The Wilkie Way
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www.wilkieway.co.nz

Politics and Education

Politics in education work on the philosophies of the people the politicians listen too. Politicians rarely have a deep understanding of education, the teaching and learning cycle, how different students learn and how different teachers deliver their craft. The idea that there is a one best way of teaching maths (likewise for the teaching of reading) is ludicrous and shows a total lack of understanding of teaching and learning.

Let's look at what history can teach us.

1788 PIke wrote a text on the best way to teach mathematics based on the philosophy of the teaching process based on state a rule, give an example then complete practice exercises sufficient to develop the use of mathematics required to solve unfamiliar and yet to be invented problems.

Many people today could say they were at the receiving end of this philosophy - if the goal of the mathematics assessed is to get correct answers then all the student requires is an instructional understanding, recall of facts and apply set procedures to familiar problems in everyday life.

Many people would agree this is all that is required for people to be able to manage their budgets and deal with everyday operational tasks requiring straight forward application of numbers in familiar contexts.

Politicians would see students making progress as they get more answers correct on tests. They learn facts by rote and can recall them at speed. (another erroneous measure of success used by many people.)

However there is no real understanding and not understanding is one of the most frustrating and ultimately defeating experiences. This may lead to people seeing themselves as no good at maths and the rise of the myth that you are born with or without a maths brain.

Just 30 years later in 1821 Colburn wrote a text based on the philosophy that students need to build an understanding of mathematical concepts, to explore why processes or formulas work, to connect pieces of knowledge together. Teaching that focuses on students understanding both of what to do and why, results in transferable mathematics knowledge. As the new knowledge is connected to knowledge students already know the new learning is easier to remember. This type of understanding is one of the most intellectually satisfying experiences. However it develops over time and becomes more complex as more connections between ideas are made.

I think we can all agree that there is more to mathematics than just getting a correct answer but is there some merit in the writings of Pike. Did the baby get thrown out with the bathwater? The fact that many of our students cannot reliably add and subtract when they reach intermediate is a problem. They are struggling with a basic procedure that should not be taking up "brain space".

For example: The place value system is a man made system that follows certain rules. Is there still a place for stating the rule, giving an example and completing practice exercises?

Coburn's philosophy was based on the need for people to think critically, creatively, strategically and logically. His writing was written at a time when the world was poised at what is now called the industrial revolution. The pace of change has only continued to increase at an ever increasing speed.

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Students need both the ability to apply procedures reliably and efficiently. However their knowledge also needs to be transferable so they require some understanding.

Many adults have said they didn't understand at school but when they required the mathematics in their chosen field of work, the context they were working in provided an understanding and made sense of the mathematics. They go further and say if they did not have the knowledge from school then they would have had no foundation to start from.

So how do we avoid students seeing themselves as no good at maths resulting in maths anxieties (which are a real barrier to mathematics learning).

We need an approach that is as varied as required by each individual's learning style. Some students love taking risks and jumping in and giving problems a go without worrying if they make mistakes. However, in my experience this is less likely to happen unless the students have a base grounding in mathematical knowledge and a learning culture that is dependent on a teacher who is very secure in their own knowledge of the mathematics and is quite happy to allow students to make mistakes and knows how to guide them back to the intended learning.

Other students are not risk takers and prefer to have a wide body of knowledge and be guided though problem solving with gradually moving from familiar to unfamiliar problems with the teacher guiding the formation of connections between a sequenced development of conceptual ideas.

The one aspect both sides of the pendulum agree on is the need for practice but practice requires intrinsic motivation and the desire to improve. If improvement is measured in a high stakes environment (eg national testing) what students learn is not learning occuring then being measured, it is learning being changed for the measurment and by the measurement.

The intended real understanding (which takes time) is changed to instructional understanding to meet the measure and the illusion of improving data satisfies the politicians agenda.

To really develop a conceptual understanding we need to look at what in the classroom actually makes the difference. It is not the physical resources - textbooks, worksheets, google slides or digital learning platforms but the role of the teacher.
I was assured by a previous Minister of Education that teachers leaving training college will have everything they will ever need to know to teach mathematics. Who told the minister that this was true? Anecdotally, teachers new to the classroom are less likely than ever before to have everything they need to teach mathematics. Having secondary qualifications in maths does not necessarily mean they have the conceptual understanding of the mathematics required to enable them to assist students to make connections that they themselves may not yet have made. This is especially true for the primary levels of mathematics (phase 1 and 2). Connecting the ideas is how concepts deepen and expand and become more complex. If foundational understanding is missing further development is impossible.

