researchED

Issue 2
September 2018

EVIDENCE-INFORMED EDUCATION – MYTH BUSTING – BUILDING A COMMUNITY

DAISY, DAISY: CHRISTODOULOU, THE QUEEN OF ASSESSMENT, ON UBERMYTHS

Sam Freedman – how to make better education policy

Bringing researchED to New Zealand

Nick Rose – classroom psychology

Efrat Furst – What can we learn from neuroscience?

What's on our bookshelf?

INSTITUTE FOR TEACHING
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The **Institute for Teaching** is a specialist graduate school for teachers. Our courses have a single purpose – to help teachers to keep getting better.

We're dedicated to developing evidence-based practice, and our faculty are always exploring the best education research and thinking. Here's what they've been reading recently:

Harry Fletcher-Wood, Associate Dean, Fellowship in Teacher Education

The Power of Moments – *Chip and Dan Heath*
This book clearly summarises the evidence on how to make experiences feel powerful, memorable and worthwhile – these are all aims for our Fellows programme.

Applying Cognitive Science in Education – *Frederick Reif*
We've found Applying Cognitive Science in Education very helpful when thinking about how to make our curriculum logical and meaningful.

Peps Mccrea, Associate Dean, Masters in Expert Teaching

The Unified Learning Model – *Shell et al*
This model bravely attempts to unite cognitive and motivational sciences in a framework we can use to design for, and facilitate learning.

Peak: Secrets from the New Science of Expertise – *Anders Ericsson and Robert Pool*
Peak is a grand tour of Ericsson's decade-long research into expertise across performance professions – definitely worth a read!

Katy Patten, Associate Dean, Transforming Teaching

Secondary Curriculum and Assessment Design – *Summer Turner*
This is a helpful guide for leaders improving curriculum design in their schools – we're drawing on it in year 2 of our Transforming Teaching Programme.

Creating the Schools Our Children Need: Why What We're Doing Now Won't Help Much (And What We Can Do Instead) – *Dylan Wiliam*
There's no simple and universal blueprint to create great schools but this book explores what research tells us about how we can improve our chance of success – from curriculum choices to teacher PD, as well as how we can evaluate new initiatives.

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MESSAGE FROM THE EDITOR

The relationship between education policy and education evidence has never been easy. The realpolitik of education is pulled hither and thither by many horses, and research bases are only one of several influences. In 2010 the CfBT report *Instinct or Reason: How education policy is made* asked every surviving post-war UK minister what the principal reasons behind their policy decisions in education were. The answers were sobering, if unsurprising:

- Urgency – a sense that 'something must be done'
- Ideology – the values and beliefs of policymakers
- International exemplars
- Cost
- Electoral popularity
- Pressure groups
- Personal experience
- Research evidence

Notice research there; a dusty bottom.

There are many reasons why this is perfectly understandable, of course. Parties are elected to deliver a manifesto, which is composed to reflect the values and ideologies they seek to represent. Evidence that confounds or contradicts these platforms can be seen as an obstacle rather than an ally to the policy process.

But there is cause for hope. The growing and international appetite for evidence-informed education we see at **researchED** events and beyond is fuelling a renewed appetite for evidence-informed policy to drive that agenda.

Change in policy can be slow; ministerial churn can be fast. In this issue, I speak to Nick Gibb, the UK Schools Minister, a politician who, probably more than most in the UK, has spearheaded a drive towards evidence-informed education, particularly in the field of phonics and literacy, but also more broadly in pedagogy. This interest at a ministerial level in the affairs of what happens in the classroom has not been met with open arms, and Gibb has attracted criticism for walking into what was once described as the 'secret garden' of education.

It is easy for politicians and policy-makers to look to education for the engine of their reform programmes. The Jesuit philosophy of catching them young is attractive; you have a reasonably compliant cohort of tomorrow's scientists and sailors who crucially, can't yet vote. Society-building and vocational imperatives are also big drivers in policy behaviour. But where does the ambitious politico turn for expertise and answers? Why, the experts. But which ones? In a field as contested as education, it is understandable if politicians recruit advisors who flatter rather than inform.

Which is why evidence-informed education has never been needed more. Education strategies must be as evidence-informed as possible, from the classroom to the Oval Office. It is entirely right that democracies should define the goals of education; it is imperative that once that will has been conceived, evidence should be the backbone of how we seek to realise it.

Which is why at **researchED** we engage with everyone involved in the education ecosystem, from teaching assistants to cabinet ministers, with the ambition that informed and careful conversations will save us from the dogma and superstition that has characterised our extraordinary and turbulent profession. I hope you enjoy our second issue of **researchED** magazine, and find something to challenge, inspire and enthuse you in your practice.

Thanks for reading.

Tom

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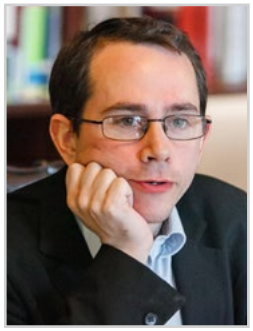

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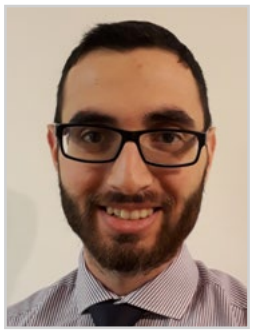

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GIVE ME YOUR ANSWER DO

AN INTERVIEW WITH... DAISY CHRISTODOULOU

Education's fastest talker tells us about mythbusting, why assessment drives everything else, and the seven myths of edutech

Daisy Christodoulou is the author of *Seven Myths about Education* and *Making Good Progress?: The Future of Assessment for Learning*, as well as the influential blog, *The Wing to Heaven*. She is currently the Director of Education at No More Marking, a provider of online comparative judgement. She works closely with schools on developing new approaches to assessment. Before that she was Head of Assessment at Ark Schools, a network of 35 academy schools. She has taught English in two London comprehensives and has been part of UK government commissions on the future of teacher training and assessment.

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What's your background?

I did Teach First, trained as an English teacher, in a school in London for three years, then another secondary school. I was working in a school that went into special measures. It was challenging. And I learned that a large amount of advice out there for us – or what was being mandated for teachers – didn't reflect reality.

Like what?

We were getting a lot of Ofsted scrutiny. I write about this in *Seven Myths*. The kind of information we were getting about how you succeed for Ofsted, and lots of the advice wasn't based in reality and it didn't have any evidence backing it up.

For example?

The biggest thing I came back to in *Seven Myths* was an example of a best practice lesson for an English teacher about *Romeo and Juliet*: teaching students by getting them to make puppets. These aren't straw men. One criticism *Seven Myths* gets is that this is a 'straw man'. But it's all based on Ofsted reports from that era. If only I'd made this up, if only this had been a figment of my imagination and not best practice. The problem with that – and it's not just a knee-jerk reaction, 'all puppets are stupid' – is that when you look at the evidence, you remember what you think about. And what you think about is how you made the puppets. You won't be thinking about *Romeo and Juliet*, you'll be thinking about puppet mechanics. It's not that I'm averse to making puppets. If that's your aim, great. But as an English teacher, learning about *Romeo and Juliet*, that advice to make puppets wasn't very helpful.

Why do you hate puppets so much? I think we need to unpack this a bit more.

crickets

So you were an English teacher in challenging schools. Fast forward, you've written an international sensation of a book. What happened in between? What caused the awakening?

Part of it was a nagging feeling that something wasn't' right. All the examples in the book are backed up – they're referenced from Ofsted inspections or consultants or ITT. There were other things that I put in the book that were also pretty bonkers. You would hear consultants talk about 'talkless teaching' – there was this point where if you were actually intervening or talking or teaching, you must be doing something wrong. It was a nagging feeling that it was wrong. It didn't make sense. What you're inclined to do is think 'Well, all of these people are saying the same thing. It can't be them; it must be me.' The awakening led to me reading more, and researching more, and realising that evidence suggested maybe my nagging feelings had something to them.

What kind of things were you reading?

Willingham, obviously. That was a lightbulb moment. And the first real insight I had was reading Hirsch, and his *Cultural Literacy*. Thing about that is that it's – as Willingham says – a book about cognitive science, and all the heat and the light is generated by the list of the facts at the end. I then read a bit by Herbert Simon – who is enormously interesting, one of the great polymaths of the 20th century – and his work on chess players, how they think and learn. And he was incredibly insightful. And realising that there's this research out there by a Nobel Prize winner, that was completely contradicting so much of what I was hearing in teacher training.

And that inspired you to write?

It did. I got so frustrated hearing what I was hearing. It's hard to imagine now but back in 2009, 2010, these ideas were things that people just took for granted – 'You can just google it.' It was just so frustrating. Everyone saying these things. And there was all this evidence out there by serious people saying, 'No, this is not the case. It's not how we learn, you can't rely on Google, you can't access memory through the cloud.' And that was how *Seven Myths* came about. They were just the seven things I got most annoyed by.

Can you summarise the main ideas?

The über myth is that facts don't matter or knowledge doesn't matter. It's been around a long time, at least back to Rousseau. The modern conception around thinking skills, and so on, they seem very modern but they are actually a rehashing of things that are over 100 years old in some cases. And the reason why facts do matter isn't an ideological argument. It's an evidence-based argument. We need facts in long-term memory in order to think, because we have working memory and long-term memory and our working memory is very limited, and long-term memory is the seat of all intellectual skill. Working memory can only hold four to seven items of information in it at any one time, so whenever you solve a problem, your working memory can very quickly become overwhelmed. So particularly with very young children, you give them a multiple-step maths problem. If they're not secure on their maths facts and processes, by the time they get to the end, they've forgotten the beginning. That's not because they're stupid. We've all got a working memory issue.

The reason why facts do matter isn't an ideological argument. It's an evidence-based argument.

So, the idea is to get as many facts or chunks of facts into long-term memory as possible, and free up that precious space in working memory. That's the value of e.g. maths facts. It's also necessary if you want to be able to read and you want to read fluently, but you don't want to have to sound out every word or stop to look up every word in the dictionary. If you have to do all that – as you'll know from learning a foreign language – then you quickly get overwhelmed. But when you can read fluently, it's a smooth process and you can read for hours and not get tired and enjoy the act of it. But if you stop and start, it's not a pleasant process and you can't enjoy the meaning.

But surely nobody is against teaching facts?

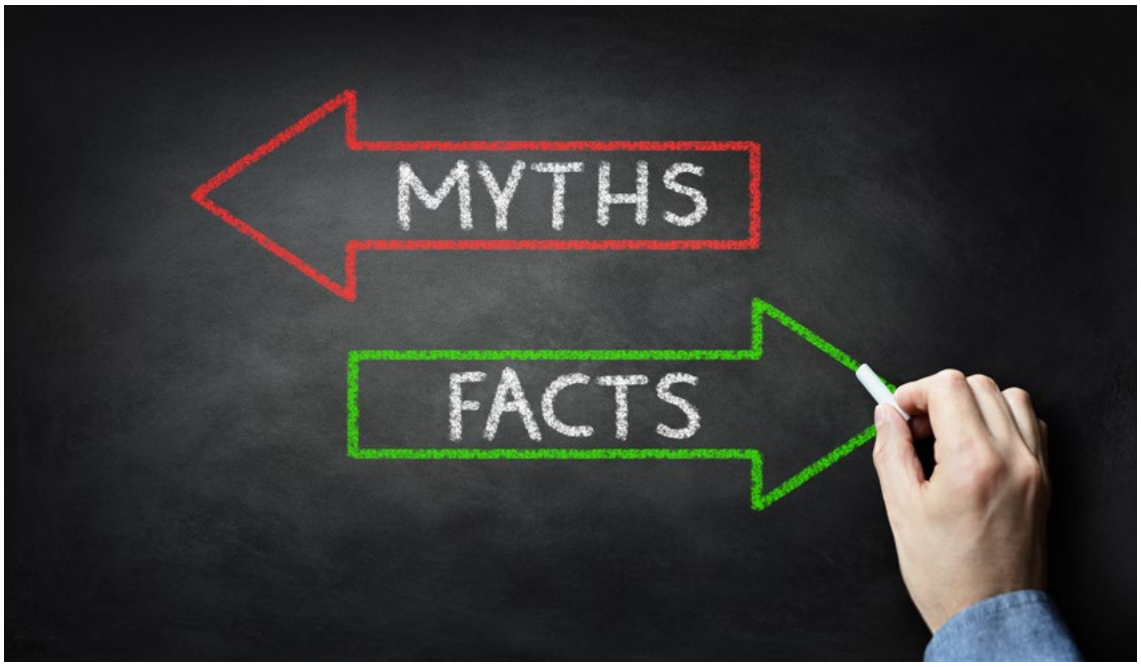
(Laughs) That's why the structure of the book is designed to try and show you that some people actually are against teaching facts. That's why the structure of each chapter is 'What does the research say?', 'What are people saying today in theory?' and 'What are recommending in practice?' I structured it like that because a lot of the rhetoric in education is frustrating.

You'll get some who'll spend a chapter saying why facts are bad, and projects are great. I'm not against teaching facts. It's very easy to spend a long time dismissing facts, rubbishing facts and then saying 'But of course we're not against teaching facts.' So what I wanted to do was to try to move beyond an argument about words and to actually look at practice. What is the actual lesson advice you are expected to follow? The moment you start to dig into that you realise that all the types of lessons and practice that people were recommending were disagreeing with what the evidence said. And lots of lesson types that fitted the evidence were being dismissed as worst practice.

The best example of this is direct instruction. DI has an enormous research base behind it, huge amounts of evidence. Whenever you try to deploy DI-style tactics in a lesson, people will react with horror. It was the kind of thing you saw in the literature; the advice teachers were getting was to avoid that kind of approach.

Where was this advice coming from?

The whole point was that I was trying to find reputable examples of people in authority who were recommending this. And that's why I often go back to Ofsted. It's not because I think Ofsted were the only ones responsible. There were a lot of people doing this. The issue with



Ofsted is that everyone accepts their authority and they have a very big record of their reports. But it wasn't just them. The whole general world view reflected it. Ofsted weren't saying things that were controversial to the wider world. They weren't criticised for this. They were criticised for other things. I should say that I think Ofsted have gone through a big reform process and have changed a lot of this.

I asked online what people thought the impact had been on them. There was a deluge of support from people talking about the immensity of your influence. Were you surprised?

Yes! It felt quite niche. I remember going through all the Ofsted reports and I was thinking 'This is just a moment in time. In one country in one system. Who's going to be interested?' I thought it would be quite ephemeral, and it might date because of the reports and era it was in. But I'm most pleased that people are still reading it – and that it was controversial to begin with, but that as time has gone on, and people have thought about it, it seems to have people warming to it. It wasn't intended to be an ideological polemic. It was meant to be about the evidence; 'Here is the state of how we learn.'

If you were publishing it for the first time today, would you change anything?

No, I think it's fine as it is. Although the thing I realised needed expanding very quickly was assessment. I think there's a section in *Seven Myths* – very short – where I'm critical of teacher assessments. It's just a couple of lines, and there were clearly a lot of people who seized upon that and thought, 'Oh she just wants teaching to the test.' What happened was that people associated a knowledge-based approach with teaching to the test or a massive exam focus. I realised – that was just a couple of sentences – I didn't talk about exams very much at all. And they are such a massive part of our modern education system that I realised we have got to address that. Because there are massive problems with the way some teach to the test, there are legitimate critiques about the exam factory model of schooling that I have a lot of sympathy for. And I'd always been aware of that. I didn't address it enough in the book. You can't address education without this discussion: the role of exams.

Seven Myths *became very well known, especially in the UK. How did you get from that to assessment?*

When I read the responses to *Seven Myths*, it felt like the most interesting arguments were about exams – how does this fit in with them? The second thing: I was working with schools about how to make some of my ideas a reality, and what I realised very quickly was that you can't do anything about curriculum – especially in English schools – unless you do something about assessment.

Why?

Look at GCSEs. I was working at this when levels were abolished. Even at primary, if you try to introduce a new curriculum approach, people instantly say, 'How can I level this?' So for example, say you want to bring in a direct instruction approach. How do I give a level at the end of it? If your new system of curriculum doesn't match up with the way you assess it currently, you have a problem. And that was the issue I kept running into. Look at DI programmes like expressive writing. That doesn't fit very well with an old UK national curriculum approach. So what do you do? Tweak it? Or do you bring the levels in? Change the assessment? To what?

So when you started to look into assessments, where did that lead you?

The big thing I struggled with, this idea that you just separate formative and summative assessment. Because when I started teaching, what you were seeing was lots of assessments that you would do six times a year, and the problem with that is you were assessing big, complex

Daisy appearing on the popular UK quiz show University Challenge

tasks. But these big, complex tasks, like essays, just because they're in an assessment, actually they're like projects. One of my arguments is that projects are not a good way to learn. But if you are assessing kids with a big complex task every six weeks, you don't have the time to be breaking that task down into smaller chunks. And the big argument in *Seven Myths* is that we need to decompose the skill. As a practical example, as an English teacher, you try to judge a piece of writing.

A great book published a year ago, *The Writing Revolution*, is really good on this. The problem it says we have is that we aren't training them to do writing; we don't teach writing, and that is exactly the issue I find. That we were assessing writing – a lot – but at what point do we sit them down and say, 'Here are the nuts and bolts of writing'? When you break it down, this is what you need. This wasn't compatible with a levelled or even a graded approach. Because when you grade or level you do want to assess a large piece of writing. So, when you teach it you want to break it down. And the analogy I use in *Making Good Progress* is that when you run a marathon, 26.2 miles is the end goal. But nobody, unless you're already an elite marathon runner, no one begins by running 26.2 miles. Nobody runs 26.2 miles in every training session. And nobody thinks that the way you make progress to your end goal is by running marathons. So people do all kinds of other tasks. They go to the gym. They do cross-training, swimming, shorter runs, speed work. And all of those tasks go towards the complex goal.

So that's how I got so involved in assessment: by realising that if you wanted to focus on a knowledge-based curriculum, I realised that the only way you could properly do it was within the framework of the assessment you were working on.

Which leads us neatly to comparative assessment.

As an English teacher, the biggest thing is that assessing writing is really hard. The minute you are writing in an extended way, those pieces are extremely hard to mark reliably. And not only that, but they start to have a negative impact on teaching and learning. Because what you end up with is marking to the rubric. And the rubric might say something like 'uses vocabulary originally…'. There's a list of things that define good writing. And the problem with that is that those sentences end up becoming the lesson objective. This creates the problem that you're not teaching at the nuts-and-bolts level. You're teaching at this generic level. You start saying things to students like 'You need to infer more insightfully.' Hang on, how helpful is that? The whole point of feedback is to give people something they can do next. The rubric isn't designed to be helpful like that! But it's not even that useful for markers, because two different markers can interpret the same line in different ways.

So what comparative judgement tries to do is to help with reliability, efficiency and validity. The first two are quick wins. You get much better agreement and you'll get there much quicker. And that's amazing. There's another benefit: it lets you move away from the rubric. So when you look at two pieces of writing beside each other and you ask, 'Which is the better piece?', you just go on your gut instinct on your knowledge of what good writing is. And the power is that you move away from teaching to the rubric.

How do people criticise this?

