Submission No 12

INQUIRY INTO REVIEW OF THE NEW SOUTH WALES SCHOOL CURRICULUM

Name: Mr Greg Ashman

Date Received: 17 July 2020

Inquiry into the New South Wales School Curriculum

Greg Ashman

Note that I have supplied direct links to sources via hyperlinks in this document.

Introduction

I am Head of Mathematics and Head of Research at Ballarat Clarendon College, an Independent School in Victoria where I also teach mathematics and physics. I write a blog about education at gregashman.wordpress.com and I host an education podcast at gregashman.podbean.com. I am currently completing a PhD in Instructional Design at UNSW and I have written a book, *The Truth About Teaching: An evidence-informed guide for new teachers* and have another book due out in February 2021, *The Power of Explicit Teaching and Direct Instruction*.

I wish to comment on two topics raised by the terms of reference of the committee – individualised or differentiated instruction and the nature and content of the school curriculum.

Individualised or differentiated instruction

It is a trivial observation that in any class of 20-30 students, there will be a variation in the level of preparedness of students to tackle new content. Some of this is created by schools e.g. by not properly teaching a proportion of students to read. However, even if we were to iron out these school effects, there would still be natural variation due to environmental and other factors, such as individual working memory capacity.

The popular solution to this problem is to exhort teachers to 'differentiate' i.e. modify the lesson in some way for different students or groups of students. To an extent, pretty much all teachers do this. They may circulate the room offering additional help to some individuals, they may re-explain concepts to some students or they may assign extension work to students who are more advanced. They may also, for example, make use of assistive devices to help hearing impaired students – an example of a 'reasonable adjustment' for students with a disability. However, educationalists tend to have something grander in mind when they talk about differentiation.

One model that is extremely popular with Australian education academics is Universal Design for Learning or UDL. UDL proposes a number of principles on which we could vary lesson content to suit different students. The idea is to provide equal access to the curriculum for all. The UDL website presents a range of guidelines such as 'optimize individual choice and autonomy' and 'offer ways of customising the display of information'.

However, despite its popularity, there is little evidence of the educational effectiveness of UDL. A 2017 review of the available evidence concluded, "The impact on educational outcomes has not been demonstrated." In fact, it is not entirely clear that some of the suggestions align with research. For instance, there is evidence that, given the option, students tend to choose ways of learning that are the least effective for them.

The failure to find a positive effect for UDL is perhaps not surprising in the international context. We have to be extremely careful when comparing countries on measures such as the Programme for International Student Assessment (PISA) because we are often not comparing like with like. Different countries and states vary on a vast range of factors, including economic activity and demographics, attributes that are likely to affect educational outcomes. And there are additional factors relevant to education. For instance, the relationship in Finnish between letters and the spoken sounds they represent is far more straightforward than in English – researchers say that Finnish has a 'transparent orthography'. Given the facilitating role of literacy in all academic learning, we should expect this to

be important. Nevertheless, if we set these concerns aside and look at those countries that are traditionally considered to be doing well on PISA measures, differentiation does not arise as a major theme.

For instance, my own crude research actually shows a *negative* relationship between differentiation and a country's performance on PISA maths. As part of the PISA process, teachers are asked a variety of survey questions, one of which is how often they, "give different work to the students who have difficulties learning and/or those who can advance faster". The greater the proportion of teachers in a country who answer 'frequently' or 'in almost all lessons', the worse the PISA maths performance. This is clearly not definitive. It could be the case that a greater use of differentiation causes worse performance, but it could just as well be true that poor performance causes teachers to use more differentiation as a mitigation strategy. Or there may be some other factor at play. Regardless, there is no strong signal that differentiation is a practice associated with the best performing countries.

Why might this be the case, given the fairly obvious logic that tailoring teaching to meet the needs of individual students should be better than a one-size-fits-all approach? A clue may be found in a research project conducted in the United States. Carol Ann Tomlinson is probably the world's best-known proponent of differentiated instruction and she was part of a team of researchers who developed and implemented a staff development program on differentiation in six schools across three states, with three additional schools acting as a control. Unusually for an education research program, the intervention did not generate positive effects. One suggested reason was that it was not implemented properly by teachers.

When considering differentiation, we need to consider the fact that there is a trade-off between the advantages of more targeted teaching and the practical realities of delivering it. Imagine, for instance, a teacher splits a class into five groups which work on five different activities tailored to their perceived needs. In a 60 minute lesson, this would allow a maximum of 12 minutes of direct teacher input with each group and that obviously excludes any time used for marking the roll, general class organisation, organising the groups and redirecting groups that are not currently under direct teacher supervision. Research strongly suggests the efficacy of direct teacher instruction and yet, in one stroke, we have reduced the potential for such instruction from 1 hour to 12 minutes.

