Inquiry into the review of the New South Wales school curriculum
Submission from Science Teachers Assocation of NSW

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The Science Teachers Association NSW welcomes the opportunity to comment on the Inquiry into the review of the New South Wales school curriculum.

We acknowledge the NSW Government's leadership in undertaking this review in order to enhance the effectiveness of school education in NSW. A reform of this scale, proposed by Professor Masters is an ambitious plan that seeks to reorganise both the structure and content of the curriculum so that students are placed at the centre of decisions. The Review supports an entitlement of educational attainment at an individual level, The Science Teachers Association NSW believes this is commendable. The Review effectively responded to the community concerns and aspirations raised in the 2018 consultation, making recommendations based on current theories in pedagogy and policy reform.

2. The Science Teachers Association

The Science Teachers Association Inc (STA NSW) is an Incorporated Association representing Science Educators from across Government, Independent and Catholic School sectors throughout the state of NSW.

Our purpose is to achieve excellence in science learning and teaching, support professional standards and provide effective leadership for the profession of science educators.

We are governed by a Council of professional educators drawn from across NSW and all three education sectors and support 245 member schools and 266 individual members across the State.

Overview

Science Teachers Association NSW broadly supports the proposed reforms in 'Nurturing Wonder and Igniting Passion' and were very pleased to note the long-term nature recommended for this reform. The suggested ten-year timeframe is far more aligned to good policy implementation and inclined to achieve a positive result for education outcomes in NSW. We are disappointed that the Government has decided to truncate this timeframe into a four-year period. This raises significant concerns for the quality of the reform, teacher preparedness and the ability for the reform to address the issues that it was designed to do.

The scope of this reform required to deliver on the ambitious intent of the review will require significant cultural and organisational change to be managed within schools across NSW, the school systems, tertiary institutions and at NESA in order to affect the intent of individualised learning. To not consider this scope is a missed opportunity.

There were many unanswered questions about the practicalities of implementation and modelling of the reforms and the truncated time frame proposed by the Government will mean that the process for developing these will be less than ideal.

There is a missed opportunity to deliver a strong vision and new opportunities that schools would relish. The Government's response has watered down the reform and opportunities will be lost if appropriate time and deep thinking is not given to create an outstanding curriculum and school structure for NSW.

It was very pleasing to see Professor Masters consulted widely with teachers and leaders and used this consultation as part of the final review report. His work is to be acknowledged as finally giving expert practitioners a voice.

The extent to which the Masters Curriculum Review addresses its terms of reference, including:

(a) Curriculum content, flexibility and pedagogy

Curriculum Content

The Master's Review undertook two extensive consultations with the teaching community during the process of the review and has outlined effectively the need for reform.

The focus on decluttering the crowded curriculum is a bold one and an issue that was raised strongly during the initial consultation period. Addressing issues related to curriculum content requires substantial time and consultation to get it right. We recognise the debate regarding curriculum content in NSW has been ongoing over the years and it is essential that we use this reform process to ensure the issues are effectively and appropriately addressed. Any change to science content must not be rushed and the full term recommended in the Review is required to ensure we have a mapped overview of core content that will stand as a framework for this and future syllabus and curriculum changes.

Whilst out of scope of the review, a planned process to outline how this will be achieved would have been useful for both NESA and teachers in order to better understand the reform recommendations.

Flexibility

The Review effectively considered and made appropriate recommendations regarding addressing teacher flexibility issues. The Science Teachers Association NSW agrees with the concept of the reform direction for a more flexible curriculum (3.1) as this allows teachers and students to make decisions about learning that are appropriate to each school context. However, there are some questions about the practicalities of implementing this reform without the negative effect of adding an additional administrative and class management load onto the teachers.

In addition, we note there needs to be a balance between flexible curriculum options within schools and the consideration of foundational knowledge and skills for specific science courses at tertiary level.

It is our recommendation that some modelling be developed to supplement this reform proposal. We are not convinced that the proposed attainment level approach is a workable model given current resourcing and are concerned about the well-being of teachers who are likely to have an increased administration load.

Pedagogy

The review effectively considered issues related to pedagogy and collated responses from the consultation processes that dealt with issues of pedagogy, including drawing the link between how a curriculum supports effective pedagogy. However, changing the syllabus must be undertaken

with caution, recognition of current context and good planning. The Government's response to the Review Recommendations does little to address these concerns.

NSW implemented new stage 6 syllabuses in 2018/19, to consider a syllabus change, now within a four-year period would be inappropriate. Syllabus change requires teachers to undergo familiarisation and the additional work of reprogramming and planning. We recognise the alignment between the current Stage 6 Science Syllabus and the intent of the reform. We note that in a number of cases the Science Syllabus could be highlighted as a positive case study for example Science Extension and Depth Studies.