I think people find it odd at first when you move away from the mark scheme, when you say use your gut instinct. They're quick to ask 'How do I know my gut instinct is right? And even if it is, what about everyone else's?' The way you get around those issues is that the thing about comparative assessment is that it generates an enormously sophisticated model. You have data on everyone's judgement and every judge, so you can tell if the judge is an outlier. And it's quite rare. So you can see if they're in line with the group or not. The initial criticism is that 'this just feels hopelessly subjective'. But we can prove it isn't, because we can show you after that the reliability you get from this, the agreement and consistency between judges in the room is greater than the process with a rubric. And we can prove that. It feels subjective, but it isn't; and marking with a rubric feels objective…but it isn't.

What's next?

I'm still very involved in assessment. But I really want to do some writing on education technology. Comparative judgement is quite a tech approach so I've been thinking about it, And what I find fascinating is that here are some really amazing innovative examples of tech use, but there are also a lot of gimmicks. And being in the world of ed-tech at its worst can feel like education from years ago: 'Kids don't need to know stuff, they can just google it.' That is like a mantra in ed-tech. It's early stages, but I want to find out which approaches in technology work with the mind and are going to help learning, and which ones aren't there yet. It might be, in some ways, similar to *Seven Myths*, because it'll be looking at different approaches to technology and wondering which ones are working with the grain of how our minds work and which ones aren't.

Seven Myths of Education (2014) is available to buy from Routledge. *Making Good Progress* (2017) is available from Oxford University Press.

THE GRATEFUL PED(AGOGUE)

WHY GIVING THANKS MAY BE A GIFT THAT GIVES TO THE GIVER

Joe Kirby

From the philosophers Epictetus and Confucius to our own parents and teachers, wise thinkers have always encouraged us to count our blessings. Joe Kirby puts this sage advice to the test, and explains why it's great to be grateful.

The secret to happiness? Gratitude – or so the Greek philosopher Epictetus said in Rome, some 2000 years ago. In Ancient China, Confucius said it was 'better to light one small candle of gratitude than to curse the darkness'. Buddhists put it even more succinctly: 'grateful heart – peaceful mind'. For centuries, great thinkers around the world have taught this simple idea: 'Want to be happy? Be grateful!'

Let's put this ancient wisdom to the test of modern science and see what psychologists have learned. What actually happens when people express what they're grateful for?

Research

Two decades of seminal psychological research studies have found that after practising gratitude, people say they feel happier. In two studies, people wrote nine weekly gratitude journal entries, or daily entries for two weeks.[1] Both groups reported better wellbeing, optimism and social connectedness than control groups. These studies were replicated with a third group.[2] In another study, people kept a daily gratitude journal for a week, and reported lasting increases in happiness, even six months later.[3] A 2006 study found that practising gratitude raised and sustained positive mood.[4] But this was only with adults. What about teenagers and children?

A 2006 study of 221 young teenagers asked them to list five things they felt thankful for daily for two weeks. This enhanced their optimism and life satisfaction and decreased negative emotion, including after a three-week follow-up.[5] A 2009 study found that children with lower positive emotion levels especially benefit from gratitude interventions.[6] Two more studies replicated the findings: writing gratitude letters increased participants' happiness and life satisfaction.[7,8] **After ten years of clinical trials, the world's leading scientific expert on the topic, Robert Emmons, concluded that gratitude makes a measurable, positive impact on happiness.[9]**

Other researchers found that people reported that gratitude improved relationships.[10,11,12] Further studies also found that expressing gratitude increases people's patience.[13,14]

One complication comes out of this research. One study suggested weekly appreciative writing outperformed daily.[15] Perhaps writing too frequently loses freshness and meaning?

A recent trial, just published this year, involved students seeking counselling for depression and anxiety, with clinically low levels of mental health. They were divided into three groups: one wrote gratitude letters, one group wrote their deepest thoughts about negative experiences, and one did not do any writing. What did they find? Those expressing gratitude reported significantly better mental health four weeks afterwards – and even larger effects 12 weeks afterwards.[16] Perhaps Confucius was right.

Three applications in schools

How might we apply these research insights in schools?

1. Termly postcards to teachers

Once a term in forms, tutors can give students gratitude postcards to write to teachers that have made a difference in their lives. It is easy for students to forget how much teachers do for them. It makes children feel happy to notice and acknowledge those who support them. It also makes teachers feel happy to be thoughtfully appreciated. Teachers can model this by writing appreciative postcards to one pupil each day. If a school does this, each year, teachers will have written 200 cards, and there'd be some

10,000 acts of encouragement. Students like showing these to their parents to make them feel proud. Some display them proudly on their fridges at home. Some students I know even keep and frame postcards they earn over the years!

2. Termly postcards to families

In forms, tutors can ask students to write gratitude postcards to their own parents, siblings or families at the end of term. It is hard for children and teenagers to remember how much the adults and family members in their lives do for them, and how sad they'd be if they lost them. Students and parents feel much more positively about the school when they see how much their family relationships matter to teachers.

3. Thanks to end lessons and form

Every day, teachers and students make great efforts. Leaving lessons creates an opportunity for students and teachers to say 'Thank you!' to show they appreciate each other. If both say 'thank you' politely as they part, this creates a very upbeat atmosphere around the school. Combine this with a mantra – 'It's great to be grateful!' – to encourage students who are appreciative. Assemblies on the benefits of gratitude can help children understand why it's helpful in life to really notice the good things we have in our lives.

Applying the research of gratitude is a promising way of helping children, teachers and families feel happy about school.

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HARDER, BETTER, FASTER, LONGER?

Rebecca Foster

Rebecca Foster explains how to introduce 'desirable' difficulties into your teaching – and why learning shouldn't be easy.

'The mistake we pop stars fall into is stating the obvious. "War is bad. Starvation is bad. Don't chop down the rainforest." It's boring. It's much better to hide it, to fold the meaning into some sort of metaphor or maze, if you like, and for the listener to have to journey to find it.'

-Sting

The fetishisation of ease is ubiquitous: you only need to look down at your smartphone to see how advances in technology have converged to squeeze a multitude of processes into one hand-held device for your convenience – a camera, easy access to cat videos and social media all in one place! We don't even have to get up from our sofas to change the TV channel or rely on a map to get us from A to B anymore. But at what cost this ease? In making life as easy as possible, what are we losing? Aren't some difficulties in fact desirable?

These are questions we ought to be asking of our classroom practice too. When we make learning easy in the classroom, what is the cost? The work of Bjork and other researchers suggests that practices that 'appear optimal during instruction',[1] such as massing study sessions and blocking practice, 'can fail to support long-term retention and transfer of knowledge'. Whereas introducing certain difficulties that 'slow the apparent rate of learning', such as reducing feedback to the learner and interleaving practice on separate topics or tasks, 'remarkably' has the opposite effect.

Bjork asks the question why, 'if the research picture is so clear', are 'massed practice, excessive feedback, fixed conditions of training, and limited opportunities for retrieval practice – among other nonproductive manipulations – such common features of real-world training programs?'[2] One answer, in school contexts, might be a type of 'operant conditioning' teachers are exposed to. Several school systems serve to reinforce practices that encourage the teacher to increase the performance rate of their students to satisfy a demand for 'rapid progress'. For example, frequent data-trawls encourage teachers to teach in a way that will maximise the short-term performance of their students. If I have to enter data on a student six times a year, and especially if that data is used to judge my performance as a teacher or inform the pay I'm entitled to, am I not motivated to do what's necessary to push students over short-term hurdles? Notwithstanding the perfectly admirable desire as a teacher to see my students perform well.

As teachers we may also be led to favour practices that increase performance at the acquisition of learning stage because many of the 'desirable' difficulties Bjork suggests will produce 'the best retention performance'[3] result in 'poorer performance' at the point of learning new information. It's manifestly unintuitive to a teacher to degrade the performance of students in the classroom. It's a bit like confiscating everybody's satnavs: probably not a great idea if their timely arrival on a certain day is important; but if you want people to get better at finding their way in the longer term then it's a sensible strategy that has merit.

It's a bit like confiscating everybody's satnavs: probably not a great idea if their timely arrival on a certain day is important; but if you want people to get better at finding their way in the longer term then it's a sensible strategy that has merit.

While short-term performance goals are understandable, our sights as teachers need to stretch far beyond the end of the lesson, unit or course of study. With supportive whole-school structures, teachers can be freed up to introduce desirable difficulties that may impede short-term performance but have long-term positive impact.

I've been leading the English department at my current school for two years and have introduced a range of 'desirable difficulties' that have been a challenge for both teachers and students. However, the effectiveness of the learning taking place in the English lessons in my department is revealed by the level of retention demonstrated by our students over time.

Distributing practice

One of the biggest changes I introduced was a move away from massed practice or traditional term-long units of study. In the past students might study a novel for a term and then move on to study creative writing followed by four other units – each conveniently one term long. I can only assume that the rationale for the length of the units was because that's how the year is broken up and an end-of-unit assessment would fall just before a data drop, with all of the work leading up to that building the knowledge and skills necessary to perform well in that assessment. However, when that topic was returned to a year or more later, students' long-term recall or performance was hindered by this approach.

Now, at KS3, we have two key units that are studied for roughly half of the year: a novel and a Shakespeare play. These are interleaved with studying poetry, fiction writing, non-fiction writing and analysis of both fiction and non-fiction. In practice this means that no two English lessons within a single week are on the same topic. Whilst this was a real challenge for teachers at first, our students haven't been in the least bit phased and we've seen the impact this model has had on the development of our students' knowledge and skills.

Of course, were I working in a school that demanded an assessment every six weeks, I may find myself in hot water; but thankfully, I work in a school that only requires one data entry a year at KS3 and two or three at KS4.

Using tests as learning events

Lots of evidence points to the idea that recalling information is more effective than a further study event and also serves the purpose of providing feedback to students about their current knowledge or a given topic. In my department, we have introduced a range of tests as learning events, including retrieval practice starters and knowledge tests. One of the most effective things we've introduced, after reading *Battle Hymn of the Tiger Teachers: The Michaela Way*, is self-quizzing homework. Students are required to test how much they can recall from their knowledge organisers and then, in a different coloured pen, fill in any gaps or make corrections. Not only is this weekly, structured activity improving students' learning of key knowledge, but it's also providing regular feedback to both teacher and learner about what they know or don't know. Furthermore, it has the added benefit of not needing to be marked – a difficulty that is certainly not desirable!

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LEARNING STYLES

THE GREATEST TRICK THE DEVIL EVER TRAINED

Jennifer Beattie

It wasn't so long ago that training teachers in the UK were taught almost entirely uncritically to use learning modalities (learning styles) like VAK as an allegedly 'evidence-informed' way to help students learn. How wrong they were. Jennifer Beattie, a teacher from East London, takes a trip down memory lane and recalls how common it was even in her career – and still could be if we're not careful.

Recently, I was involved in a discussion on edu-Twitter with teachers who were reflecting on their training. A significant number of them were critical of the fact that certain aspects of pedagogy that they'd been trained in had not stood the test of time. Being professionals, we recognise how training evolves and practices change. What trainees are being told to do today could well not exist in a few years' time. The concept of VAK learning styles (visual, auditory and kinaesthetic), however, somehow stills continues to spark debate, despite us all knowing that making your teaching resources visual, auditory and kinaesthetic would be as helpful to pupil progress as it would be to make your resources about *Love Island* or *Fortnite*. I understand why the idea still exists. It's a comfortable way of attempting to deal with an uncomfortable truth: not all pupils learn and make progress at the same rate.

Yet, I have to admit that I believed in learning styles whilst training – and still for a large part of my early teaching career. I recognise that my ITT experience is simply reflective of what Ofsted (the UK school inspectorate) and the DFES (the then Department for Education and Skills) wanted at the time and my course tutors were simply channelling that into us. That time was 2007; that progressive era of, notably, 'The One-off Outstanding Lesson', mini plenaries, student-led 'discovery learning', Brain Gym and P4C (Philosophy for Children).

With the aim of reminding myself why I was such a devout believer of VAK back then, I dusted off my QTS Standards folders and books. I found one, entitled *Learning and Teaching in Secondary Schools*. In it, there were six pages devoted to learning styles and 'multiple intelligences'. Of these six pages, nine lines were given over to 'Learning Styles; a critique', where the writer admits that it is, actually, very difficult to define learning in such different ways. This isn't developed further in the book.

> Making your teaching resources visual, auditory and kinaesthetic would be as helpful as making them about *Love Island* or *Fortnite*

What I find most incredible in these pages is that they mention a possible 'mismatch' between a student's 'preferred learning style' and the tasks they face from the teacher. It's outrageous to tell new entrants to the profession that a possible reason why a pupil isn't learning is because the teacher hasn't engaged with the

student's preferred learning style. I can only imagine the sheer number of PGCE student hours wasted, trying to make that elusive, 'engaging' resource which will appeal to all sorts of learners. I know this because I did it.

When I think back to the time taken up with trying to make things like the 'passé composé' kinaesthetic ('Right, let's MOVE the pronouns and auxiliary verbs that I've spent hours laminating for you all, shall we, class?'), I reflect that I could have actually been learning ways to *explain* it better and give pupils adequate, robust practice. No wonder I am exasperated with having been caught in the nonsense of it all.

Furthermore, in my professional standards portfolio, much of the evidence I gathered to prove I'd met a particular standard comprised of lesson plans with VAK ideas and resources. As a trainee, the lesson plan pro forma had a box specifically for planning and detailing your VAK resources to be used. But, were trainees *explicitly* told to include VAK learning styles in order to gain Qualified Teacher Status? In the 2007–08 Standards, there was a real emphasis on 'personalising learning'. Trainees were told that you should plan your lessons to engage with all pupils' individual learning styles and preferences. This turned into tutors expecting to see VAK on every trainee lesson plan. Even the training book mentioned earlier issued a stark 'warning' about it:

'In order to progress towards meeting the Standards for the Award of Qualified Teacher Status (QTS) it is important that beginning teachers are aware of the different learning styles that might exist in their classes and what might be some characteristics of individual learning preferences.'

I have been asked why I am now so critical of VAK, when I wasn't ten years ago. Well, for one thing, experience. Experience as a teacher has shown me that telling pupils the rule about the past tense in French gets you better results than making a game of it. Experience has shown me that telling the pupils what a word means gets you a quicker result than making a 'card sort' game. I didn't have this experience ten years ago: there wasn't much research debunking it; and when someone tells you that you have to include it in your lesson plans and observed lessons to meet the standards, in all likelihood you're going to do it!

So, while this was a brief, nostalgic look back at what it was like to be fully submerged in the VAK pseudoscience of 2007, it is important that, as teachers, we don't allow it back in. I still see a lot of new entrants to the profession worry about why some pupils aren't 'getting it' and some of the advice dispensed encourages them to try matching their teaching and learning activities to their students' different styles of learning. We cannot allow more trainee and NQT hours to be spent trying to create 'perfect' lesson resources. The best resource, for any lesson, is the teacher.

EDUCATION, LITERATURE AND THE PARADOX OF 'THE WHOLE CHILD'

Professor Robert Davis

Professor Robert Davis of the University of Glasgow writes a poignant reflection on the Plowden report, which defined the era of child-centred education for the generation for which it was written – and for decades to come.

2017 was the 50th anniversary of the Plowden Report (*Children and their Primary Schools*), a landmark document in the history of 20th-century progressivism, which announced major reforms in curriculum and pedagogy across the schools of the United Kingdom and which echoed powerful modernising impulses elsewhere in the developed world. The elusive search for the origins of 'progressive education' has led some historians to question its entire viability as a concept for capturing an undeniably broad and piecemeal diversity of 20th-century educational innovations. Nevertheless, wherever we trace its roots, it seems clear that a number of key concepts steadily became dominant in educational thought on both sides of the Atlantic between 1920 and 1960 (to the undoubted reproach of the didactic models of learning and teaching that had monopolised schools since the coming of state-sponsored mass education to the industrial nations in the closing decades of the 19th century). Paramount among these supposedly 'new' ideas was the discourse of 'child-centredness', and the language of the 'whole child' – each among the first phrases, incidentally, to excite the scepticism of philosophers of education such as R.S. Peters and Robert Deardon of the Institute of Education in London in the first issues of the *Journal of Philosophy of Education* in the middle and late 1960s.

Like 'progressive education', the terms 'child-centredness' and the 'whole child' already possessed, by the 1960s, a complex pedigree. Rousseau's direct influence in the late 18th century on (most significantly) Johann Pestalozzi had succeeded in embedding the concepts by the 1820s very explicitly in radical philosophies of, particularly, infant education across Europe and into parts of North America. By the end of that decade, Robert Owen and Friedrich Froebel were each campaigning vigorously in Britain and Germany on behalf of the revolutionary 'kindergarden' or nursery movement, where learning and teaching for very young children would be centred upon *play* and led by the interests and inclinations of the child rather than (in Froebel's model especially) the direction of the teacher. Owen's British experiments were destined to end in defeat at the hands the traditionalist opposition of church and state, while Froebel's spectacularly successful kindergarden networks nevertheless saw the language of child-centredness carefully cordoned into the specialist pre-5 environment where his thinking and reputation took root, with consequently very little impact on the expanding compulsory sectors.

Nevertheless, it is safe to say that more inclusive notions of 'child-centredness' and the 'whole child' sustained a kind of subterranean afterlife throughout the later 19th century in radical educational circles in Britain. Such ideas resurfaced in a series of immensely important government enquiries chaired by W.H. Hadow in 1926, 1931 and 1933 that heavily criticised the Victorian approaches to learning and teaching – then still prevalent in UK primary and secondary schools. The '31 document (which approvingly referenced Owen and New Lanark) declared:

We desire to see the child as an active agent in his early schooling, making … an active participation in its process, through his own experiences and his own activities, and relating his growing knowledge at all points to the world in which he lives.

Although these ideas were to be eclipsed by more pressing domestic and international anxieties as the 1930s unfolded, they survived as a subversive memory – a hope, indeed – in British educational thought until a more welcoming climate emerged with the onset of the Swinging Sixties. This period heralded the rise of a new metropolitan youth culture and the election of Harold Wilson's Labour governments in 1964 and 1966 on a platform that included far-reaching educational reform. Bridget Plowden was actually commissioned to conduct her investigations into English schools by the outgoing Conservative Government in 1963; but under the direction of the new Labour Education Secretary, the socialist intellectual Anthony Crosland, the egalitarian mission of the enquiry was very significantly radicalised. Crosland and his advisors had in turn been deeply influenced by the central, supposedly *scientific* justification for the doctrine of child-centredness provided between 1930 and 1960 by Jean Piaget's model of developmentalism.

