.

From a MANSW member:

As a teacher in general I am ALARMED by the content of this report. The author clearly has, in my experienced opinion, absolutely no idea what actually happens in schools. In fact, I would question if he actually understands what he was reporting about. He is quick to lay criticism at NESA but doesn't understand that this report is about education in this state - including Independent and Catholic schools. He keeps referring to Local schools Local decisions, but that is a DoE construct. He calls for the removal of welfare programs in schools - but has he actually been in a school recently. In my school this year I have had 1 attempt (at school), several referrals to higher authorities, interventions with external agencies, students in OOHC. Maybe he needs to actually spend some day[s in other schools]...The committee's report is vague and lacks conclusions. Worse, the Masters' Review is woefully lacking detail, practically or any sense of understanding.

What is the minimum acceptable standard and outcome for a NSW student after 13 years

of schooling?

To be literate, numerate, financially literate, statistically literate, have a deep knowledge of their history and most importantly, be critical thinkers so that they can analyse policies and critique the decisions made on their behalf by those in power.

In addition

MANSW would like to raise several other points. We agree with the Chair's suggestion at 2.157.

- Key reform goals: using an evidence-based approach to improve NSW school outcomes, de-clutter the curriculum and develop basic/foundational skills and deep knowledge among students. The emphasis must be on quality classroom teaching and school leadership expertise.

MANSW agrees that quality classroom teaching is fundamental to learning outcomes and improved results. However, we are concerned that the NSW Government is allowing the universities to accept students who want to become teachers, but who do not have the appropriate levels of education before commencing their degree. The expectation in most degrees is that a preservice primary teacher has at least a Band 4 in Standard Mathematics Yr12. In some cases, students have completed no mathematics beyond Year 10. While we believe that everyone can learn, many of these students are already behind, which means not only are they studying for their degree, but they are also attempting to bring their literacy and numeracy up to standard.

The introduction of the Literacy and Numeracy Test for Initial Teacher Education (LANTITE) has gone some way to identifying these students and addressing this issue. But LANTITE is a band aid solution as it is currently structured. In many cases preservice teachers are completing up to four and a half years of a degree where they also gained a significant HELP debt. Then having to sit and sometimes re-sit this test at a cost and delaying their exit from university. MANSW suggested several years ago that all prospective teachers should pass the LANTITE **before** commencing their initial teacher education programs. We believe that this is still the most effective way to ensure that we have excellent teachers of literacy and numeracy in all classrooms and especially in primary classrooms where the foundational skills in literacy and numeracy is learned.