The Terms of Reference of the Review required Professor Masters to consider the implications of his recommendations for assessment, we believe all good teaching practice starts with the end in mind. Therefore, it is an imperative for decisions to be made about the assessment for content and skills prior to changing the curriculum and designing of syllabuses.

Commented [JP1]: Does this not then imply that we teach to a test? Is that what we want to be saying?

Commented [MS2R1]: No we are not teaching to the test. We need to know is our evidence of learning an exam, a portfolio of student work, school based tasks or ..... Not what is in the exam.

Insufficient consideration was given to the relationship between assessment and pedagogy in the Review. Whilst there was significant comment on refining the number of HSC subjects, there was little reflection on the removal of the HSC exam. Whilst the exam remains in place, there will always be a tendency to prepare students for the exams and no syllabus design will change that.

Professor Masters rightly reflected the concerns about the ATAR and the impact it was having on teaching and learning in schools, "including concerns about its distorting influence on students' subject choices, its creation of hierarchies of school subjects, its overshadowing of HSC results, and its impact on the perceived value of post-school pathways other than university entry"

The pedagogy of using investigative projects to deepen knowledge and support the application of skills has been in practice since the 2001 syllabus. In Science stage 4 – 6 Science subjects we have major mandatory investigative projects. From experience we recognise the need for professional development to support new teachers with managing the practice of these projects. The Science Teachers Association NSW run significant volunteer led programs every year for teachers to improve their student learning in this area.

(c) Recommendations for student-centred 'progression points' and 'differentiated learning' in schools and whether such initiatives are research-based and proven to be effective

The argument for differentiated learning is sound and supported extensively in literature to address the learning needs of students. Professor Masters has responded appropriately in addressing at a conceptual level progression points and differentiated learning in the review.

The challenge with differentiated learning however comes with the implementation. The review fell short of thinking through the implications of introducing these concepts to the classroom. In practical terms, to introduce a common entitlement in science curriculum, it would need to be accompanied by a greater level of differentiation. In doing so, this raises the question of what resources are needed to support teachers in creating and implementing individualised plans for students; working in a classroom that is highly differentiated; and how to allocate resources to enable access for all students. Support for teachers is required in the form of professional learning and a reduction of face to face teaching in order to implement this reform.

(d) Relationship with the national schools' curriculum

Professor Masters recognised the national policy environment as it related to the Australian Curriculum and considered his recommendation in recognition of this policy environment.

Consistent with the Australian Curriculum Professor Masters included general capabilities and identified some of the difficulties in teaching these general skills.

Professor Masters drew a direct link between NSW syllabuses and the Australia Curriculum, however, it was weakened by the term 'if possible'. The overcrowding issue can be solved if the content of the AC is used in the NSW syllabuses without additional content added.

The F-6 Science curriculum of the Australian Curriculululum is not implemented in NSW because of the legislated requirement to teach Science and Technology together in NSW. This limits the resources that teachers can draw from to support teaching and learning and has resulted in a crowded curriculum.

2. The extent to which the Masters Review meets key Government policy objectives, including:

(a) Addressing concerns about the overcrowding of the curriculum

The Review recommendations seek to reduce content and support syllabus reform that will focus on core concepts, principles and methods for each subject. In doing so Professor Masters effectively addresses the concerns of overcrowding.

We strongly support the Reviews intent to create a less crowded curriculum. We recognise the widespread concern regarding the current curriculum being complex and overcrowded and concur with the need to review syllabuses. This would need to be balanced against providing a strong foundational knowledge in Science to support students who wish to pursue tertiary studies in the sciences. The overcrowding of the K-6 Science and Technology is regularly raised as an area of concern to educators and a reduction of content of that syllabus would be regarded as an immediate priority.

In considering what content ought to be required for science, we agreed that syllabus content needs to be meaningful and linked to everyday life with a focus on core scientific concepts. Unfortunately, while the HSC exams still exist in the current format, greater clarity about mandatory content is essential for teachers. However, if this external exam were to be changed, it would give teachers more flexibility to provide rich learning environments through a flexible curriculum.

(b) Ensuring students' acquisition of excellence in literacy and numeracy, as well as deep knowledge of key subjects

The Review addressed the needs to improve literacy and numeracy, effectively taking into consideration the individual needs and contexts of our student population. The recommendation

regarding the decluttering of the curriculum and the individualised learning, provides teachers with the flexibility to take the time to ensure deep learning.

What the review failed to do was to explore the links between literacy and numeracy being taught in context of other subjects such as science. As ACARA have done here for numeracy https://www.australiancurriculum.edu.au/media/3668/numeracy-science.pdf and here for Literacy https://australiancurriculum.edu.au/media/3657/literacy-science.pdf in relation to science.

(c) Professor Masters' explanation for NSW declining school results and the role a revised curriculum can play in reversing this decline

Professor Masters explanation accounts for a component of the decline in school results consistent with the terms of reference of the Review. What was out of scope for the Review, that has significant impact on school results is the socio-economic environment of the school community. A student living in poverty or experiencing domestic violence is unlikely to be performing well in a PISA test.