Contemporary 'neo-traditionalists' mock Piagetian theory for what they see as its poor empirical evidence base, but Peters, Deardon and others discerned at the time a deeper problem. On the one hand, the new mid-20th-century progressivist discipline of 'educational psychology' was advocating an optimistic, unfettered view of the child's predisposition for learning perfectly aligned with Plowden's reformed pedagogy. But on the other, the work of some of the most influential psychologists and anthropologists of the time was describing a quite different child secreted at the heart of modern society: an anxious, troubled, aggressive creature trapped in the gothic Freudian-Kleinian struggles of the family romance, or self-centredly and unempathetically striving for dominance over rivals in the pursuit of its appetites and an obviously unappeasable desire for security. It was for this reason that the earlier Hull House experiments of John Dewey in Chicago had eventually repudiated the dominant American Froebelian conception of the kindergarden as a reproduction of the domestic emotional ambience of the family, in favour of the rigorous cosmopolitan practices of the 'peer group' and the 'school community' supposedly so critical to the fortunes of an essentially immigrant society. If the family is intrinsically psychodynamically maladaptive, Dewey had argued, effective education could not possibly proceed from the imitation of its affective life or its understanding of the child. The 1960s were also, we should recall, the era of Phillipe Ariès's *Centuries of Childhood*, which in bowdlerised form had found its way into the textbooks of many caring-profession diploma and degree programmes – instructing intending nurses, doctors, teachers, social workers that childhood and the nuclear family were contingent, bourgeois ideological constructions of the very bureaucracies they were training to serve. The extraordinarily popular Scottish psychiatrist Ronnie ('R.D.') Laing, a media hero of many '60s 'liberation' movements, turned most vitriolically on the family and its supporting institutions, denouncing them as the cradle of injustice, oppression and patriarchy, producing only damaged children and frustrated adults, and against which schizophrenia was a perfectly valid emancipatory protest.

Even Piaget himself became part of this same malaise through the use in his writings of a concept for the description of early childhood which he later came to regret: *egocentrism*. Now for Piaget, the term was confined to the description of purely epistemological processes, not affective or moral states. But in the psychoanalytic climate of the period, it is unsurprising that it was swiftly mobilised for estranging and othering children, culminating in the notorious observation in the best-selling mid-century teacher training manual by Hughes and Hughes, *Learning and Teaching*, that 'it is well known that young children are, as a general rule, determined little egotists'. A host of popular and influential figures – led by high-profile academics such as Bowlby, Winnicott and Gesell – compounded this problem by foregrounding a developing child characterised by innate aggression, violent fantasies of control and group destructiveness. There were variants within this literature, across gender, age-band and social class especially, but the trends remained consistent; and such was the prestige of these authorities that their ideas routinely migrated into formal guidance for schools, teachers and even parents.

These difficulties were of course cultural as well as educational, and their cultural dimensions have been so far largely neglected in the critical assessment of the coming of Plowden progressivism. But Plowden both reflected and stimulated a new climate in teacher education in which the study of, for example, children's literature was earnestly cultivated for both aspiring teachers and their pupils as a potent antidote to the previous supposedly failed models of instructional literacy. This was also pivotal, of course, to the success of any effort to export child-centredness beyond the pre-literate, pre-compulsory confines of the nursery into the later stages of childhood. Hence the education of the 'whole child' championed by Plowden in England, and by the so-called 1965 *Primary Memorandum* in Scotland, would abandon in schools the force-fed language training and decontextualised literary comprehension extracts of the old system in favour of the 'real books' and the appreciation of valuable works of literature to which children and young people might be instinctively attracted when shared appropriately with them by their suitably well-read and sincerely 'child-centred' teachers. This is a principle that has of course remained absolutely central to mainstream literacy teaching in most democratic education systems for the past 50 years, and the examination of Plowden advanced in this analysis does not seek to overturn it. But just as the 1960s psychological messages to beginning teachers from their formal programmes of study (as well as their surrounding culture) were paradoxical ones, so also the otherwise salutary advocacy to them of high-quality children's literature was also singularly ambivalent.

Some of the finest books for children and young people that accompanied the Plowden Report off the printing presses of 1967 and 1968 dealt candidly with experiences of childhood and youth which – reflective no doubt of the volatile, contradictory tensions in that same surrounding society – were rarely celebrated for the presentation of 'whole' children or of benign, 'child-centred' environments.

Leon Garfield's Carnegie-honoured and hugely popular *Smith* (1967) described a deprived Regency pauper childhood of exploitation and treachery, where childhood is neither special nor valued and where the pursuit of a defining *trust* (a cornerstone assumption of progressivism) between adults and children is as elusive as the literacy which – when eventually acquired – simultaneously empowers and mortally imperils the central character. In the same vein, the Carnegie Medal Winner of 1967 – and certainly one of the best and most influential children's books of the last 50 years – Alan Garner's *The Owl Service*, presented a dark vision of childhood forever in thrall to the sins and repetition-compulsions of the adult generation, condemned interminably to repeat the same cycle of errors and betrayals across the epochs regardless of environment or circumstance.

The Owl Service also audaciously probed further into the cultural territory in which Plowden's optimistic account of childhood, and adult-child relations, had pitched its claims. As well as highlighting an almost genetic taint passed across the generations, and destined to pollute indelibly the faltering communications between adults and children, *The Owl Service* engaged with the experience of 'youth' – just at a time, indeed, when this fugitive cultural category was beginning to overtake 'childhood' as the primary focus of 1960s educational solicitude and artistic preoccupation. Garner daringly highlights single-parent and blended families stamped by class, regional, linguistic and postcolonial ethnic divisions. The novel also famously unleashes intense sibling and sexual rivalry into the narrative, in forms darkly reminiscent of the forces claimed by the influential analytical psychologists of the time to be pervasive and determinant in the lives of children and young people. There is, of course, a moment of redemption in *The Owl Service*: a terminal renunciation by one of the central characters, the priggish Roger, which finally rescues the doomed Alison from the vindictive clutches of the past. But it comes at immense cost, with the socially and ethnically excluded Gwyn left both unreconciled and in full possession of the ineradicable knowledge of his family's myriad ancestral crimes.

Even those children's books of '67–'68 – popular in both wider society and the expanding network of teacher training institutions which focused directly on the experience of school, or of simply becoming educated – rarely presented these settings in benevolent, 'child-centred' terms. Barry Hines's 1968 *A Kestrel for a Knave* – memorably adapted as the Ken Loach film Kes (and thereafter often taught in schools too) – described somber northern English schools marked by casual violence, bullying, extreme physical punishment, routine humiliation and the pervasive alienation of pupils and teachers. Even the teacher with a heart in the novel, Mr Farthing, can only seriously identify with the central character Billy around the nurture of the kestrel – the injured bird with which the boy has bonded standing for the brief moments of flight from his bleak domestic and educational existence. Hines's contribution in *Kes* stood with a group of important writers for children reminding the '60s generation, and the large teacher-influx within it, that many working-class schools in Britain operated in ways far removed from Plowden's principles, serving children and young people whose lives, learning and identities were far from 'whole' or integrated.

The pursuit of such 'wholeness of being' marks another text hugely popular with late-'60s readerships and which in the decades since has only accrued increased esteem and recognition. The late Ursula Le Guin's 1968 *A Wizard of Earthsea* was a gift to the grammar-school Tolkien generation, flush with the countercultural values that were sustaining the environmental movement, hippiedom, the anti-Vietnam protests and the idealism of the Summer of Love. *Earthsea* was instantly celebrated for its retrained ecocentrism, its laid-back Zen-style wisdom of naming and knowing and its invocation of alternative styles of archipelagic working and being closer to nature and other living things. Insofar as *Earthsea* is an intrinsically *educational* text – concerned with the training and instruction of the boy-mage prodigy Ged at an elite wizard school – all of its conditions at first seem ideal for a child-centred, holistic conception of learning and personal discovery of precisely the type envisaged by Plowden and its related literature. Yet, as we know, Ged's education takes an unexpectedly malevolent turn, when from his unquenchable curiosity and juvenile individualism (qualities unstintingly celebrated in progressivist literature) he inadvertently unleashes the destructive havoc of a shadow creature – and which he, maimed and incapacitated, must spend the rest of the novel seeking to undo. *Earthsea*, thereafter, becomes a kind of bildungsroman – a journey of the traumatised Ged into the realms of Earthsea beyond the confines of even this most inclusive, holistic society where he can begin his education again and in an entirely altered and humbled state of mind. We might go so far as to say that Ged needs to become a *decentred* learner, whose brokenness and injury take the focus away from him and on to the setting and the personalities whose needs he must learn to serve with his impaired magical talents. This shift in perspective is most fully underlined at the climax of the story, where reader and protagonist each discover that the abomination Ged must seek to recapture and subdue is the abject, refractory elements of his own self, sharing his name and his identity:

Alone and clearly, breaking that old silence, Ged spoke the shadow's name,

And in the same moment the shadow spoke without lips or tongue, saying thesame word: 'Ged'. And the two voices were one voice.

Alone and clearly – I emphatically do not invoke *Earthsea* or any other of these novels as a casual repudiation of Plowden or any other investment in child-centredness, yesterday or today. I wish only to suggest here that the social, cultural, and literary ambiguities of 50 years ago, like those of the present time, require that we think through – again and again – the emblematic educational slogans of every era in which we practise our professions, recognising that the resources of art and literature can assist us immeasurably with the task of understanding the inevitable incompleteness and vulnerability of ourselves and of the children and young people in the classrooms before us.

MYTH-BUSTING

Every issue, Dr Pedro De Bruyckere takes aim at a common educational theory and summarises the evidence for and against it. This time, it's Gardner's multiple intelligences in the hot seat.

THERE IS SOME TRUTH IN EVERY LIE: MULTIPLE INTELLIGENCES

In the last issue of **researchED** magazine, I discussed the grains of truth inside the learning styles theory and I'd like to follow that with something that is often mistakenly used as a kind of learning styles theory: the multiple intelligences theory by Howard Gardner.

What does it state? That we should look to more than just IQ in education. Gardner thought it too narrow to see 'intelligence' as one single thing. So he added different modalities of intelligence, such as:

- musical-rhythmic
- visual-spatial
- verbal-linguistic
- logical-mathematical
- bodily-kinaesthetic
- interpersonal
- intrapersonal
- naturalistic

This list has been adapted a few times; somebody even suggested adding gastronomic intelligence.

In an interview with Kathy Checkley in 1997,[1] Gardner explained that this theory shouldn't be used as a learning style approach:

A myth that irritates me is that people place my intelligences on the same footing as learning styles. Learning styles say something about how people approach everything they do. If you are good at planning, people expect you to have a plan for everything you do. My own research and observations lead me to suspect that this is a wrong assumption.

But there are more issues than this. In my book,[2] we've already debunked this theory; but little did we know that Howard Gardner would drop a tiny bombshell a bit later in a kind of memoir looking back at his academic life.

I want to share with you three telling quotes by the man himself. One of our criticisms was that the word 'intelligence' is a bad choice as it suggests a predictive power – which Gardner's theory does not have. Now Gardner explains:[3]

I termed the resulting categories 'intelligences' rather than talents. In so doing, I challenged those psychologists who believed that they owned the word 'intelligence' and had a monopoly on its definition and measurement. If I had written about human talents, rather than intelligences, I probably would not have been asked to contribute to this volume.

Ok...but it gets worse. Did he test his theory?

I readily admit that the theory is no longer current. Several fields of knowledge have advanced significantly since the early 1980s.

Nor, indeed, have I carried out experiments designed to test the theory. This has led some critics to declare that my theory is not empirical. That charge is baloney! The theory is not experimental in the traditional sense (as was my earlier work with brain-damaged patients); but it is strictly empirical, drawing on hundreds of findings from half-a-dozen fields of science.

Oh, but should his theory be used today? Well, again, Gardner himself:

At the same time, I readily admit that the theory is no longer current. Several fields of knowledge have advanced significantly since the early 1980s. Any reinvigoration of the theory would require a survey similar to the one that colleagues and I carried out thirty-five years ago. Whether or not I ever carry out such an update, I encourage others to do so.

And that is because I am no longer wedded to the particular list of intelligences that I initially developed.

Myth-busting multiple intelligences this time requires only that we use the original author himself. Now for the truth inside the myth. Even in our book, we don't want to call this theory a complete myth, but instead label it as 'nuanced'. Why? Well, the basic idea behind this theory is that people are different, and maybe you've noticed – they really are. People have different interests, different abilities, different moods, etc.

So, for example, taking into account the difference pupils have in their prior knowledge can be very productive for their learning. When pupils have less prior knowledge, for example, a more teacher-directed approach could be warranted.[4]

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KIA ORA, researchED

Briar Lipson

Briar Lipson is a research fellow at the New Zealand Initiative in Wellington. Before that she was an assistant principal and maths teacher in London. Here she writes about why she was inspired to campaign for more evidence-informed education, and how she brought **researchED** to Auckland.

The list of past **researchED** speakers includes many of my heroes. These are the people who taught me to expect all children to learn to read; how to take back my evenings and weekends; and why knowledge precedes expertise.

So when I left my London classroom for a job in New Zealand, I folded away my autograph book alongside my underground Oyster card.

Historically, New Zealand ranked highly in the international league tables of educational performance. But it no longer does. Real scores and equity have been falling for some 15 years.[1]

And most worrying of all, there is no consensus about why.

And so, less than a year after arriving, I dusted down my autograph book and brought **researchED** to New Zealand.

A little country background

Since 1989, New Zealand has operated a devolved administrative model called Tomorrow's Schools. This hands school management and accountability to communities, through local Boards of Trustees. But national, standardised assessments are hardly used. This means perceptions of schools' quality rely on other, questionable proxies – like the socioeconomic make up of the intake, or the availability of IT.

According to the Ministry of Education, the New Zealand curriculum (NZC) is world-leading.[2] Its 'front end' describes the vision, principles, values and key competencies to which schools should align their curriculum planning:

- Principles like future focus, community engagement, and learning to learn
- Values like equity and ecological sustainability
- Key competencies like thinking and managing self

Its 'back end' details 'light-touch' achievement objectives for Years 1 through 13. For example, Year 8 and 9 Social Sciences constitutes seven generic statements including: 'Understand that events have causes and effects' and 'Understand how people participate individually and collectively in response to community challenges.' Beyond this kind of high-level guidance, schools decide what and how much to teach.

Introduced in 2002, New Zealand's only national assessment is its end of secondary school certificate, NCEA. And like the NZC, NCEA is wide open to interpretation. Under NCEA, subjects from Meat Processing to Mathematics attract equal esteem.[3] Pupils and schools can select the parts of subjects for assessment, e.g. integration but not differentiation. And most assessments are 'internal', meaning classroom teachers design, deliver and mark them. It is possible to achieve NCEA avoiding external exams altogether. And even where exams are used, in many subjects questions hardly change from year to year.[4]

Finally, despite the devolved management model, the Ministry of Education still works with schools in various ways. For example, when funding new school buildings and refurbishments it assumes they will be flexible, open spaces. The materials it provides to support curriculum delivery emphasise personalised learning and 'the rethinking of learners' and teachers' roles'.[5] The Ministry also provides targeted funding to schools to run *Reading Recovery*.[6] This 'whole language' approach to reading is owned by the University of Auckland.

Complex questions proliferate in education. Untangling complex problems that are answerable with science from those that rely on value judgements is essential. And this is where researchED comes in.

And so, with some notable exceptions, policy settings here encourage diverse approaches. But without data, teachers cannot identify the schools and colleagues from which the best lessons can be learnt.

When teaching in England, I used standardised, nationally collated data to identify neighbouring schools (and even classrooms) with similar intakes but better outcomes in, say, Year 11 maths, or early literacy. This guided where I went for professional development. In New Zealand, whether you're a teacher or the minister, there is no reliable way to locate the schools from which you can learn. Collaboration is minimal. And where it does happen, teachers run the risk of 'learning' that makes their teaching worse.

Complex questions proliferate in education; all the more so in a former British dominion where underachievement is worst among native Māori and Pasifika children. Untangling the parts of complex problems that are answerable with science, from those that rely on value judgements, is essential. And this is where **researchED** comes in.

researchED NZ

In late 2017, Tom agreed to fly to New Zealand for four days in June. It was a reasonably mad idea even back then, and not only because I was starting maternity leave in April.

But it turns out that if there are seven degrees of separation worldwide, where **researchED** is concerned there are notably less! No sooner had I approached Auckland Grammar School about hosting, but I had found a fellow **researchED** enthusiast – their brilliant Teaching and Learning leader, Dr John Etty.

With this boost under my already bulging belt I put the word out to my nascent networks. The quantity and quality of session submissions was inspiring.

New Zealand's population may be smaller than Yorkshire's, but by the time the event rolled around there were 240 attendees, and 28 expert speakers, including:

- Four early literacy and phonics specialists, from England, Australia and New Zealand.
- Three researchers from Auckland University's Knowledge in Education Research Unit (KERU).
- Two Teach First NZ teachers on how standards-based teaching impacts the English classroom.
- The headmistress of one of London's most transformational schools.
- A Victoria University academic on cognitive automaticity in maths.
- The former director of Auckland University's Starpath project on the factors that enable Māori and Pasifika students to get into university.
- Four teachers (then unknown to me) from a school in the far north, on their journey to using evidence from cognitive science and quantitative research.

Since that day, KERU has launched *The New Zealand Knowledge Curriculum Research Project*. At least six attendees have started blogging; and many more are writing in the press. Our Minister has sought the voices of a wider group of experts in his consultation over changes to assessment. And the NZ edu-Twittersphere grows by the day.

Kiwis are humblingly friendly, and refreshingly laid back. However, while attendees to **researchED** NZ lived up to the first stereotype, on the latter they most certainly did not. After 15 years of falling outcomes and rising inequity, they were impassioned and hungry for evidence and fearless honesty.

If you have been inspired by Briar's story and want to host a **researchED** event of your own, get in touch with us at contact@researchED.org.uk

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researchED

WORKING OUT WHAT WORKS

What is researchED?

ResearchED is an international, grassroots education-improvement movement that was founded in 2013 by Tom Bennett, a London-based high school teacher and author. ResearchED is a truly unique, teacher-led phenomenon, bringing people from all areas of education together onto a level playing field. Speakers include teachers, principals, professors, researchers and policy makers.

'I didn't build researchED,' says Tom, 'it wanted to be built. It built itself. I just ran with it.'

Since our first sell out event, researchED has spread all across the UK, into the Netherlands, Norway, Sweden, Australia, the USA, with events planned in Spain, Japan, South Africa and more. We hold general days as well as themed events, such as researchED Maths & Science, or researchED Tech.

As far as I am concerned, researchED is one of the most exciting and important developments in education in recent years. By providing a way of engaging practicing teachers with cutting edge research, it provides, in my view, the best opportunity we have of using research in a principled way in teaching.

– Dylan Wiliam

Emeritus Professor of Educational Assessment, UCL

The goal of researchED is to **bridge the gap between research and practice in education.** Researchers, teachers, and policy makers come together for a day of information-sharing and myth-busting.

researchED.org.uk

Who are we?

Since 2013 researchED has grown from a tweet to an international conference movement that so far has spanned three continents and six countries. We have simple aims: to help teaching become more evidence-facing; to raise the research literacy in teaching; to improve education research standards; and to bring research users and research creators closer together. To do this we hold unique one day conferences that brings together teachers, researchers, academics and anyone touched by research. We believe in teacher voice, and short circuiting the top down approach to education that benefits no one.

ResearchED originated in the UK in 2013 and has since forged a community of tens of thousands of educators and of 100+ speakers who subscribe to our mission, waive their fees and make themselves available to speak at many of our conferences.

How does it work?