There is no quick fix to developing teacher conceptual understanding. Schools in countries that achieve highly, value their teachers as learners and professional learning is built into their working week. In New Zealand, teacher professional learning is contestable on the needs of the school - most often measured by student data. You may be lucky and be in a school that decides mathematics professional learning is something the school would benefit from then all teachers receive professional development.
A good facilitator will tailor the learning to the individual teacher as each teacher has their own starting point. Some teachers are self motivated, have a love of mathematics and seek out opportunities for self directed learning. Many teachers may want to be a better maths teacher but it is not a priority among all the other things they can be learning about. Self directed learning does not happen for mathematics. Some teachers will avoid maths learning due to their own maths anxieties.

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Many teachers I meet have been teaching for over 10 years and have never had the opportunity for any supported mathematics professional learning.

Jan Tinetti's announcement that the common practice model would ensure all teachers had the same understanding of how to teach the essential skills is a step in the right direction. But delivering a paper document (or available on line) will not make the difference in the classroom without professional learning support available to all teachers.
Putting things up on a website for self directed in school learning will result in patchy results and we will make no change to the fact that topics are taught differently between schools and often differently between classrooms. The resulting standard of learning a student receives is still dependent on the quality of the teacher in the classroom.

The pedagogical practices outlined in phase 1 of the common practice model (Not to be confused with phase 1 of the curriculum) are all sound pedagogies and every teacher should employ all of the pedagogies in their maths programme. However changing or even just improving a teacher's practice does not come from reading a piece of paper. It comes from seeing the results of the different practices in the learning of the students. This doesn't mean the results of tests but in seeing the whole teaching and learning cycle as it unfolds in the classroom. Providing videos of it happening in someone elses classroom is not as powerful as seeing it modeled in your own classroom with your students by a skilled practitioner and then supported over a period of time to make the changes to your own practice.

Phase 2 (of the common practice model which we are still awaiting), I understand will give us more guidance on the progressions year by year. Will it give teachers a conceptual understanding of the mathematics and the connections and relationships between the progressions? At worst it could become a tick list of items taught but not necessarily understood.

It would be wonderful if every school had an onsite skilled practitioner who could focus on the teacher learning instead of the lead teacher of mathematics being a classroom teacher with full class responsibility and the title lead teacher of mathematics with maybe a unit with a little extra pay but no time to actually work with other teachers.Only a handful of schools even have a lead teacher of mathematics - one school told me they didn't need one as there was no budget for maths.

An effective lead teacher of mathematics must have a deep conceptual knowledge of mathematics from the earliest progressions through to at least end of phase 3. This teacher must be a strong classroom practitioner who can demonstrate all of the different pedagogies as outlined in the common practice model. On top of this the teacher must also understand the adult learner and must be skilled in facilitating learning by building trusting professional relationships and be able to give and receive feedback.

Wouldn't a curriculum lead teacher role be an amazing career option for teachers instead of the only option at present. To remove oneself from the classroom and therefore the curriculum and end up focusing on property and the other myriad of tasks falling under the umbrella of the principal.

Noticeably in New Zealand the head of the school is not referred to as a head teacher.

In my opinion, our education system, lead by the Ministry of Education, does not appear to value the highly effective classroom practitioner. I would therefore ask, why would you strive to become one? Surely these are the very people we need to be mentors to trainee teachers. (Universities say it is the responsibility of the school to build the practical aspects of teaching - they only do theory.) We need them to support beginning teachers in their formative years. We need them to support the ongoing professional learning of all teachers.

If we are serious about improving educational standards then invest time and money into the resource that makes the biggest difference - the teachers.

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New Resources for Wilkie Way Members