A greater intersection between our education systems and programs such as Their Futures Matters being delivered by the Department of Communities and Justice might offer opportunities to support school results. Further we challenge the notion of using PISA as a benchmark to be measuring our students performance against because the extent of variability in schooling, syllabuses and the life circumstances of students from different countries will impact on the comparison of results of an international common assessment

Other matters of public concern and interest in the development of the NSW curriculum:

(a) To what extent, if any, 'cross-curriculum priorities' are needed to guide classroom content and teaching

The consultation process for the review provided effective opportunity for the sector to provide commentary on cross curriculum priorities.

Our position on this issue submitted to the review and addressed in the final report is as follows

Science Teachers Association NSW recognises the current cross-curriculum commitment to ensure the unique place and diversity of Aboriginal and Torres Strait Islander people, their connection to Country land and waters. We believe that this must be included as a Common Entitlement in order to support deep learning of First Nations histories, science and cultures and support true ongoing reconciliation. Within Science there are many opportunities to embed both historical and current scientific knowledge of First Australians.

STANSW welcomes a curriculum that fully integrates knowledge, skills and capabilities. Currently the layering of the capabilities into the NSW syllabus documents is not offering full integration. Science teachers are already working towards an effective integration of knowledge and skills.

(b) To what extent, if any, knowledge and the curriculum are 'socially constructed', requiring the teaching of source verification and fluidity principles

The key features in the final report include appropriate scope to address issues related to source verification specifically:

- Learns with Understanding - depth of learning in core concepts, principles and methods
- Builds Skills in Applying Knowledge – conceptual and critical thinking skills to apply knowledge
- Makes Excellent Ongoing Progress – students are given the time and support to understand before being moved on.

With respect to science, students are taught to question sources and the need for this to continue is easily demonstrated in the current climate of conspiracy theorists. This must remain a working scientifically skill for all students so they learn to reflect on the currency, authority and expertise of the person making the claims. Science knowledge is dynamic and changing, so the ability to understand, not only the current scientific thinking but also be able to construct new ideas based on future research is an imperative in education. Science thinking is based on socially constructed philosophies and have witnessed many paradigm shifts over the centuries. It will continue to do so into the future so our students need to be able to understand that knowledge is not a static thing that you learn but is based on facts that are dependent on the technology of the day.

(c) Whether and to what extent schools should be involved in the 'social and emotional development' of students, as per the Melbourne/Alice Springs Declarations, and growing popularity of 'wellbeing programs' in NSW schools

The Review appropriately places in context the social and emotional wellbeing of students that underpins their capacity to learn, it also notes the community aspirations of supporting the social and emotional development of students.

Professor Masters rightly identifies the link between emotional engagement with learning and the capacity to learn.

The Review does not prescribe how this ought to take place, other than to note the requirement of it as a Core Design Principle. How this bears out in the reform process must keep in mind the imperative to de-clutter the curriculum

(d) Adequacy of the content and depth of teaching of Australian history, pre- and post-1788

Both of Professor Masters consultations included input from those teaching in the discipline of History. As this is outside the scope of Science Education we will defer to the History Teachers Association on this issue.

(e) Given the importance of English literacy across the curriculum, adopting the most effective evidence-based approaches to language acquisition, especially for reading and writing

Professor Masters appropriately highlighted English literacy in the Review, noting it as a priority during the early years alongside numeracy in his recommendations. The approach for language acquisition was not addressed in the final review, it is assumed that the Government will ensure

effective processes during implementation to adopt the most effective evidence-based approaches to language acquisition.

(f) Role and effectiveness of vocational education syllabuses in NSW schools

The proposal to integrate vocational applications is generally supported, although STANSW would not support any move away from providing appropriate foundational knowledge and skills that prepare more able students for tertiary study. Some of the data used in this reform is perhaps out of date since the COVID-19 pandemic and so more time is required to revisit this research.

(g) Effectiveness of NESA in curriculum development and supervision

For many years there has been an ineffective timeline mandated for NESA in the development of new curricula. This is happening again. Professor Masters reform suggests 10 years which would give NESA adequate time to plan and implement a sound reform however, the Government's response has truncated this timeframe to four-years. NESA requires greater financial support and more autonomy so that the NESA Education Experts have sufficient time to develop the right programs for educators.

Other comments.

The Review recommendations proposed by Professor Masters is appropriately ambitious. It suggests a long-term vision and stability for our education system. Education Reform must sit above party politics and be informed by evidenced based policy. To be effective significantly more planning and adequate and transparent economic modelling and the commitment of appropriate budgets are required to ensure the success of this reform process.

The Government timeline for these reforms is not sufficient to allow appropriate processes, adequate preparation and development of syllabuses.