ResearchED is the first organisation to bring together teachers administrators, and researchers into the same space for the kinds of frank exchanges they need to have if teaching is to become evidence facing- in other words a profession, with all that entails. That there is a need and hunger for this organization within teaching may be adduced by researchED's explosive international growth. It has the potential to be a revolutionary force in education, professional development, teacher training, and the way that teachers engage with research, and vice versa.
– Professor Daniel Willingham
University of Virginia, USA

A new model for continuing professional development

The gathering of mainly teachers, researchers, school leaders, policymakers and edu-bloggers creates a unique dynamic. Teachers and researchers can attend the sessions all day and engage with each other to exchange ideas. The vast majority of speakers stay for the duration of the conference and visit each other's sessions and work on the expansion of their knowledge and gain a deeper understanding of the work of their peers. Teachers can take note of recent developments in educational research, but are also given the opportunity to provide feedback on the applicability of research or practical obstacles.

Ways you can get involved:

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CRACKING THE LEARNING CODE

Naveen Rizvi

Naveen Rizvi, a teacher of maths at Great Yarwood Charter Academy, discusses why she is committed to using direct instruction in her classroom

Connecting Maths Concepts (CMC) is a mathematics direct instruction (DI) programme. It is a packaged resource which includes a teacher-scripted presentation book, additional teacher guides for instructional strategies, pupil textbooks and workbooks with an answer key, as well as additional placement tests to provide extra worksheets for pupils who require more practice.

I used this textbook series as a remedial programme for intervention with Year 7 and Year 8 while at Michaela Community School. The CMC textbooks changed my understanding of mathematics and made me appreciate the intricate and expertly designed structure of DI. More importantly, it closed the most fundamental knowledge gaps the weakest pupils had and accelerated their learning in their mainstream lessons.

CMC has been shaped through extensive field testing. It is different from traditional study programmes because the field-test philosophy of CMC is that 'if teachers or students have trouble with material presented, the *program* is at fault'.[1] To ensure that there is no fault with the programme, DI requires there to be a significant amount of attention to all aspects of the teaching process.[2] The programme strives to be faultless and it is accepted that 'if any one element of instruction is not done well, high-quality instruction in other areas may not compensate for it'.[3]

CMC provides resources for the teacher and pupils which have been designed so all aspects of the teaching process have been catered for.[4] These aspects consist of three main components of DI which allow all children to learn effectively and efficiently:[5]

1. Programme design
2. Organisation of instruction
3. Student-teacher interaction techniques

There are many great books and papers that eloquently discuss DI; this is a brief summary of one of the three components of DI – programme design – and its five elements.

1) Analysing the content matter

DI's goal 'is to teach generalised skills'.[6] For this to be possible, the concepts, rules and teaching strategies must be identified.

For example, a concept identified and taught in the Level D programme is how to state a fraction from a diagram where one or more shapes are split into an equal number of parts. This concept will provide a strategy to be able to state a fraction from a number line. The concept has been taught in both forms so pupils can gain a generalised strategy to apply to the widest possible range of examples. This strategy will allow pupils to express a mixed number on a number line or show that two fractions are equivalent using a diagram, or be able to add fractions with common denominators which sum to 1.

Identifying the content matter of a concept is the first step of programme design.

2) Clear communication

Given that the content matter has been identified, the second aspect of programme design is clear communication. This means creating an instructional

sequence that empowers pupils to apply a generalised strategy in a wide range of examples.[7] One part of this is called 'general case programming', where instruction is designed to communicate one and only one meaning, for all situations.[8]

For example, the Level D programme communicates how to state a fraction from a diagram like this:

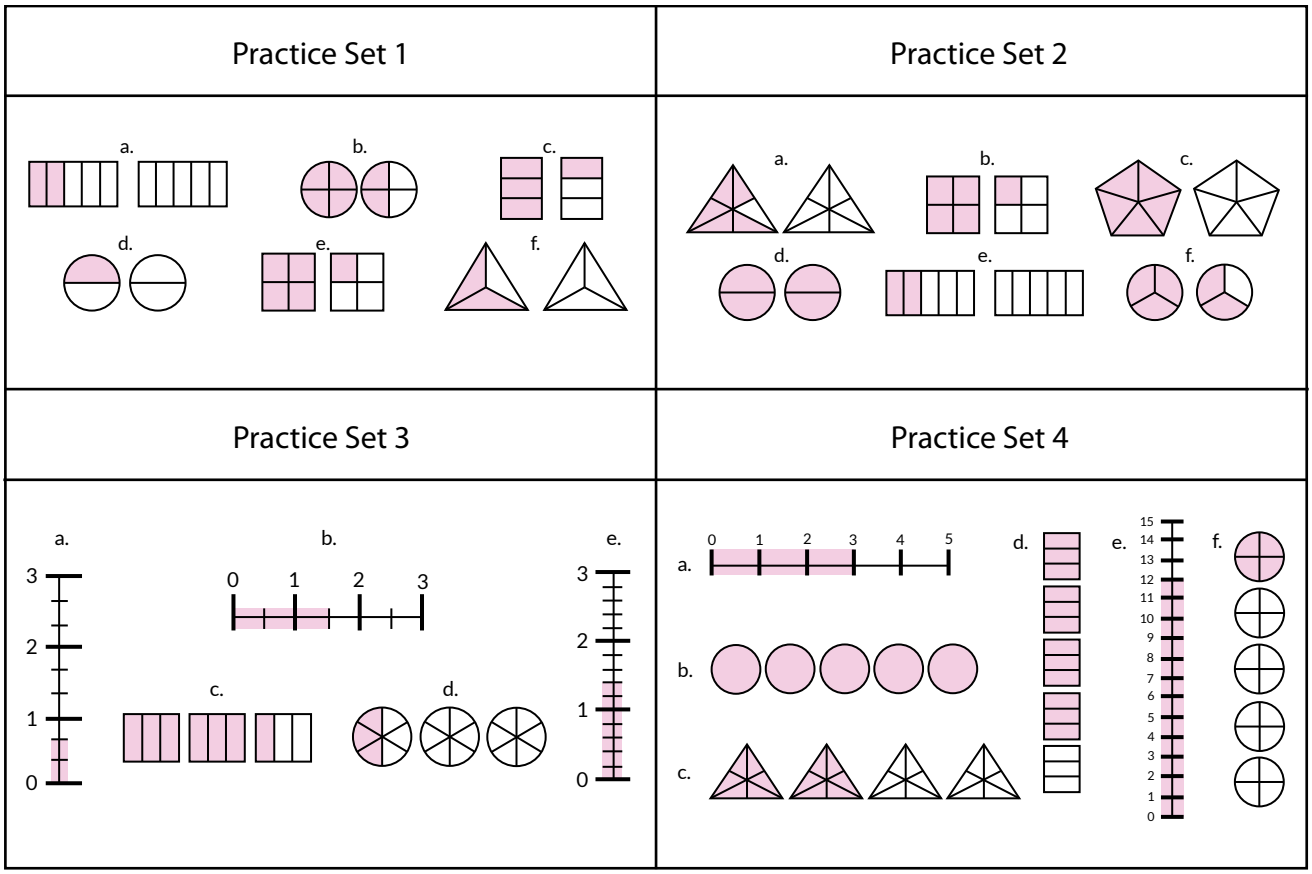
The top number is the total number of shaded pieces. The bottom number is the total number of pieces in one unit.

This instruction didn't change at any point throughout the textbook when they were learning this skill, or a future skill which required pupils to state a fraction from a diagram. More importantly, this strategy works for all problem types: a proper fraction, an improper fraction, or a fraction which simplifies to 1.

This is the same language which is used when stating a fraction from a number line. The instruction deliberately uses the language 'top' and 'bottom' rather than 'numerator' and 'denominator' because it is learner-friendly instruction. The same wording is used throughout. [9]

3) Instructional formats

Next, instructional formats are created, based on the concepts, rules and strategies to be taught, and clear communication used to teach pupils a generalisable strategy. Format refers to the way a teacher presents each question or explanation. The scripted teacher presentation book is very helpful in providing each explanation for a concept which allows them to use 'effective, well-designed and precise language to communicate clearly with all students'.[10] In terms of the questions, the initial format of a set of questions will be structured to support pupils but then the format changes so pupils can apply their understanding independently.



Practice exercises from Level D CMC textbook series[11]

CMC provides resources for the teacher and pupils which have been designed so all aspects of the teaching process have been catered for. These aspects consist of three main components of DI which allow all children to learn effectively and efficiently.

For example, here is the transition between a sequence of exercises over four lessons where pupils learn how to state a fraction from a diagram.

The format of the exercise has changed. The first set is focused on the use of a shape. The second set includes questions where the fraction can simplify to an integer. The third set is a mixture of number lines and diagrams. The fourth set is a mixture of diagrams and number lines where there is only one part between each integer.

The initial support is vitally important because it ensures a high level of success and then with each exercise the process of 'fading' the format comes into play: the format goes from 'highly supportive to highly independent'.[12]

4) Sequence of skills

The sequence in which skills are taught can dictate how successful the learning process is because skills are then practised continuously.[13] Eventually, the sequence also allows pupils to apply a generalisable strategy to deal with exceptional situations too. For example, the skill of stating a fraction from a diagram is covered in 40 consecutive lessons in one form or another, ensuring a skill learnt in one lesson is used in subsequent lessons. The continual review of one skill allows pupils to develop automaticity, and so 're-teaching' is unnecessary.[14] The alternative is teaching a skill which isn't reviewed in the future, which means a pupil's understanding of that skill deteriorates and re-teaching is required.[15]

5) Track organisation

A track is an organisational framework where one skill is developed over multiple lessons. For each skill practised there is a track, and this means that in one lesson about 4–5 skills are included, instead of a narrow focus on a single new learning objective occupying the entire lesson.[16]

This way DI 'can extend the teaching and practice of a skill across many lessons and weave prerequisite skill tracks into the tracks that integrate these skills into more complex strategies'.[17] Each skill is developed with only one small change at a time to avoid pupils becoming overwhelmed with a large quantity of new information.[18] This allows pupils to learn new concepts effectively and efficiently.

CMC is an extraordinary resource which has helped pupils learn more in less time. CMC demonstrates that 'higher-order thinking depends on the mastery of more basic skills and involves the integration of concepts, rules and strategies'.[19] The beliefs that DI does not achieve this are most often due to a misunderstanding of what DI is.

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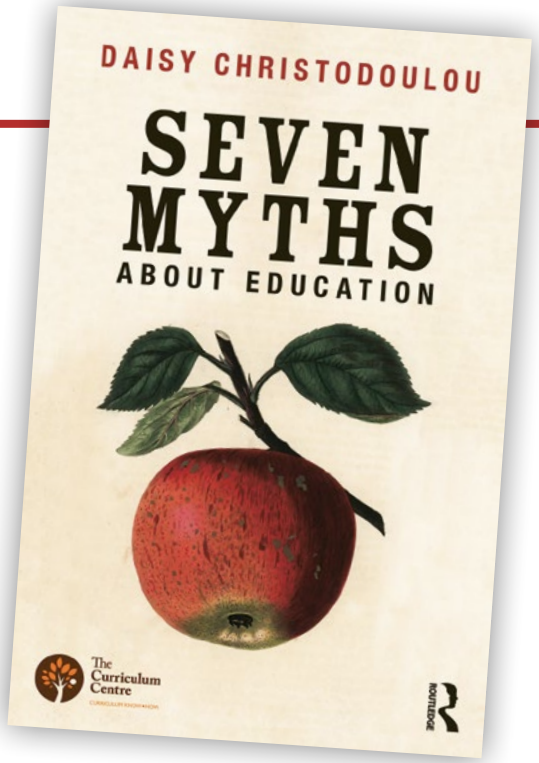
A BOOK THAT CHANGED MY TEACHING

THIS ISSUE: COVER STAR DAISY CHRISTODOULOU'S *SEVEN MYTHS OF EDUCATION*

James Theobald

When I first read Daisy Christodoulou's *Seven Myths About Education* in 2013, my first thought was: 'This is brilliant, but I don't know how to share it at my school – it seems too controversial.' Reading it again now, it's hard to imagine this, as many of the seeds planted from this book have not only taken root, but have produced rich harvests in schools all over – including my own – in the five years that have passed since its first publication. But in 2013, it was like reading a revolutionary pamphlet (not least because it was only available as a more-or-less self-published e-book at this point).

But whilst it may have felt incendiary at the time, the book itself is far from being simply an act of rhetoric. Its power lies in the measured way that Christodoulou collects and presents her arguments: this is the work of the diligent solicitor preparing a sound case, not that of the showy barrister summing up with wily legerdemain. The reason this book appealed to me as a teacher was that each myth is laid out systematically: initially with well-referenced documentation of its prevalence – much of which chimed with my own experience – and then the myth is promptly dismantled, using the author's vast amount of reading on each subject.



Reading the book led me to trace back through Christodoulou's references – much of which are from cognitive psychology – and read the papers and books for myself. There is much discussion about contemporary cognitive psychology in schools today, but nobody had

Seven Myths About Education lit the blue touch paper for the way that I approach teaching today. It changed things for me, and for my pupils.

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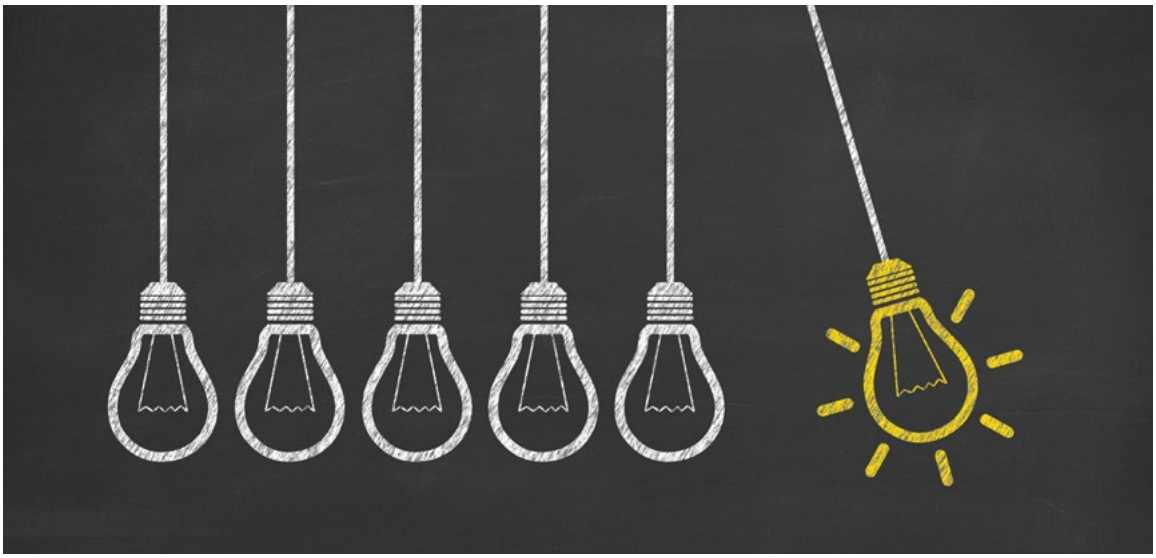


ever made any real reference to it in the time I had been teaching up until the point I first read *Seven Myths About Education*. As far as my initial teacher training was concerned, cognitive psychology was something that ended sometime in the 1930s, with Piaget and Vygostky.

So Christodoulou's book was a gateway to Daniel Willingham's *Why Don't Students Like School?* (2009) and Kirschner, Sweller and Clark's seminal paper 'Why minimal guidance during instruction does not work' (2006), amongst others. I've lost count of the number of times I've seen and heard these works referenced by educators today.

But *Seven Myths About Education*, whilst standing on the shoulders of giants, stands as the singular work that lit the blue touch paper for the way that I approach teaching today. It changed things for me, and for my pupils.

Reading through the chapters for the first time, I could relate much of what was being said back to my own classroom (this may seem obvious of a book on education, but you'd be surprised at how many writers manage to miss this mark). Some of the things written immediately rang true, whereas others challenged my own close-held beliefs at the time. I can remember reading the first chapter on the myth that 'facts prevent understanding' and, as I read, piecing it together with my own experience in the classroom: what did those pupils who possessed the 'skills' of enquiry, evaluation and creativity, etc. have in common? It was like a lightbulb going on. The pupils that understood new ideas more immediately were doing so because they already had knowledge and they were drawing on this knowledge to help them understand the new ideas. The pupils that were creative, or were analytical, were working from a strong base of knowledge. I now approach my classroom with the initial aim of building fluent and flexible knowledge in my pupils before we develop skills around this knowledge. What's more pleasing is that this approach is not particularly controversial today. I think *Seven Myths About Education* can take some credit for that.

Other myths in the book were difficult for me to swallow at the time, specifically those around education technology. The chapters on the ideas that 'the twenty-first century fundamentally changes everything' (myth 3) and that 'you can always just look it up' (myth 4) both contained sacred cows to me. At the time I read this, I had spent the past few years going back to my own initial teacher training course to run sessions for trainees on the use of edtech in the classroom. I had advocated pupils using technology to research topics themselves and had been in the thrall of some of the claims about technological change made in the popular YouTube video *Shift Happens*. In *Seven Myths About Education*, Christodoulou sacrificed those cows right in front of my eyes.

I think that perhaps the greatest impact the book had on my approach to teaching was in making me think critically about how and what I teach. As Christodoulou writes when disposing with the myth on the 21st-century movement: 'Nothing dates so fast as the cutting edge.' In education, teachers are constantly placed in front of a conveyor belt of ideas, like contestants on *The Generation Game* trying to pick up as many of the best prizes that we can. Some of these ideas are new and some have been around for a while, but as we tend to be drawn to shiny new things and we like to feel that we are at the forefront of something, it is the novel that is often valorised. That, as Christodoulou writes, is the conclusion of the 21st-century movement. But the author's own conclusion is the one that has stuck with me: 'The newer the idea, the more sceptical we should be about teaching it in school, and the older the idea, the more likely it has stood the test of time.' Of course, this doesn't mean that I write off new ideas; rather that I take time to investigate any claims made of them, I try to evaluate them properly and am certain not to draw conclusions on them too hastily.

I cannot overstate the impact that *Seven Myths About Education* has had on my approach to teaching. It may not really have been a revolutionary pamphlet at the time I first read it, but it certainly feels like common sense to me now.

FROM NEUROSCIENCE TO THE CLASSROOM

Efrat Furst

Can neuroscience add anything to our understanding of the classroom? And what should teachers make of it? Efrat Furst looks into how this lens might prove useful in the future.

What I'm most curious about is human learning. How does it take place in the brain and how does it take place in the classroom? From my point of view, shaped by my background in both cognitive neuroscience and teaching, they are equally interesting and greatly interrelated. These questions guide my everyday work in communicating (neuro)science and education. Educators and researchers often have similar questions about learning, but different ways to approach them, with different goals, ranging from pure theory to pure practice. I find it fascinating and valuable to look at these goals through both lenses, striving to understand both the 'Why' and the 'How', shaping both teaching practices and research.

From neuroscience

My background is in cognitive neuroscientific research on human long-term memory. I did my research in the Dudai Lab at the Weizmann Institute of Science in Israel. The lab studies memory using two approaches: neurobiological research, and human behavioural research combined with functional neuroimaging. This combination allowed me to study memory from both the biological and the cognitive points of view. While working on my research I was also active in science teaching, teaching topics in science and neuroscience in various programmes for students (grades 4–12). This experience triggered my interest in making connections between research and practice.