Subscriptions purchased at the online store at www.wilkieway.co.nz

Individual $55 - paid via paypal

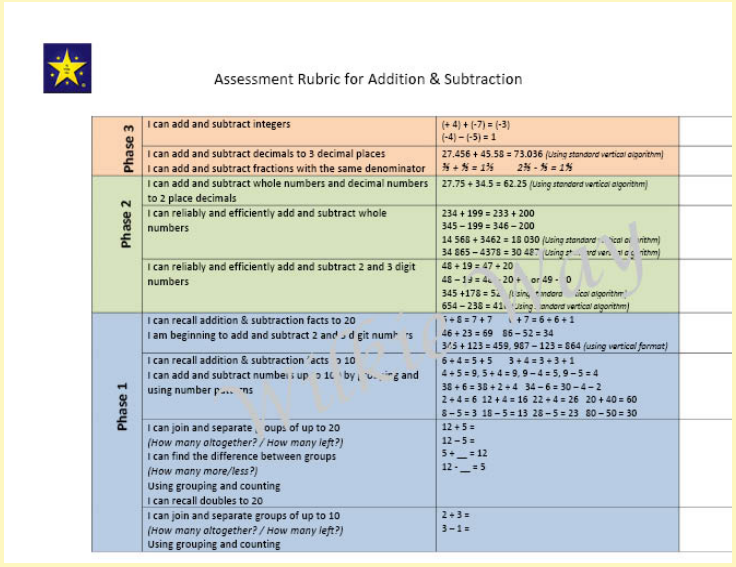
NZ School paid via invoice - complete form at online store

Under 30 Students $60 + GST 30 to 100 students $160+GST

101 - 300 students $260 + GST 301- 500 students $360 +GST

501 - 700 Students $460 + GST 701+ Students $560 + GST

Non NZ School $660 - paid via paypal



Assessment Rubric for Addition & Subtraction

Phase 3	I can add and subtract integers	(+ 4) + (-7) = (-3) (-4) – (-5) = 1
	I can add and subtract decimals to 3 decimal places I can add and subtract fractions with the same denominator	27.456 + 45.58 = 73.036 *(Using standard vertical algorithm)* ⅗ + ⅘ = 1⅕ 2⅗ - ⅘ = 1⅘
Phase 2	I can add and subtract whole numbers and decimal numbers to 2 place decimals	27.75 + 34.5 = 62.25 *(Using standard vertical algorithm)*
	I can reliably and efficiently add and subtract whole numbers	234 + 199 = 233 + 200 345 – 199 = 346 – 200 14 568 + 3462 = 18 030 *(Using standard [illegible] algorithm)* 34 865 – 4378 = 30 487 *(Using st[illegible]rd vertical algorithm)*
	I can reliably and efficiently add and subtract 2 and 3 digit numbers	48 + 19 = 47 + 20 48 – 19 = 4[illegible] 20 + [illegible] or 49 - 0 345 +178 = 5[illegible] *(Using standard [illegible]tical algorithm)* 654 – 238 = 41[illegible] *(Using [illegible]andard vertical algorithm)*
Phase 1	I can recall addition & subtraction facts to 20 I am beginning to add and subtract 2 and [illegible] digit numbers	[illegible] + 8 = 7 + 7 [illegible] + 7 = 6 + 6 + 1 46 + 23 = 69 86 – 52 = 34 [illegible]3 + 123 = 459, 987 – 123 = 864 *(using vertical format)*
	I can recall addition & subtraction facts to 10 I can add and subtract numbers up to 10 by [illegible]ing and using number p[illegible]rns	6 + 4 = 5 + 5 3 + 4 = 3 + 3 + 1 4 + 5 = 9, 5 + 4 = 9, 9 – 4 = 5, 9 – 5 = 4 38 + 6 = 38 + 2 + 4 34 – 6 = 30 – 4 – 2 2 + 4 = 6 12 + 4 = 16 22 + 4 = 26 20 + 40 = 60 8 – 5 = 3 18 – 5 = 13 28 – 5 = 23 80 – 50 = 30
	I can join and separate [illegible]oups of up to 20 *(How many altogether? / How many left?)* I can find the difference between groups *(How many more/less?)* Using grouping and counting I can recall doubles to 20	12 + 5 = 12 – 5 = 5 + __ = 12 12 - __ = 5
	I can join and separate groups of up to 10 *(How many altogether? / How many left?)* Using grouping and counting	2 + 3 = 3 – 1 =

Assessment:

Assessment rubrics for

- Addition/Subtraction
- Multiplication/Division
- Place Value

Take out a membership in term 4 (individual or school) and your annual membership extends to February 2025

Order your Wilkie Way Assessment Screens for delivery Term 1 2024

Use the pre-order form available at https://www.wilkieway.co.nz/blog/ before the end of term 4 to receive the 15% discount.

The Wilkie Way Teacher Challenge

Shopping in the USA

If you bought one of the item you would use 4 coins.
If you bought 2 of the item you would use 6 coins
If you bought 3 of the item you only need 2 coins.

The item costs less than one dollar. How much does the item cost?

Important knowledge for this problem:

US coins 1 cent (a penny) 5 cents (a nickel) 10 cents (a dime)

25 cents (a quarter) 50 cents (half dollar)

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