So, either differentiation does not work in theory or it does not work in practice. Either way, it seems like a poor bet. Yet it gets worse.

How do we know that the work we select for different students is pitched at the appropriate level? We would need extremely robust assessment instruments that ensured that teacher biases did not end up limiting the potential of students by giving them low-level content.

And differentiation can mean completely opposite things. Imagine, for instance, a child who experiences extreme difficulty with writing. One approach in the English classroom may be to allow them to record a video or podcast instead of writing an essay. A different approach may be to give the child intensive writing support. In other words, we may either accommodate or address the underlying issue. Either approach may be appropriate at different times or in different contexts. However, both could be described as 'differentiation' even though they represent opposites of each other. It is therefore very difficult to understand exactly what anyone means by the term.

The proposals of the NSW curriculum review, like those of the "Gonski 2.0" review before it, go much further than current models of differentiation in suggesting each child should be on a separate learning pathway. Rather than have students in a class work on different versions of the same content, the radical idea seems to be to allow students in the same class to be working on entirely different content. A recent example of attempting fully personalised learning of this kind involves schools in the U.S. that have taken the rather dystopian approach of sitting students in front of banks of computer screens all day, with each computer supposedly delivering personalised content. These schools have met with little success so far.

In short, I cannot see how a proposal for individual learning pathways could be made to work and I do not see any research evidence to support such a proposal.

The content of the school curriculum

A consistent narrative of all curriculum reviews is that the content needs to be 'decluttered'. This has become a mantra, along with the notion of going 'back to basics', and so it is easy to imagine pundits mouthing these words without ever considering what they actually mean. So, let's consider precisely that.

At first viewing, the Australian Curriculum, on which all state curriculums are meant to be based, does not appear to be brimming over with knowledge. Examine, for instance, the science curriculum. One third of this is what we might traditionally call 'science'. Another third is about the methods scientists use for testing their ideas – the scientific method. This has some value and students should learn about it, but should it really occupy a third of the curriculum focus? The final third is waffly stuff on, 'Science as a human endeavour' which includes such platitudinous truisms as, "Scientific knowledge has changed peoples' understanding of the world" and that seems to have been inserted in a misguided attempt to make science more like the humanities.

We could 'declutter' the science curriculum by getting rid of the vacuous and meaningless stuff, but I would then want to re-clutter it with rich scientific knowledge. However, I fear that those who want to 'declutter' want to cut the amount of scientific knowledge that is present now and leave all the vacuous stuff intact.

In addition to actual subjects, the Australian Curriculum has a number of 'general capabilities' that are intended to cut across subject areas. These include literacy, numeracy and 'critical and creative thinking' among other constructs. Why do we need a subject of English *and* a general capability of literacy? Why do we need a subject of mathematics *and* a general capability of numeracy? It's not clear.

However, perhaps the most egregious example is critical and creative thinking. These are simply not *general* capabilities, as professor of cognitive psychology, Dan Willingham cogently argues in a publication for the NSW Centre for Education Statistics and Evaluation. If you want to think critically about science, you need to know a lot of science and if you want to think critically about history, you need to know a lot of history. In a previous paper, Willingham has argued that trained scientists can fail to think critically about things they know little about whereas small children can demonstrate critical thinking about areas they are familiar with.

A more technical version of this argument may be found in a paper by Emeritus Professor John Sweller of UNSW and Dr. Andre Tricot. They point out that, to the extent to which abilities such as problem solving *are* general, we have evolved to acquire these abilities as a normal part of development and therefore do not need to be taught them. The purpose of schools is to teach the bits we have not evolved to acquire naturally i.e. subject specific knowledge.

This leads to two conclusions. Firstly, it is pointless to parachute critical and creative thinking in as a general capability. Secondly, knowledge is absolutely vital to critical thinking. If we want to develop the problem-solvers, creatives and critical thinkers of the future, then we first need a knowledge-rich curriculum. Yes, there are methods within each subject area that we can deploy to encourage these capacities, but these methods – such as the argumentative essay – have traditionally been part of these subjects anyway.

So, if by decluttering, we mean stripping away fluff, returning to well-defined subjects and ensuring a rich well of knowledge within each subject, then this would be a good thing. If we mean further

degrading the already degraded knowledge component of the curriculum, then we will only make matters worse.