Looking back, it was my multidirectional view on the retrieval process, the process by which we access our memories, which turned this plan into a reality. The neurobiological branch of the lab was working for years on the dynamics of memory processes: establishing that consolidation, the post-learning biological modifications of neurons and synapses, is necessary for long-term memory and future retrieval.

Intriguingly, in the early 2000s the lab was among a group of labs that demonstrated that the consolidation processes is not a one-time event: when well-consolidated memories are reactivated during retrieval, they become malleable and subject to reconsolidation. These findings have led to an updated view of memory consolidation:[1] it is not just the initial learning experience that registers the information, but also every subsequent activation by retrieval of the memory bears an opportunity to modify the memory trace. The idea that when we try to retrieve memories we update and strengthen their trace emphasises the importance of retrieval – it's not just the end result of learning and remembering, but actually a vital phase in the process of modifying and strengthening memories in the brain.

With this background, in 2008 I came across a fascinating article in *Science* journal by cognitive psychologists Jeffrey Karpicke and Henry Roediger.[2] They studied the contribution of retrieval practice, as a method of learning, to long-term performance. They demonstrated that by trying to recall the meaning of words in a foreign language, participants dramatically improved their recall ability after a week (when compared to learning by rote memorisation). These important findings made a lot of sense: the neurobiological basis of retrieval seemed like a plausible explanation for the cognitive-behavioural findings. On top of that, I realised the immense practical potential of these findings. This was a turning point in

my career, when neuroscience, cognitive science and education came together.

To the classroom

Upon graduation I decided to pursue the field of education. I studied for a teacher certificate in biology, and also started teaching in schools (curricular science and non-curricular neuroscience). This was obviously an intensive and challenging experience: learning pedagogy in theory and by practice, learning from my students and from experienced teachers. This new knowledge was built upon my established expertise and views on human learning and memory, igniting my motivation to connect them.

In a process of several years I was designing research-based, classroom-oriented curriculum for students and teachers. I was teaching students in secondary and post-secondary education, teachers and lecturers, getting feedback and adjusting accordingly. Thankfully, teachers and students have found these topics to be interesting, counterintuitive and applicable for their practice. I was frequently asked, 'How come we have never learned this before?' With growing certainty about my professional path, and motivated by the increasing demand, I kept working on filling this welcoming void.

I teach education professionals – across levels and fields – a unique programme that integrates three layers: the basic neuroscience of learning as basis, then cognitive research-based effective learning and practice strategies as core, and classroom application as goal. In a related avenue, I guide research projects performed by students and teachers to experiment with ideas from cognitive science to promote self-reflection and motivation to adapt practice.

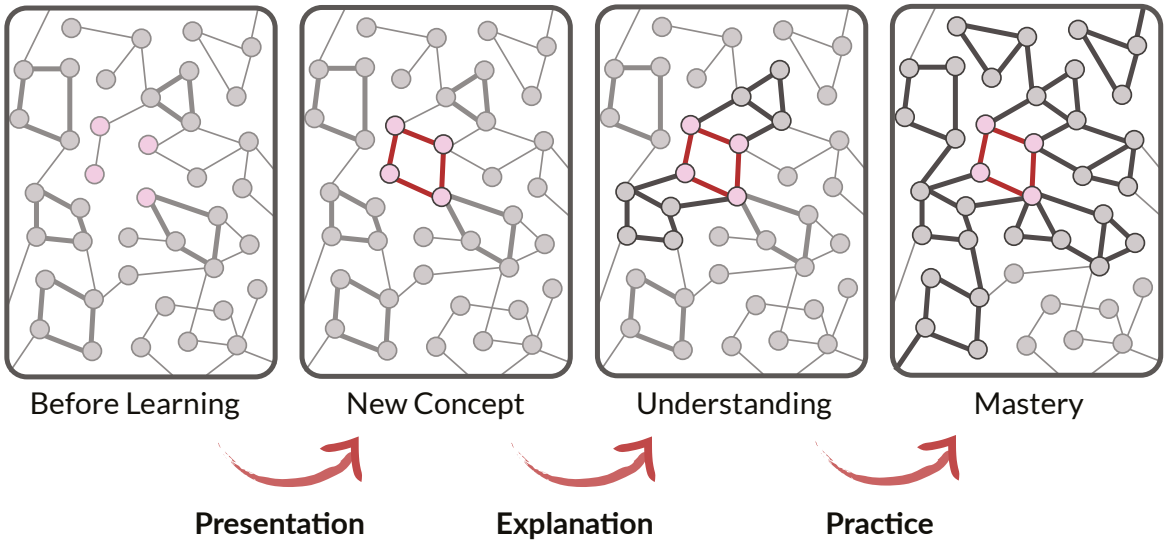
After several exciting years of intensive work in Israel, our family adventures took us to Boston. This was an opportunity to evaluate my work so far, and to discover what is done in this field in the world. About one year ago I discovered the inspiring edu-Twitter and **researchED** communities. It was thrilling to discover a range of professionals with shared goals, and multiple avenues of insightful thought and impactful applications. Being part of the lively community of **researchED** called me to better define my professional identity as a communicator between (neuro)science and education, and to share some personal takeaways from this work so far.

Neuroscience in education

There is a current debate whether neuroscience can practically contribute to the field of education. A common claim is that neuroscience cannot contribute anything beyond cognitive and behavioural findings. While I agree that most of the current research is not immediately applicable to the classroom, I have found that some aspects have clear added value when combined with findings from cognitive sciences.

Core direction is to teach the essence of how a learning experience is potentially turned into memory – how new information is constructed in the brain on the basis of prior knowledge, and how effective practice should lead to creating well-established schema structures in the learner's mind. Importantly, the use of visualisations supports clearer and more concrete understanding. A principal example of such a visualisation depicts a simplified model, on the basis of current theories, of how learned information is stored in long-term memory. In the model neurons (nodes) and synapses (connectors) create neuronal representations of learned information; they are formed after learning, stored, and potentially reactivated upon retrieval.

Model of memory representation in long-term memory store



This model has several valuable properties: it creates a concrete way to explain the learning process and its outcomes. It also emphasises how the basic principles of learning and memory are common among all learners. Additionally, it allows us to separately discuss the initial learning phases ('presentation' and 'explanation' in the figure) and the 'practice' phase. Specifically, in the initial learning the focus is on forming long-term representations by creating meaningful associations, explaining a newly learned concept in already familiar terms or with familiar examples. Examples of relevant applications are using deliberate elaboration, concrete examples and preventing overloading the limited working memory resources. Then, in the practice phase, the focus shifts to establishing the representations and making sure they are usable and accessible by building and maintaining retrieval pathways. This is when effective practice approaches (like distributed retrieval practice) are discussed.

I use a similar framework to further explain the consolidation and reconsolidation processes and their possible contribution to the benefits of retrieval practice and distributed practice. Presumably, when trying to retrieve, we are activating and reconstructing interconnected networks and pathways in attempt to find the relevant piece of information, in comparison to mere rehearsal of already-presented information. The mechanistic point of view of the brain asserts that whatever was active and connected meaningfully during the practice session has chances to undergo reconsolidation.

Between research and classroom practice

Many teachers find these ideas relevant, important and applicable. Some immediately see the relations to practices that they regularly use, and the research-based point of view helps them identify the critical points, refine and develop them further. For others, this perspective is an effective trigger for update and transformation.

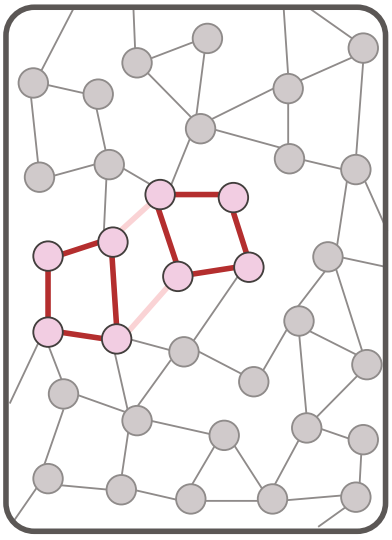
And yet the process of shifting form understanding to implementation raises challenges. I learned that dealing directly with these challenges and the ways to overcome them is essential and equally important to communicating the science. Teachers face their students' challenges as well as their own.

For once, the effective learning strategies cannot be 'taught'; they must be practised. When we are telling students how they should learn, we are probably only helping the minority of students who already use the strategies or are inclined to. However, most students, even when informed, would not voluntarily choose effective strategies. Because while these strategies are rationally better, emotionally they are neither intuitive nor compelling. Retrieval practice, for one example, requires significant effort, it does not provide immediate reward and the benefit is evident only in the long term. The opposite is true for restudying or cramming, which is easy, rewarding and effective in the short term. Since it is in our nature to act upon immediate rewards, it is unrealistic to expect that students would choose the seemingly unrewarding options. Therefore, it is not enough to tell

Proposed model for neuronal activation patterns for two practice strategies:

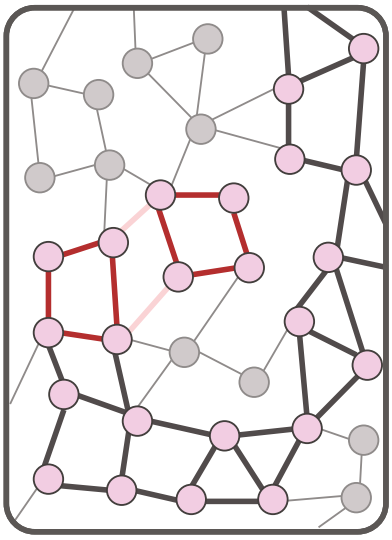
ReStudy

Rehearsal of a concept when presented or read



Retrieval

An attempt to locate the concept in the mind



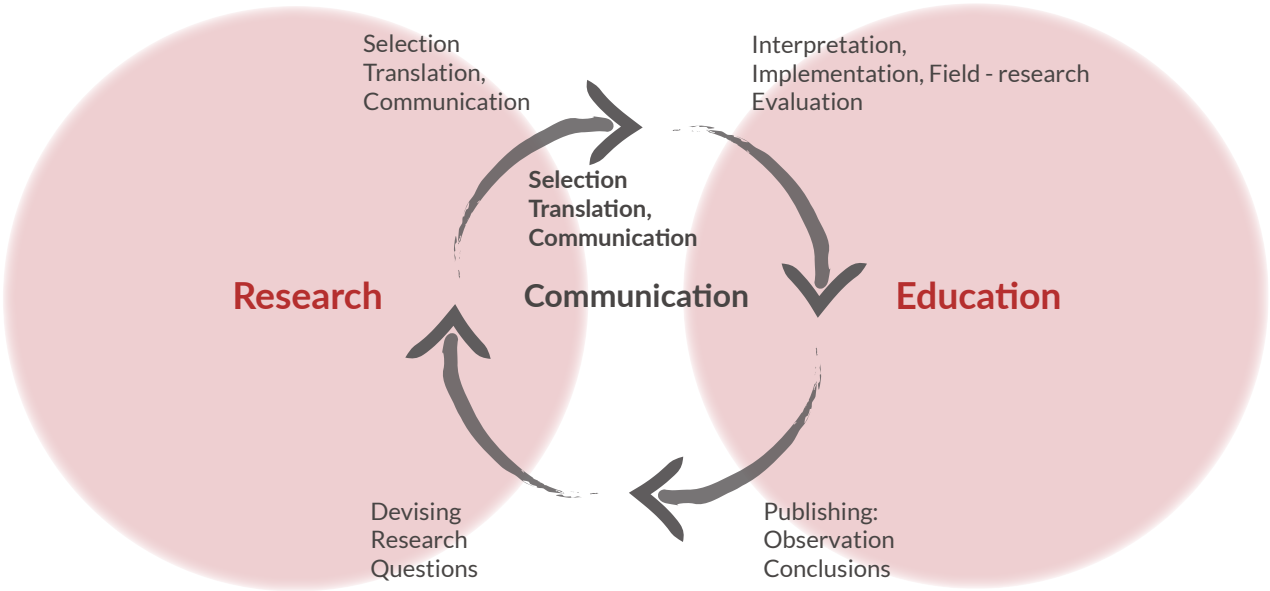
students how to study, even if we explain why. As teachers, we should build routines in the classroom that closely support the students in applying effective strategies.

However, helping students to overcome their challenges is by itself challenging – and for similar reasons. Pedagogical transformation for the sake of long-term goals requires significant effort without immediate rewards. Moreover, teachers must face students, parents and the system they work in – all of which may demand immediate results. Many teachers, myself included, testify that even though they understand why they should change their practice, it is still not trivial: our reward system is working against us, and at times so are the 'systems' we work in. Like with students, these practices come naturally to some, but not to most, and a systematic acknowledgement and support in the process are crucial.

Working in the realm between research and education teaches me that there is much more to it than translating research findings into classroom practice. It has several phases, and each requires deliberate efforts as well as resources.

The ways the information is selected, planned and taught immensely influence the way it is accepted and the motivation it triggers. The attitude and personal relationships are crucial too – just like any other teaching practice! As mentioned above, the implementation takes great effort and requires systematic and continuous support to allow multi-level implementation processes that include discussions, experimentation, allowing time and resources for evaluation of the process, and publishing conclusions in a scientific (but mostly idiosyncratic) manner (e.g. blogs and opinions). On this basis, practice-originated and -oriented research questions could be raised to further feed the communication cycle.

Discovering **researchED** was a dramatic revelation: the realm I was visioning and working toward actually existed! I am excited to learn about the various realisations of these ideas through the work of organisations, schools, and – importantly – individual teachers and scientists. This experience has caused me to learn, reflect on and better define my work, and has motivated to me to aim even higher. My goal is to continue to actively develop and invest in all phases of the communication process, through learning, teaching, implementation, field research, and engaging in bi-directional communication. It is inspiring and empowering to do so as part of an international community that is devoted to learning and teaching.



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researchED's mission is to raise research literacy in the teaching profession and the education sector more generally. We do this because we believe that teaching will be improved the more it engages with evidence bases that are as substantial as possible. It is no longer acceptable for education to be governed by instinct or intuition alone. Where there is evidence- in its many forms- we should reflect upon it. Where there is research, we should face its conclusions. There must be a dialogue between the craft of teaching practice, and the evidence bases that inform it. The space where these two spheres interact is where **researchED** operates.

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researchED welcomes submissions from all people regardless of ethnicity, sexuality, or gender. We particularly welcome submissions from under-represented peoples or groups, considering all such submissions equally. In order to redress historical and cultural misrepresentation, we would urge anyone reading this to encourage any members of underrepresented groups who wish to, to send us a session submission. It would help us to improve representation, (and on a personal note I would welcome the expansion of my networks for future conferences). And we will always endeavour to increase our efforts to improve representation as we grow.

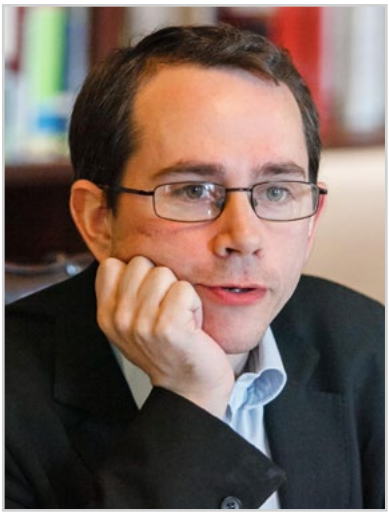
We ask that all speakers be prepared to discuss their evidence bases with their audiences if asked to do so. How do you know what you claim? Obviously the definition of evidence bases will vary from session to session, but we do not solicit sessions that represent the speaker's opinion alone without sufficient substantiation.

All submissions are considered by the conference lead for suitability, how they fit into the shape and content of the day, how they overlap with other sessions, and how they serve the aims described above. The conference lead will confer with the director of **researchED** Tom Bennett and a decision will be made and communicated to the applicant as soon as possible. Please be aware that **researchED** has no capital or employees, only volunteers. As such we may take some time to reply. If this is the case feel free to email us to remind us. Acceptance to present at **researchED** is at our discretion.

Thank you for considering a submission to **researchED** and we look forward to hearing from you!

– Tom Bennett

HOW TO USE EVIDENCE TO MAKE DECISIONS



Sam Freedman

Policy-makers are often criticised for making decisions based on ideology rather than evidence. Here, Sam Freedman, who worked for years in the UK Department for Education, talks about ways it can be done.

Education is a social science. It will never give us the kind of proofs that are possible in physics or maths. On almost any given pedagogical controversy, you'll be able to find at least one impressive-looking study to back up your prejudices. How then can a teacher, leader or policy-maker make decisions 'on the basis of evidence' when the evidence is so murky? There are those that argue the quest for 'evidence-based education' is entirely quixotic and we should focus instead on trusting the wisdom of experienced professionals.

This feels like a council of despair but it is a real problem, and it does worry me when well-intentioned practitioners base crucial decisions on a glance at a simple summary of the Education Endowment Foundation (EEF) or John Hattie meta-analyses.

The dangers of this approach were illustrated a few years ago when the EEF toolkit was originally published and the entry on teaching assistants indicated they had no impact. This was picked up by various newspapers – no surprise, given that more than £4 billion a year is spent on teaching assistants. The EEF was forced to put out a clarifying statement explaining that, while research suggests that, on average, teaching assistants do not have a positive effect on attainment, other studies showed that, if deployed in certain ways, teaching assistants can have a very significant impact.

And this is true of most of the other interventions in the toolkit – the averages hide huge variance that will depend on the exact structure of the intervention and, crucially, the context in which it is deployed. For instance, on 'social and emotional learning' the toolkit gives a positive rating overall; but an evaluation of the national social and emotional aspects of learning (SEAL) programme – which was poorly implemented in many schools – found no impact on attainment.

So how should we weigh up evidence when making decisions if it's often contradictory and nearly always context-dependent? My starting point is to think of every question as a balance of probabilities rather than something with a right answer. Every piece of data then nudges the balance one way or the other; the better and more relevant the study, the bigger the nudge. Let's say I want to know if I should introduce a uniform policy to my school. If a gold-standard randomised control trial (including schools like mine) published in my country shows that having a uniform makes a positive difference, that's going to change the balance significantly. A small qualitative study from a developing country won't push it far at all.

This way of thinking allows you to add your own experience and the qualitative feedback of colleagues into the mix. If the balance is fairly even, either because evidence of similar quality and context is contradictory or, more usually, because there just isn't very much of it, then your own experiences can make the decisive nudge. The uniform example is a good one here. There isn't much evidence to suggest it makes a difference or does any harm – so if in your school you feel it's valuable, that's

enough to make the call. If there was strong evidence of harm, however, then that shouldn't be outweighed by your own positive experience.

As a general heuristic, this is a useful model; but there's still the problem of how to gather information. Teachers, and policy-makers have full-time jobs – how can they accurately calibrate the balance of probabilities without spending all their meagre spare time reading research? Given their lack of time, there's no real choice but to start with meta-analyses like the EEF toolkit and Hattie.

But simply relying on summaries won't give anything like the necessary nuance, so it's vital to pick them apart and look at the collection of underlying studies. Often the first layer under the summary is another set of issue-specific meta-analyses which have very helpful overviews of the existing evidence in their introductions. They should also help to identify which are the gold-standard evaluations in that area – which should have extra weight in your decision-making – as well as the context for the key studies. Typically, most of the best research comes from the US, so often there is a trade-off to be made between quality and context. Once you've done an initial review then it's relatively easy to stay up to date by following a few key accounts on Twitter (my public 'education' list is a good starting place).

Perhaps the greatest challenge in doing this type of analysis is managing your own cognitive and political biases. If the evidence is genuinely unclear then using your own beliefs and experiences is the best available option. But if you rig the underlying analysis by favouring studies that support your existing opinion while finding reasons to dismiss those that don't, then you'll calibrate wrong in the first place. This tendency is apparent in all education debates – the recent one on grammar schools being an obvious example. Supporters, many of whom benefited from a grammar school education themselves, latch on to the evidence that selectively educated pupils do well, while ignoring the research showing that the system as a whole suffers.

It's impossible to eliminate this instinct but we can at least become self-aware enough for the problem to weaken its hold over us. I would recommend everyone involved in education read Daniel Kahneman's *Thinking, Fast and Slow*, which explains how we're affected by cognitive biases, and Jonathan Haidt's *The Righteous Mind*, which does the same for political/cultural biases. Philip Tetlock's *Superforecasting*, which looks at how the best predictors of the future eliminate biases, is also worth a look.

To make the best use of evidence, decision-makers need to think of it as a way to calibrate the balance of probabilities that requires regular readjustment, rather than simply a way to identify whether something is right or wrong. They need to use meta-analyses and social media to be reasonably on top of the available data. And they need to do as much as possible to remove their irrational biases. Research will never give us the perfect answers; but if used right, it's a hell of a lot more valuable than gut instinct and prejudice.

researchED SPEAKS TO...

THE RT HON NICK GIBB MP, MINISTER OF STATE FOR SCHOOL STANDARDS

Nick Gibb was appointed Minister of State at the Department for Education on 15 July 2014. In 1997 he was elected Conservative MP for Bognor Regis and Littlehampton. He went to school in Maidstone, Leeds and Wakefield before going on to study law at Durham University, and was formerly a chartered accountant specialising in corporate taxation with KPMG. He served as Shadow Minister for Schools from 2005 until 2010, and as Minister of State for Schools from May 2010 until September 2012.

Here, he talks to **researchED** founder Tom Bennett about his own education, his journey through policy, and why he believes that better evidence usage is essential to raising education standards and improving life chances for children.

TB: *What was school like for you?*

NG: I had a very interesting school career. I went to a state school in Acton in 1965 just as the Labour government's reforms of schools – like the abolition of grammar schools – took place, and after two years I moved to Canada (which in hindsight, had higher expectations all around) where I was accelerated. Then we came back two years later to Northamptonshire. The teacher said to my parents, 'He should be sent to an independent school,' and in those days, they were grant aided and my parents could just about manage to pay my fees, so I went.

My father was a civil engineer and so we moved to Maidstone. It was really tough. Really tough for me. Very rigorous academically and I had to catch up a year. So, I was copying out of kids' exercise books.

And then we moved house again – to Yorkshire. It had been a grammar school and it had just gone comprehensive. The education I got was a grammar school education, but in a comprehensive setting. Then after O levels, 1976, we moved again to a village outside Wakefield, where I went to a very weak comprehensive school sixth form, but did well because of my education to date.

TB: *Did exposure to that variety of schooling teach you anything?*

NG: During that period you can see I was at school when all those changes were happening. What I also learned was – especially when I went to a sixth form – what a bad school was like from the inside. The ethos, the lethargy amongst the students, like a malaise, that I'd never really seen before.

TB: *What from your own experiences of primary/secondary school stuck with you as a lesson which has continued into your educational philosophy today?*

NG: The key thing I learned was that mixed-ability teaching doesn't work. And secondly that the progressive – even as a kid, I could see it – ideology was damaging children's education. And I remember a lesson about geography. It gave you this blank, made-up map of an island; it had a few mountain ranges on it, and a river, and you had to say where on it the capital should be. I hadn't got a clue where the capital should be. I thought, 'Maybe they want me to say, "It's near the river."' Why not near the coast? Or the mountains? And it struck me that that was an absurd lesson. And then another lesson, in an independent school, where they gave you a bunch of wires, some batteries and some bulbs, put it in a box – complete mess of a thing. 'Make it work.' And I was furious.

TB: *Why?*

NG: I said, 'Make what work?' So I just switched off. I thought, 'This is an absurd waste of time. Don't bore me.' And it put me off, actually the whole notion of science. Guessing. Teach me! Tell me, and I'll do it. So it occurred to me then, and subsequently looking back at these episodes, there were some absurd notions in education that didn't fit in with the way that I knew I wanted to learn things. And I don't think I was particularly unusual.

TB: *Tell us more about your own journey towards evidence in education as an MP and a minister.*

NG: Well, I knew there was a progressive ideology. I remember in opposition going to see Charles Clarke as education secretary, and saying, 'You need to deal with this progressive ideology because it's damaging.' And he said, 'Well what do you mean precisely?' So then I joined the education select committee in 2003. I became a minister in 1997 and visited some schools on my patch. They said that a third of their kids were starting school with a reading age below their chronological age. I didn't know why this was. My mother was a teacher and I knew the reading age of most of her kids were above their chronological age. And then I went to some primary schools and I said, 'How often do you get children to read?' and they said once a week. My mother read with every child in her class of 40 every day.

Then I joined the select committee and was introduced to phonics, the Reading Reform Foundation and the academics like Jennifer Chew, Ruth Miskin. I read the Clackmannanshire study and realised it was quite compelling, so whenever I went on visits as a committee I asked about reading and realised that there was a big issue here, about synthetic phonics – that 'Look and Say' was 'progressive' and phonics was the thing that I knew worked.

And so I got the committee to do a review into reading, and it led to the national curriculum, it led to the Rose review, which then meant there were changes in the curriculum as a consequence. It was seen as a big victory about what you can achieve in opposition. The lesson for me as a policy maker is that you have to get into that nitty gritty detail sometimes about what happens on the ground in the policy. It's not always a high-level thing. You really need to understand that.

The key thing I learned was that mixed-ability teaching doesn't work. And secondly that the progressive ideology was damaging children's education.

So then I went on holiday and my researcher persuaded me to read the E.D. Hirsch book *The Schools We Need: And Why We Don't Have Them*. I read this over the summer in South Carolina, on the beach. I was completely taken away by this book. It encapsulated everything I had been worrying about but couldn't articulate. I had underlined bits of it, and I emailed E.D. Hirsch. When I came back I knew this was not just the knowledge-based curriculum, but also about where the ideology that I'd been worrying about since school had come from: the John Dewey, Teachers College Columbia, Rousseau-based ideology that had led to some of these absurd notions – learning by self-discovery, the science with the wires. So I made everyone read it: in opposition, people I met – sales must have gone through the roof! And I came to where I am now. I made Michael Gove read it.

TB: *It must be hard to get a detailed understanding of the brief when roles change so often.*

NG: Yes, the Conservative party at the time was – and to an extent still is – interested in the structural approach to education. It was unfashionable to be interested in this agenda: what should an A level comprise, what should a curriculum look like, what about pedagogy and things? Those were regarded as 'not matters for politicians'.

TB: *The secret garden.*

NG: They're the secret garden. They will be driven by the structural things. Structural changes, competition within the teaching sector will drive those changes because they'll be so keen to get pupils into their schools that they'll have to do the things that the parents want to drive up standards. I didn't accept that because I was in favour of the structural things but you had to do more to break up the cement of the ways things had been done since the 1960s. It would take policy initiatives to liberate teachers to enable them to do what they want, to respond to the demands of parents. Because at the moment this approach to teaching was so compressed, that no one teacher or school could possibly rail against it. And that always creates a tension because if you're saying 'We're going to have a DfE imposed

curriculum' then that kind of goes against autonomy and structural reforms. But in the end Michael basically charged me with leading the curriculum review and phonics.

TB: *Ah, so you were behind the revolution?*

NG: (Laughs) No, no, no! Absolutely not. The brains were clearly Michael Gove who went to Sweden to see the free school programme and that's what drove it. But wanting to address the ideology has been my driving force.

TB: *What are the advantages for a policy-maker of leaning on an evidence-informed reform, and what are the challenges?*

NG: Well the advantage is that you can be confident that what's implemented will lead to higher standards. That gives you the argument when you're trying to present a policy. But it also gives you the confidence to look long term. So, yes, it can go through controversy, but it doesn't matter because we know this will lead to higher standards of reading, we know this will lead to better maths in primary schools because you have all the evidence of Shanghai and elsewhere. So, we can withstand the slings and arrows that happen in the meantime because in X years we will be vindicated. Which is exactly what's happened with the reading. And we did take a lot of criticism when we introduced it, but it does give you that ballast to plough on. 58% passing going up to 81%, you can see.

For a policy-maker it is that confidence. People sometimes accuse me of simply making a policy based on my own life; but if you can explain your own experience with reference to the evidence, it then does give you that confidence to pursue policies and to get into the detail of policy that previously was regarded as idiosyncratic, or indeed an area where you shouldn't be going.

The other thing I did in 2003 when I joined the select committee was going on school visits, and I had a routine of going every Monday, somewhere. And being in opposition you could. And I realised you could get to anywhere in the UK by 11 if you left early. So I would arrange to visit schools all over England. And I learned a huge amount just by visiting schools and hearing the discussions. Then you realise things. There were a lot of non-academic subjects being taught in schools, and in some schools it was quite depressing. There were conscientious teachers running those schools, teachers who genuinely believed that doing these vocational qualifications was the best thing for these children, when it clearly wasn't.

TB: *I heard you had a test for visiting school libraries.*

NG: Yes, when I went to schools I had a Fielding test: did they have Henry Fielding, *Tom Jones* on their shelves? But really the Fielding test was just 'Have they got the classics?' Often, they have, but they're not read. But the fact that they're in the library means they can be read.

TB: *How can a policy-maker reconcile the direction that evidence sometimes takes us in, as opposed to manifesto and party pressure?*

NG: The only way it has conflicted was really this issue of the party being driven by this notion of autonomy, driven by structural reforms, the academies programme, and the Conservative party had felt that was sufficient. And all the centre-right think tanks around Westminster, that was all they were interested in: how do you create a structure that would drive up standards? And so to have policy saying 'Actually there's a better way to teach or to read, or there's a better approach to pedagogy like direct instruction rather than learning by self-discovery,' this jarred with Conservative party thinking at that time.

What was great about the PIRLS results last year, 2017, based on nine-year-olds' reading ability, taken in 2016, was that it was a vindication of all the stuff I'd been talking about for years about phonics. It was a vindication of everything

I'm pleased that more and more control over teacher training is happening at a school level. And the schools are driving what they want, from the university courses and students. And/or they are awarding QTS themselves.

that I'd been talking about. And that therefore gave me more credibility. You do need to be engaged with 'How is maths taught? How is history taught?' So it gave strength to my argument in that debate.

TB: *Why are some parts of the education sector still relatively reluctant to embrace things like phonics, or evidence bases in general?*

NG: It's difficult to know. It really is. I still go to schools and you see they haven't genuinely bought into this debate and they tend to be schools that are getting 70–75% of their children through the check. And then you look into their reception class and it's all a big play area, very little teaching going on. I think it's because they've been trained this way, ten, twenty, thirty years ago...

TB: *Can you describe some of the directions you might like to see ITT going in the future?*

NG: I'm quite critical of education faculties of universities; I'm on the record for being critical. I remain critical. I find it absurd that the whole debate about the knowledge-based curriculum has taken place on the websites, or has taken place at conferences like yours, **researchED**, or the Knowledge Network and you don't hear a bleat of this debate from those university campuses. And if you look at the reading lists, it's fairly hard to find Willingham or Hirsch. And there's something very atrophied and unintellectual about those faculties, and the debate is still not happening. It's happening elsewhere. And that should not be the case in our university sector. We have some great universities, but as Hirsch says it's something he worries about, the education faculties of great universities – what is actually going on in these places?

But what I'm pleased about is that more and more control over teacher training is happening at a school level. And the schools are driving what they want, from the university courses and students. And/or they are awarding QTS themselves.

But I want the universities to come on board. I'd like them to be a bit more pluralistic in terms of the approach they take to teacher training. I will keep trying.

TB: *What have been some of the least evidence-informed fads in education?*

NG: I just look at the national strategies and things that came in the maths curriculum – this notion of chunking of long division, and the grid method of multiplication. I showed these methods to the Shanghai Education Service – and they just laughed. They just thought this was absurd. Why would you develop new, written methods only done in this country, and despite centuries of mathematical development? I've never understood that. So that's a classic example. Same with reading. People say, 'Where's your evidence for phonics?' I say well there's the Clackmannanshire studies, the National Reading Panel in the US, there's loads of evidence. But you ask someone for the evidence for Look and Say, and there's no real evidence for these approaches, and they've been a disaster.

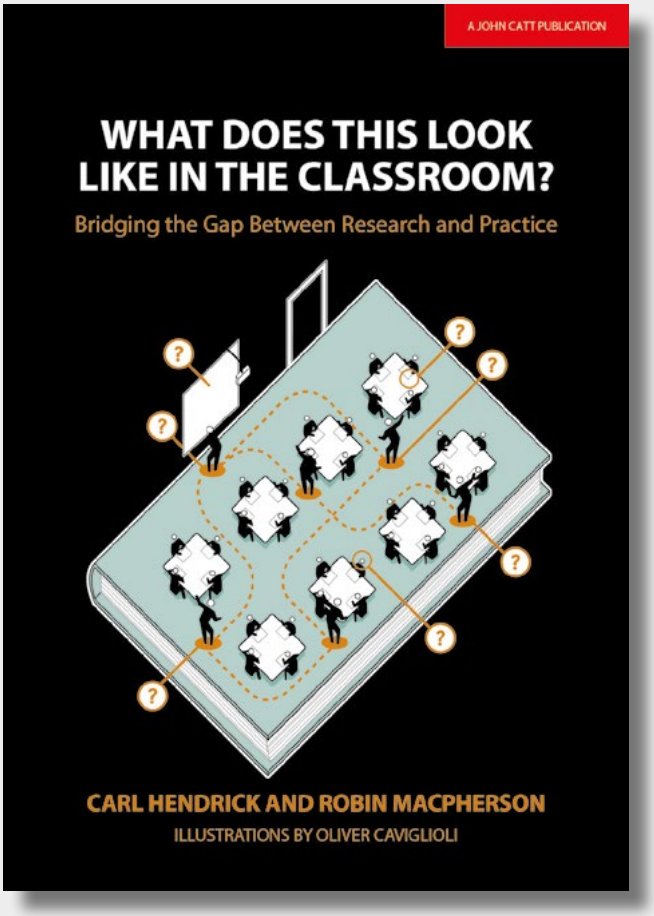
TB: *Who are the writers that you think other policy-makers should read in order to make sure that their decisions are evidence-informed?*

NG: Well obviously the canon is E.D. Hirsch and Daniel Willingham, *Why Don't Students Like School?* It's Daisy Christodoulou's *Seven Myths*, and I would also recommend Robert Peal's *Progressively Worse*. If people were to read those four books, they would have a much better understanding of education policy.

TB: *Has the OECD become too political in its pronouncements?*

NG: I think so. They are pushing a particular, progressive approach to education, the 21st-century competence-based curriculum. We tried this in this country with the 2007 curriculum, and what happened was that schools stopped teaching the quantum of knowledge they needed. So history was confined to the Tudors and the run up to WWII, because they were focusing on the so-called skills of a historian. I don't know how many people become historians out of our schools system. It's a tiny percentage. We don't need that many historians. What they do need and they're not getting, is the ability to read a history book, to read complicated language, and they need to have the deep knowledge of the complexities of those periods and other periods.

When you go to these international conferences with Andreas Schleicher and others, it's almost assumed that you want to have a competence-based curriculum; and I talk to other education ministers from around the world, including some from developing countries who have been advised by the OECD to go down this route that we know doesn't work. So we have to challenge it, and I've started challenging it internationally and I am a lone voice (laughs). But Nuno Cratto for example, who was the secretary of state for education in Portugal, absolutely agrees with what we're doing in this country and shares our concerns. And I think that gradually we'll get the message across that this is not the right approach.



WHAT DOES THIS LOOK LIKE IN THE CLASSROOM?

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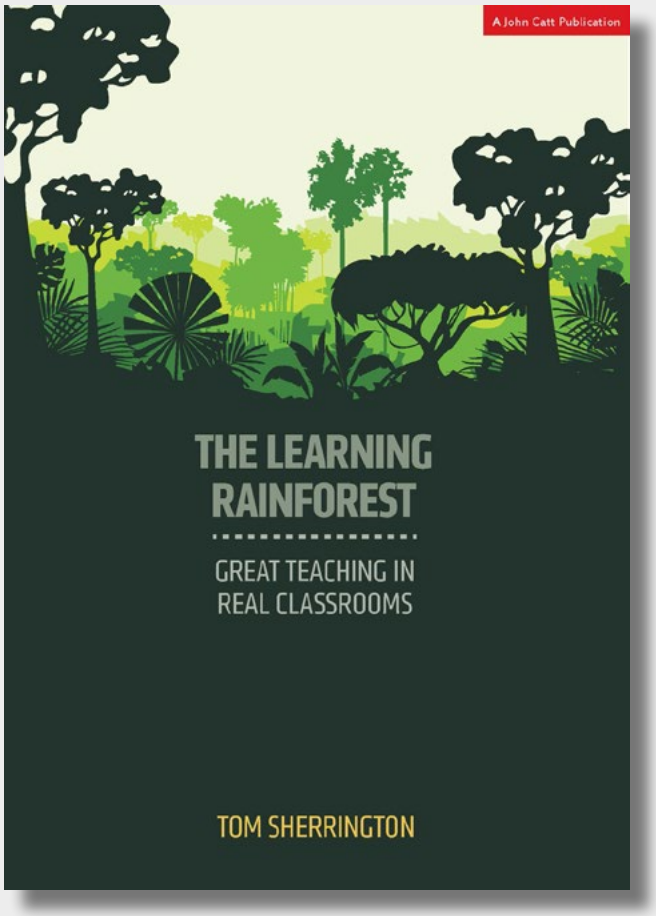

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TRUE CHANGE COMES FROM WITHIN

Eric Kalenze

Eric Kalenze, **researchED** ambassador to the US, writes about how quickly his understanding of evidence in education has changed, and how being part of a network was crucial to that growth

Do you remember the educator you used to be? Like, the one you were before you learned all you have from education research?

If you haven't done so in a while, I invite you to think back to the person you were so many research 'thresholds'[1] ago. Compare what you believed then about matters like effective learning conditions, kids' development, assessing students' progress, etc., to the things you think now.

Also, compare the practices you designed and carried out then to those of now. Do they look the same, or did you alter them over time to reflect the research insights you acquired?

And consider the support network you had when all those research-sparked epiphanies started popping: the people, in other words, you shared your new learning with, had your thinking pushed by, got clarifications from when necessary, and collaborated with on new practical actions. Were you surrounded by fellow travelers in your school/workplace, for instance, all of you similarly inspired by common sources? Or were you on your own to take in new concepts and accordingly re-design your instruction (and subsequently run online for necessary support, answers and echoes)?

I'm suggesting you consider these kinds of questions because the 'pre-research educator' has been on my mind a lot of late – first, because I've recently had the chance to get re-acquainted with my own pre-research self; and second, because that re-acquaintance has reminded me of how exciting it is to have an evidence-informed improvement movement like **researchED** gaining momentum in the US.

For with **researchED**, we finally have a way – through a network of fellow educator-learners, that is – to bridge the fads and snake-oil slicks out there and get the best instructional information straight to the people applying it every day. And let's face it: with so much of the field having been unaware for so long about what research *actually* says about kids' learning and the conditions that enable such learning, we've needed a better way for some time now. (As the late Jeanne Chall observed in her 2000 posthumously released classic *The Academic Achievement Challenge*, educators choose practices 'in a direction opposite from the existing research evidence'.[2])

Now let me back up a minute to explain how I came to be thinking about all this.

I've been able to spend some time with my own pre-research self via work I'm doing on my next book,[3] and it's been remarkably instructive. Through interviews with former colleagues, supervisors, and students, as well as through a review of various planning documents and classroom activities I'd created, I've been struck by a couple of revelations. First, the research I was studying at the time really did transform my instructional priorities, planning, and execution – and, of course, kids' results (!). In other words, this is not something that my imagination has overblown through the years and frozen into some ego-protecting amber. Next (and importantly to this piece), I was struck by how difficult it was, learning and designing largely by myself, to bring that research into practice.

The time period covered by my book-in-progress is 2004–2008, which means I was nowhere near Twitter (heck, it didn't exist until 2006), and a watershed cognitive-science-and-education title like Dan Willingham's *Why Don't Students Like School?* hadn't even been published. (However, I was familiar with Dan via his 'Ask the Cognitive Scientist' column in the professional journal of the American Federation of Teachers, *American Educator*.[4]) As my only real guides in the early 2000s were the references sections of the works I was reading, my research wasn't particularly time- or energy-efficient.

Also, self-study revealed to me that my research learning and application was a bit too *random*. Essentially, as I looked over my past work I could see that I was pretty much choosing research-guided solutions according to my classroom's most pressing needs. To put it another way: while I may have been doing something to build background knowledge here and tweaking my writing/conventions instruction there, I was really taking a 'band-aid' approach to applying research. While consistency and depth weren't helped by the various priorities of my department and school (at multiple points of my self-study I found myself wondering, 'What's this meaningless film unit doing in here? And why in hell did I take them to the computer lab for this thing?'), it remains what it is: as my pre-research self was growing into using research-informed practices, I was rather all over the place.

Still, looking back on it this many years out, it's clear to see which ideas from research were resonating with me enough to productively build around.[5] Getting there was a few-years-long process, though, and it was undoubtedly buoyed by my school-within-a-school (which, again, I joined in 2004) colleagues. Indeed: by the latter part of the 2004–2008 span that is the focus of my book, I could see my random practices deepening into actual classroom premiums – *philosophies*, even. And I'm not sure I'd have seen the same without such a network to affirm and push me.

I also gradually acquired the confidence necessary to challenge instructional truths many of my colleagues had long accepted as self-evident, thus widening my impact beyond my classroom. (Like I say, this experience was profound. If you are interested in learning more, see the book when it's ready!)

I could see my random practices deepening into actual classroom premiums. And I'm not sure I'd have seen the same without such a network to affirm and push me.

Though conducting this kind of *me*search wasn't ever my aim, doing so through my current book-work led me to consider a number of important things about building evidence-supported practices in education. Most of all, it reminded me that everyone starts somewhere, and that some help can go a long way to building focused, sensible instructional practices supported by evidence.

As **researchED** exists for educators to hold one another up through just these sorts of learning, design, and application efforts, I'm thrilled to be part of organising it here in the US (and, of course, taking part at other conferences and online). We've needed a better way for a long time, and I feel like with **researchED** it might actually be here. I can't wait to see how many education professionals' careers – and, by extension, kids' futures – benefit via the **researchED** learning network.

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3. By the way: the book revolves around a profound teaching/leadership experience I had while a classroom teacher (designing and teaching in a school-within-a-school for at-risk high-schoolers, that is). I'm aiming to have drafting complete by late spring or so and, if all goes well, a release in early 2019 on John Catt Educational.
4. I found in my self-search that I'd used Willingham's piece for AFT on teaching critical thinking in some staff PD I'd done in that period. See Willingham, D. T. (2007) 'Critical thinking: why is it so hard to teach?', *American Educator* 31 (2) pp. 8–19.
5. It's clear that Ravitch's *Left Back* (2001) and Egan's *Getting it Wrong from the Beginning* (2004) had helped me see where my teacher-training had come from, for example, so I'd started jettisoning some pieces I'd long considered obligatory. Also, based on adjustments I was making to my English instruction, I can see the effects of having read at least some E.D. Hirsch (in particular *The Schools We Need* (1999) and *The Knowledge Deficit* (2006)), Anne Cunningham and Keith Stanovich (their sample piece for *American Educator*, 'What Reading Does for the Mind' (1998)), and John McWhorter's *The Power of Babel* (2003) and *Word on the Street* (2007).

PSYCHOLOGY AND THE CLASSROOM

AVOIDING BOTH HYPE AND CYNICISM

Nick Rose

Teachers have long looked to psychology for theories and ideas which might inform classroom practice. However, where these fields of psychology are relatively new, they may not provide solid foundations for thinking about how we teach. On the other hand, cognitive science, especially the reliable findings from decades of research into learning, can make an important contribution to the professional learning of teachers – but it's certainly not a panacea for all the knotty problems that keep teachers awake at night, says Nick Rose.

As a secondary teacher in a comprehensive school, I would put together a little showcase of my subject for open evening each year (as I'm sure many readers have done). Along with offering an opportunity to discover more about some of the areas of psychology that pupils could study as part of GCSE or A level, I had a presentation of optical illusions, little activities like the Stroop Test, and a few potted bios of famous psychologists and their ideas. Younger children attending the event would enjoy these activities while I chatted to older students and their parents about the courses.

However, it was also common to attract a few teachers to the room – they would peruse the textbooks or look through the course – and sometimes say things along the lines of 'I wish I'd studied psychology; it's so interesting and relevant to teaching.'

Education has frequently looked to psychology for inspiration and insight – from William James and John Dewey in the 19th century, to Daniel Willingham and Carol Dweck in the 21th. As you'd expect in any science, ideas and theories about learning have changed over that time – though the ideas teachers are exposed to haven't always reflected the changes in evidence. In addition, academic psychologists are understandably keen to see their theories and findings applied, but many of the 'big ideas' that teachers might read about may not survive long in the crucible of science – undermined by failed replications – or are not terribly relevant to the complex environment of the classroom.

When David Didau and I sketched out the chapters for *What Every Teacher Needs to Know About Psychology*, we wanted to capture this fascination with psychology and explore where it might have useful implications for the classroom, but also highlight where teachers needed to exercise a bit of professional scepticism. Quite often, we argue, enthusiasm for a branch of psychology runs ahead of the evidence, or simply lacks tried-and-tested applications.

Are we a bit naïve about neuroscience?

For example, while there's a great deal of enthusiasm regarding neuroscience, bolstered by the advent of new technologies to examine processes within the living brain, I'd argue that the number of practical applications of neuroscience, directly useful to teaching, is approximately zero.

Jeffrey Bowers[1] argues that eagerness to apply neuroscience to education is misguided: while neuroscience can grant scientists insights into the *biology* of learning, a teacher cares about the learning *behaviour*

of their pupils. Whether learning involves activity in the hippocampus or pre-frontal cortex is basically irrelevant: it's simply the wrong level of description to apply to the complex social, behavioural and cognitive problems of teaching.

Some of the recent 'big ideas', he argues, represent fairly trivial findings for education. For example, neuroplasticity – which describes the lasting changes to the brain throughout an individual's life –provides the biological explanation for a phenomenon that teachers are already well aware of (i.e. that we have the ability to learn!).

Lastly, Bowers argues that important and useful findings about learning are often misappropriated as examples of neuroscience. For example, retrieval practice or the 'testing effect', which suggests testing of information often improves learning more than restudying, was recently included in an EEF review of educational interventions 'informed by neuroscience',[2] despite the fact that all the research and important findings are based on behavioural psychology rather than brain scans. In fact, behavioural descriptions of 'retrieval practice' first emerged about 100 years ago – and have been repeatedly demonstrated using the strict controls of psychological experiments, but also found to be successful in the messy (but much more authentic) environment of the classroom. [3]

Neuroscience holds powerful promise, especially as a way to help psychologists test some of their theories. However, while it's possible that neuroscience will produce useable knowledge applicable to teaching at some point in the future, personally I doubt it. I wonder whether educational neuroscience represents an example of what the philosopher Daniel Dennett calls 'greedy reductionism'.[4] The activity of neurons is a level of description so far removed from learning behaviour of children in a classroom that it essentially ignores too many important intervening levels of description and theory.

Are we too positive about positive psychology?

Another new branch of psychology, called positive psychology, is also the source of new 'big ideas'. Angela Duckworth's ideas about 'grit'[5] or Carol Dweck's work on 'mindset'[6] probably represent the largest influence of this new field in education – which emphasises positive attitudes toward subjective experiences and life events.

However, the latest theories coming out of psychology are not necessarily a reliable basis for teachers to use to inform their professional learning. Both 'grit' and 'mindset' have run into problems as they come under increasing scientific scrutiny. Grit[7] appears to share a great deal with 'conscientiousness', a dimension of personality already well established and not necessarily something that in adults is especially open to change. It may also have a much weaker influence on outcomes than the original research suggested (the overall correlation between grit and success is only about 0.18).

Mindset research has also run into some difficulty as other researchers have attempted to replicate some of the key findings. For example, many teachers will be aware of the advice that we shouldn't praise intelligence ('You're so clever!'), but rather praise the process ('I like the way you used different strategies to solve this problem!'). However, a recent study[8] found that praise for intelligence didn't appear to reduce cognitive performance and that children's mindsets had no relationship to their school grades or improvement of grades across the year.

The debates in psychology are far from over: both Duckworth and Dweck have defended their work and perhaps future research will better support their claims. This is 'situation normal' in science – new ideas frequently get refined or rejected as new experimental evidence comes to light. The science isn't 'settled' yet, and this makes it an uncertain platform for teachers to base changes to their classroom practice on.

Start with the 'settled science'

Given the to and fro of scientific debate, it would be understandable if teachers adopted a cynical attitude: 'Beware psychologists bearing gifts!' However, I think this would be a mistake.

In contrast to the relatively new fields of neuroscience and positive psychology, there is an example of 'settled science' which has survived many decades of scientific testing – and has examples of applications which have been successfully trialled in classrooms. Based upon a key theory within cognitive science – working memory and its relationship with long-term memory – the field provides us with some general, reliable principles of learning which teachers can use with some confidence when thinking about changes to practice.

There are some excellent introductions to this body of science. Daniel Willingham's *Why Don't Students Like School?*[9] – along with his many *American Educator* articles[10] exploring some of the nuances and implications of cognitive science – provides a jargon-free, invaluable starting point for any teacher. Some of the important reliable principles arising from cognitive science have also been summarised as teacher-friendly resources: for example, *The Science of Learning* by Deans for Impact,[11] and *Organizing Instruction and Study to Improve Student Learning* by the US-based Institute of Education Sciences.[12]

It is the scientific longevity of these theories and behavioural findings which means they provide a reliable set of principles that can help inform, challenge and refine our professional learning as teachers. Where we find the same results, triangulated between laboratory and real-world environments, they have potentially useful applicability within teaching. This is the sort of psychology that can make a genuine contribution to evidence-informed practice within teaching, I argue.[13]

However, while the principles arising from the science of learning are often well established and reliable, that doesn't mean they are 'plug and play'. Teachers looking to improve the revision techniques their students use, or design sequences of learning to exploit the benefits of spaced practice, still need to evaluate whether what they've implemented is having the benefits they anticipated.

Furthermore, let's not pretend that this body of reliable science can solve all of the problems in education. Science can't tell you what the 'purpose of education' should be, or what a 'socially equitable education system' should look like. Wider goals and policy within education aren't the domain of science – but more properly the topic of social and political debate. It would be wrong to seek to circumvent that debate by making appeals to science.

Science is better thought of like a compass – it really becomes useful once you know where you want to go. Where we have a clear goal – and for most teachers I suspect helping children to learn is not the most controversial aim – this is where scientific evidence can, incrementally and by degrees, help us to move in the right direction.

Teaching has long been vulnerable to hype stemming from 'cutting-edge' psychological research and, given that new ideas emerging from psychology are often tentative, sometimes spurious and rarely replicated, it is understandable why some teachers might cynically dismiss the whole field. However, while it certainly is not a panacea for all the knotty problems that keep teachers awake at night, teachers would do well to steer a path avoiding both hype and cynicism. There are some reliable principles arising from long-standing and well-tested fields of psychology that should form part of every teacher's professional knowledge.

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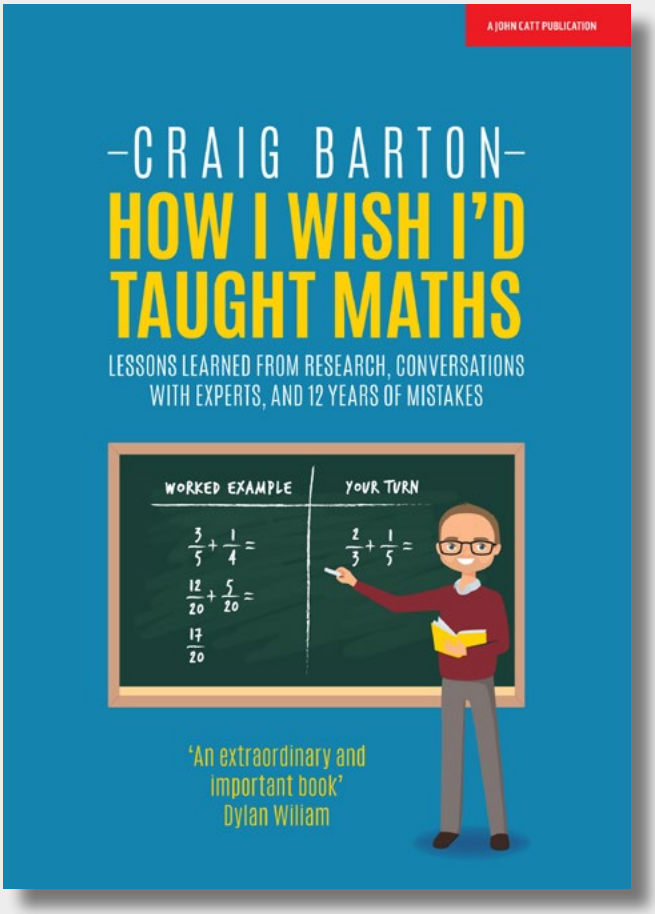


HOWIWISHI'DTAUGHTMATHS

LESSONS LEARNED FROM RESEARCH, CONVERSATIONSWITHEXPERTS,AND12YEARS OF MISTAKES

By Craig Barton

When you speak to the likes of Dylan Wiliam, Doug Lemov, Daisy Christodoulou, Kris Boulton and the Bjorks, you are bound to learn a thing or two. But when he started his *Mr Barton Maths Podcast*, Craig Barton wasn't expecting to have his whole outlook on teaching and learning turned upside down. *How I Wish I'd Taught Maths* is the story of an experienced and successful maths teacher's journey into the world of research, and what it looks like in the classroom.

"An extraordinary and important book."
– **Dylan Wiliam**

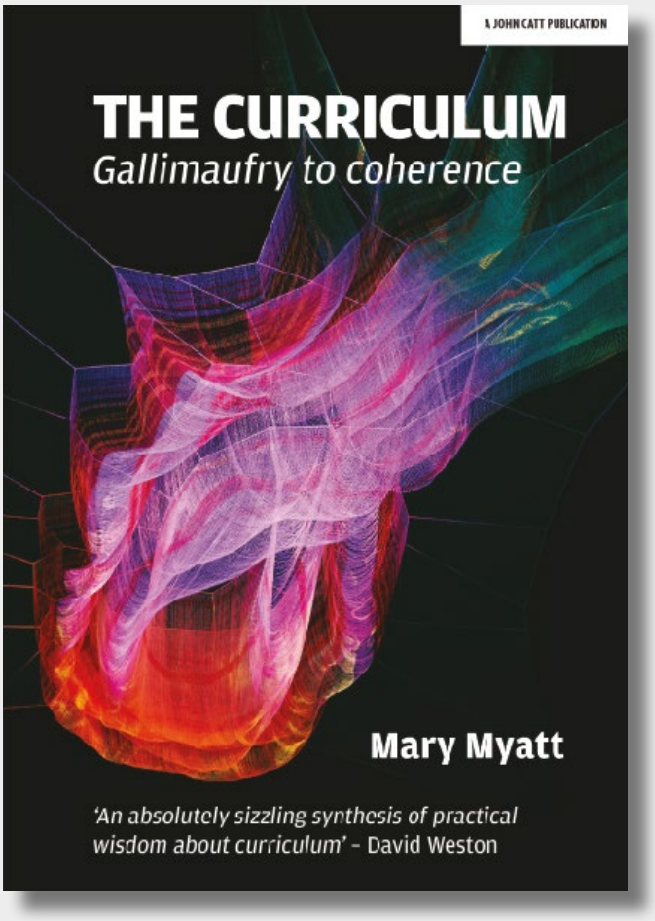
THE CURRICULUM

Gallimaufry to coherence

By Mary Myatt

Increasingly, across the system, people are talking about knowledge and curriculum. In this important and timely book, Mary Myatt is at her brilliant best as she passionately argues that the solutions to overcoming achievement barriers lie in understanding the curriculum and in what children are meant to know.

"An absolutely sizzling synthesis of practical wisdom about curriculum" – **David Weston**



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Independent thinking for education

IN-SCHOOL PROJECT: START A researchED READING GROUP

Adam Boxer

A lot of teachers come away from **researchED** conferences with new ideas and the desire to do something with them – but what? How do they pursue their interest in evidence-informed education? One answer is to do what teacher Adam Boxer did at the Jewish Community Secondary School (JCoSS), London, and form a **researchED** Reading Group. Here he explains what he did, and how people reacted to it.

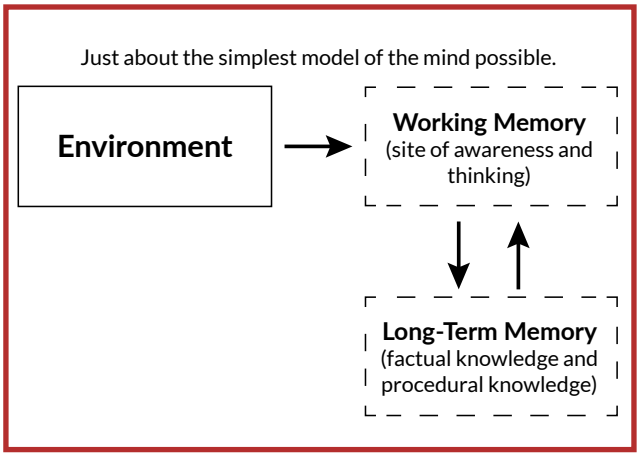
Just over a year ago, a couple of colleagues approached me to ask about research- and evidence-informed practice. Following a conversation with Tom, we decided to set up a local chapter of **researchED** which would meet once a week. The drill was pretty simple: each week I would send out some evidence-based reading and on a Friday lunch we would meet to sit and talk about the reading.

This lasted throughout that summer term, but there were a few problems:

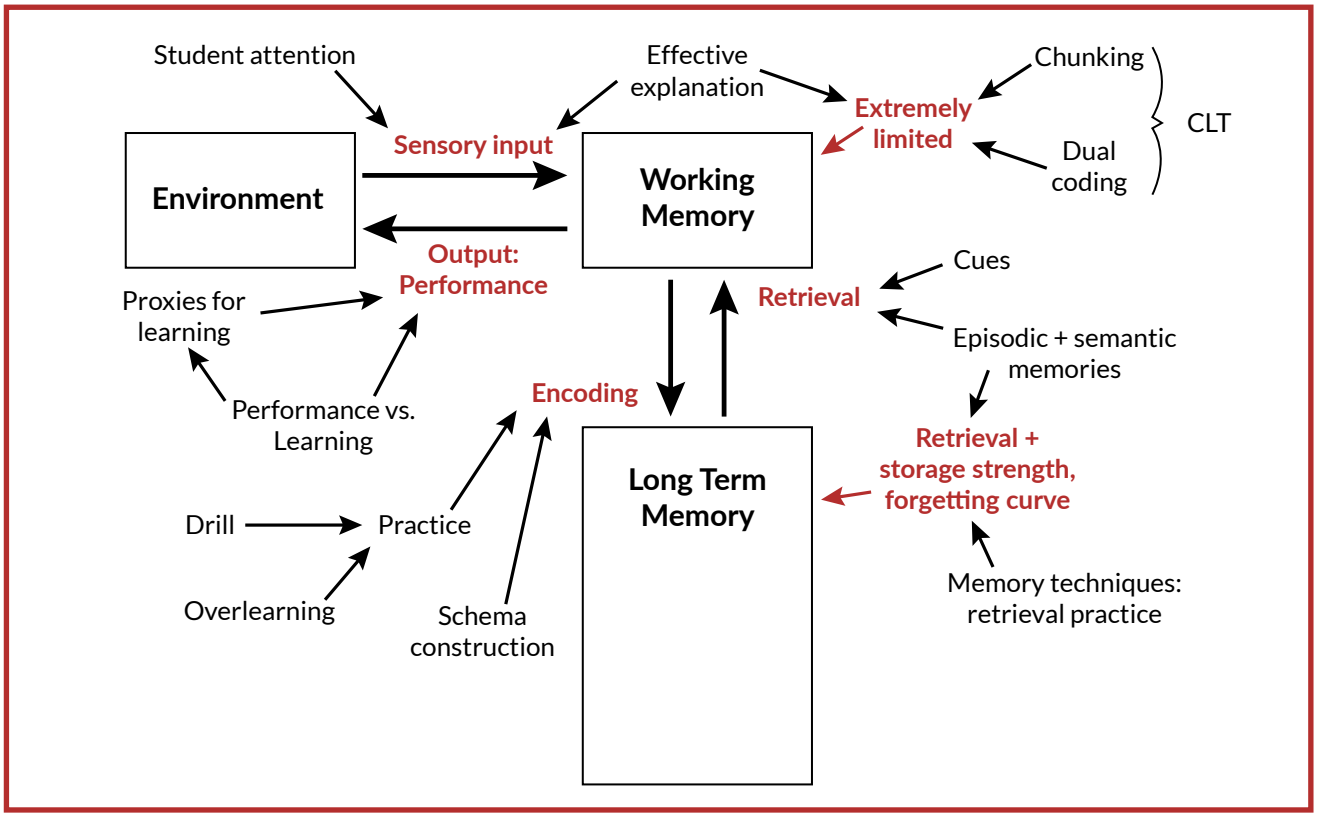
1. The reading was coming in thick and fast – too fast for frontline staff to keep on top of.
2. Some of the reading was a bit technical, and people would have preferred more 'secondary'-type readings.
3. It wasn't part of any formal CPD programme, leading it to feel like something else we had to do.

Despite the above, the feedback was generally positive. People had really enjoyed the conversations and had already found the reading to be influencing their practice: we were keen to continue and expand.

In September of this year I gave a little plug at morning briefing and invited staff to come and join our group. Around 15 staff from across the school (including 3 LSAs) signed up and we met one lunchtime to discuss plans going forward. Most people said that they were interested in learning and how it happens, so we looked at Willingham's simplified model of cognition:



I sketched this up on the board and then we started putting more information around it until we had something looking a bit more like this:



From that basis, teachers were able to identify something that they found interesting and pursue that. I tried to rephrase things as specific questions to clarify and focus our reading. (This wasn't intended to be 'action research' per se; the nature of it was far less formal and structured.) I then provided staff with a bank of readings, and sorted their particular questions by that reading. This would give them a straightforward starting point from which to begin, as well as a lot of 'crossed-over' topics:

What makes an effective explanation?	1 Rosenshine's principles of instruction 2 Kirschner et al., the case for fully guided instruction 3 Ben Newmark, great explicit teaching
How do I ensure that students are behaving in a way that will optimise learning?	1 Joe Kirby, Great School Ethos 2 Doug Lemov, SLANT archives
How can I actually tell if my students have learned anything?	1 David Didau, Why AfL might be wrong 2 Soderstrom & Bjork, Learning versus performance 3 Rob Coe, a Triumph of Hope Over Experience
How can I use students' prior knowledge to circumvent the constriction of working memory?	1 Willingham, How knowledge helps
How can I use visuals to circumvent the constriction of working memory?	1 Dan Williams, Why use visuals? 2 Richard Mayer, principles of multimedia learning
Is drilling students a bad thing?	1 Dani Quinn, Drill and thrill 2 Daisy Christodoulou, is all practice good? 3 Soderstorm and Bjork, Learning versus performance 4 Rosenshine's principles of instruction
What is all the fuss around mastery learning?	1 Mark McCourt, Teaching for Mastery 2 EEF, Mastery learning
How are different memories stored in the long-term memory?	1 Clare Sealy, Memory not Memories
How does low-stakes quizzing improve memory?	1 Me and others, Assessment as learning 2 Toby French, Testing isn't evil
How do I space between quizzing to optimise memory effects?	1 Damian Benney, Optimal time for spacing effects
How is memory dependent on external cues?	1 The Learning Scientists, Transfer 2. Clare Sealy, Memory not Memories

As the year went on, we met as a big group a couple more times; and due to the nature of people's timetables I also had 'micro-meetings' with smaller groups of people who were researching similar topics.

By the end of the year, our main areas of discussion were:

- The use of mini-quizzes and retrieval practice to support long-term memory
- 1:1 work with cognitive load in mind for students with SEN
- How can we know if learning has occurred?
- How can we use the evidence base to better observe teaching and learning?

Throughout the year I also sent out any interesting journal articles or blogs that I had found; and next year we will be sending out a blog every week with a synopsis from one of our group. Hopefully, by having it come from different people, we will achieve better coverage. We were also lucky enough to have Efrat Furst and Flavia Belham come in to deliver lectures on retrieval practice and cognitive load theory, respectively. I have received some very positive feedback from the staff involved.

Next year, **researchED** JCoSS will be part of the school's formal CPD track. We are hoping that this will give us more time to spend on it – as well as being able to reach more staff.

Tips for helping your colleagues become more evidence-based:

- Identify those interested; start with them and then spread out.
- Regularly send out reading; write a brief synopsis each time.
- Narrow people's interests into a very specific question.
- Provide as much relevant reading as you can.
- Don't jump in with peer-reviewed articles. Probably best to start with evidence-based blogs and more 'teacher-friendly' articles like Rosenshine's 'Principles of Instruction'.

Want to start a **researchED** reading group in your own school? You don't need to ask anyone – just go ahead and start one! And if you want to let us know you're doing it and how it's going, get in touch with us at the addresses listed on the contents page. Good luck!

BEST IN CLASS

DO WE EVEN KNOW WHAT EXPERT TEACHING IS?

Peps McCrea

Teacher training is sometimes criticised as being too reliant on weak evidence bases, or leaning on research that is decades out of date or ideologically driven. Peps McCrea of the Institute for Teaching describes the new approach they have taken to designing their Masters in Expert Teaching programme as a response to these concerns.

We started designing the master's course about 18 months ago, and one of the first questions we needed to answer was: what even *is* expert teaching? When we went looking, there were few clear answers.

Fortunately, we found a few pieces to the puzzle, which we've been working to fit together. We recognise that we've still got a lot to learn, but this article is an overview of where we are in our understanding so far.

What do expert teachers do?

In any field, experts are those people who can tackle the most persistent problems of their profession in reliably effective ways. In teaching, our most persistent problem is helping pupils learn, and so expert teachers are people who consistently help pupils make progress.

This *impact* definition is compelling, particularly as it focuses on the very thing we want to improve. Unfortunately, it's really hard to measure.[1] The relationship between teaching and learning is noisy and ephemeral – it's tricky to tease out which aspects of teaching influence learning and so we end up with little insight into how we might actually help teachers get better. The impact definition is insufficient for designing teacher development.

An alternative approach is to think about what expert teachers actually do that leads to this impact. The literature on this appears to coalesce around four broad categories:

1. Perception

Expert teachers see their classrooms in different ways to novices. Like the goalkeeper who focuses on an attacker's posture to anticipate where they will kick, expert teachers are tuned in to the most critical, revealing and often subtle movements of their classrooms.

They perceive events at a deeper level, filtering out everything that doesn't enable them to draw conclusions about pupil learning. In many ways, experts can be distinguished as much by what they *don't* see as what they do.[2]

2. Simulation

Expert teachers are able to mentally simulate the consequences of various actions and events over a range of familiar situations. This allows them to anticipate what might happen well in advance, and so make the most effective professional judgement. This explains why their lessons often appear to *just happen* in fairly uneventful ways – they are constantly several steps ahead of their pupils and others in the room.[3]

3. Execution

Although they tend to do less than their colleagues,[4] and sometimes take longer to arrive at a decision, expert teachers consistently select the most effective

actions across a wide range of situations. They are also more flexible and opportunistic in their choice of actions, and carry them out with fluency and precision.[5]

4. Conservation

Expert teachers do much of their work on automatic pilot. This enables them to devote a large proportion of their mental capacity to monitoring the complex, chaotic environment of the classroom. It also allows them to focus their attention and energy on only the most important teaching processes, and tackle unexpected problems as they arise. As a result, expert teachers are highly sensitive to what happens during a lesson. They can monitor and recall what happens during a lesson, even if they are engaging with individuals.

Defining expertise by what teachers do certainly makes our picture of expert teaching more tangible, but it still doesn't necessarily tell us how to help teachers get there.

For a definition of expertise that has the power to fuel teacher development, we need to look at how expert teachers *think*. More specifically, we need to examine their mental models – what they know, and how this knowledge is organised to guide perception, decision and action in the classroom.

What do expert teachers know?

Expert teachers have vast, complex and refined mental models for the domains of their practice. They don't know everything, but few others will know as much as them about their subject, what their pupils know about their subject, or how to help their pupils learn their subject. Crucially, they know all this in ways that enable them to act with fluency and precision. Expert teacher knowledge falls into four broad buckets:

1. Path knowledge

Knowledge of the pathway towards mastery of a curriculum. This includes the concepts and processes that pupils need to know at different stages of their educational journeys,[6] how these things might be best represented and sequenced, and the common misconceptions that pupils can develop along the way.[7]

2. Pupil knowledge

Knowledge of what their pupils know and don't know, what motivates and concerns them, and how these things change over time. The development of pupil knowledge is produced (and limited) by teacher assessment knowledge – how to assess with validity and efficiency.[8]

3. Pedagogical knowledge

Knowledge of how learning works and how to catalyse it. This is about understanding what goes on 'under the hood' of the classroom, and draws on fields such as cognitive, evolutionary and behavioural science – alongside personal experience – to help teachers build a 'mental model of the learner'.[9]

4. Self-regulation

Knowledge of how to analyse, evaluate and iterate their own thinking and behaviour in order to produce a greater impact, including an awareness of cognitive biases and how to mitigate them.[10] Expert teacher knowledge is threaded throughout with their personal

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If you ask an expert to teach a different subject or year group, or even give them a new group of pupils, they are no longer likely to enable consistent learning. In short, expertise is highly domain-specific.

and professional values. They care deeply about their craft, their subject, and about elevating the life chances of their pupils. As a result, they take full responsibility for their actions, and are generally driven to continually improve their practice.[11]

Importantly, it's not just what teachers know that makes them expert – it's how that knowledge is organised. The mental models of experts are extensive, actionable and fluent. They are organised around the cues they routinely encounter in their classroom as a result of multiple interactions with their pupils.

The vast majority of this knowledge can be accessed and used rapidly, with very little effort. Its automatic nature also means that expert teachers are not always aware of, or able to fully articulate, what they are doing. It can also be hard for them to make and sustain significant changes to their knowledge and habits.

Implications for education

To summarise, a teacher needs to have extensive, well-organised knowledge in each of the above domains to perform with expertise. For example, if you ask an expert to teach a different subject[12] or year group,[13] or even give them a new group of pupils,[14] they are no longer likely to enable consistent learning. In short, expertise is highly domain-specific. Even the PE teacher who is proficient at teaching fitness may be lacking when it comes to teaching racket sports.[15]

This model of expertise has various implications for schools. For example, the 'interview lesson' conducted by many schools during recruitment can limit just how expert a teacher can be in this situation. It also raises questions about how to make the best use of human capital in schools. Is it better for secondary teachers to specialise in phases or for primary teachers to specialise in particular subjects?

In short, teacher mental models dictate what teachers do and what teachers do dictates the impact they have. If we want to help teachers improve, we must strive to develop a greater understanding of all three of these components, how they relate to each other and the implications for how we organise our schools. Without this, our vision of expertise will be incomplete and our power to develop it will remain limited.

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REVIVING RESEARCH ON EFFECTIVE SCHOOLS

Karin Chenoweth

The effect of socioeconomic factors on children's academic achievement is a perennial concern for educators the world over. Karin Chenoweth – writer-in-residence at the Washington-based Education Trust and creator of the *ExtraOrdinary Districts* podcast – considers some often-overlooked research into the power of good schooling.

'One of the common responses of practitioners to any piece of research in the social sciences is that it seems to be a tremendous amount of hard work just to demonstrate what we knew already on the basis of experience or common sense.'

Sir Michael Rutter, 1979

Back in the 1970s Michael Rutter[1] became interested in the question whether schools could affect student achievement. At that time Rutter was already well established as a child psychiatrist but had not yet achieved the international regard that he later garnered after doing landmark work on autism, resilience, and the experience of Romanian orphans after the fall of Nicolae Ceausescu.

Rutter was intrigued by the findings of American social scientist James Coleman who had found, in 1966, that when he correlated all kinds of school factors with student background, background almost always explained student achievement results. 'The school appears unable to exert independent influences to make achievement levels less dependent on the child's background,' the Coleman Report[2] said, casting doubt on whether it was possible to educate children living in poverty.

Rutter found a clever way to test Coleman's finding. He took advantage of a large-scale study of thousands of children in a rather dismal and economically depressed area of London in the 1960s that had collected all kinds of information, including class status (using the proxy of father's job status), academics, delinquency, and health. He and a team of researchers were able to follow up with the 12 high schools most of the students fed into.

After controlling for prior achievement and socioeconomic factors, Rutter's study concluded that a student's achievement depended heavily on which school a student attended. 'We may conclude,' the study says, 'that schools can do much to foster good behavior and attainments, and that even in disadvantaged areas, schools can be a force for good.'

That is to say, he found that schools can make a difference. A big difference.

He and his research team went on to identify the factors that caused some schools to be more effective than others, and the key was school leadership that provides strategic vision and creates what he called a school 'ethos', which he later[3] defined as:

'An orderly atmosphere, an attractive working environment, appropriate well-conveyed high expectations, the involvement of pupils in taking responsibilities, positive rewards with feedback and clear fair discipline, positive models of good teacher behavior, a focus on achievement and good behavior, and good teacher-pupil relationships in and outside the classroom.'

The book that emerged from his study was *15,000 Hours*, a reference to the amount of time most students spend in school.

The really stunning thing about the work Rutter and his team of researchers did is that it is almost totally forgotten. The Coleman Report continues to be cited,[4] along with its many descendants which demonstrate correlations between students' achievement and mothers' educational

There is a distinguished and rigorous research pedigree for those who believe that schools can open worlds and create opportunities for children whose life opportunities would otherwise be circumscribed by their family background.

levels, the number of books in their homes, the number of words they hear in babyhood, and lots of other markers of poverty.

Rutter's report, which pointed to ways that schools might break the correlation between poverty and achievement, is not often mentioned.

The research of American Ronald Edmonds has suffered much the same fate. Like Rutter, Edmonds sought to test Coleman's conclusion and he re-analysed Coleman's original data and studied a large sample of elementary schools in Michigan to find what he called 'effective' schools – that is, schools that eliminated the difference in achievement between children living in poverty and those not living in poverty. His most succinct conclusion echoed Rutter's:

> *'What effective schools share is a climate in which it is incumbent on all personnel to be instructionally effective for all pupils.'*

To establish such a climate required quite a few things, he said, including an atmosphere that is 'orderly without being rigid, quiet without being oppressive, and generally conducive to the instructional business at hand' and 'strong administrative leadership, without which the disparate elements of good schooling can neither be brought together nor kept together'.

That is to say, he found[5] that the way in which schools are organised makes a big difference in whether children living in poverty achieve. Similar to Rutter, he didn't conclude that there was one particular programme, practice or policy that made the difference.

> *'No one model explains school effectiveness for the poor or any other social class subset. Fortunately, children know how to learn in more ways than we know how to teach, thus permitting great latitude in choosing instructional strategy. The great problem in schooling is that we know how to teach in ways that can keep some children from learning almost anything, and we often choose to thus proceed when dealing with the children of the poor.'*

Teachers in low-performing high-poverty schools can attest to the last sentence in that quote. The faddishness and the lack of empirical rigour in evaluating programmes, practices and policies that confronted Edmonds in the 1960s and 1970s continue to this day, plaguing the field and preventing generation after generation of children from learning what they need.

Perhaps it isn't all that important to revive the work of Rutter and Edmonds. Others, such as the UChicago Consortium on School Research, have taken up the research mantle of trying to understand what makes an 'effective' school and how to create one.

But educators with a research bent should know that there is a distinguished and rigorous research pedigree for those who believe that schools can open worlds and create opportunities for children whose life opportunities would otherwise be circumscribed by their family background. That is not to say that poverty has no effect on student achievement. But how schools organise themselves to respond to the effects of poverty has an even greater effect.

Karin's latest book is *Schools that Succeed: How Educators Marshal the Power of Systems for Improvement* (Harvard Education Press, 2017). She will be a speaker at the **researchED** US conference in Philadelphia in October 2018.

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