CONTENTS

Editor
Tom Bennett
editor@researchED.org.uk

Editorial advisors
Nick Rose
Helene Galdin-O'Shea
Greg Ashman

Design assistance
Jo Smolka
Oliver Caviglioli

Editing and production
Jonathan Woolgar
Rebecca Bafico

Advertising
sales@johncatt.com

For more information see www.researchED.org.uk

Published by:
John Catt Educational, 15 Riduna Park, Station Road, Melton, Woodbridge, Suffolk IP12 1QT
Tel: (01394) 389850

Subscriptions and membership:
See www.researchED.org.uk for details

Publishers' notice
The researchED magazine is published four times a year.

MESSAGE FROM THE EDITOR

Welcome to issue 4 of **researchED** Magazine!

One of the reasons I started **researchED** was because of the frustration I felt, as a classroom teacher, about the lack of evidence easily available to the average practitioner. I could see this everywhere in teaching. It wasn't until I explored the world beyond the classroom that I found – to my shock – that it was just as bad at the school level – and the policy level. Of course, this makes sense when you consider how much of what happens in the classroom follows from what teachers are inspected upon, trained in, and supported with. And most of that comes from outside of the classroom.

The past few years have taught me that the individual teacher can move mountains by themselves in the classroom. Indeed, unless things change in the classroom, it almost doesn't matter. But the individual is still enormously influenced by forces beyond their control. It's imperative those forces – budget holders, policy makers, education leaders – are as evidence-informed as possible. It's not just a matter of practical urgency, but a moral imperative. The children with the most to gain from better instruction – i.e. the least advantaged – also have the most to lose by its absence.

This issue, we look at evidence usage at the national level, and see what impact the right – or wrong – decisions can have on the system of teaching. History provides us with a litany of mistakes and false starts, strewn with examples of chances wasted. But there is also cause for hope. The movement for evidence-informed education that **researchED** champions continues to grow. We continue to visit more and more countries – and as we do, interest builds. Now in our fifth full year, we're seeing more and more teachers, leaders and educationalists waking up to the potential of evidence over ideology. It can seem dark at times, but the future may very well be bright.

See you at the next event!

Tom Bennett

rEDitor
Founder of **researchED**

CONTRIBUTORS

Clare Sealy
@ClareSealy

Clare Sealy is the headteacher of St Matthias Primary School in Tower Hamlets. She is interested in the application of cognitive science in the primary and early years classroom

Greg Ashman
@greg_ashman

Greg Ashman is Head of Mathematics at Ballarat Clarendon College, a regional school in Victoria, Australia, and a PhD candidate investigating cognitive load theory.

Steve Smith
@spsmith45

A former Head of Modern Languages, Steve is a writer and trainer for the AQA awarding body in England, and Visiting Lecturer and Subject Lead Tutor at the University of Buckingham.

Faye Craster
@FayeCraster

Faye is the Director of Teacher Development at Teach First. She is passionate about designing and delivering great professional learning that helps teachers thrive and their pupils achieve.

Dr Pedro De Bruyckere
@thebandb

Dr Pedro De Bruyckere has been an educational scientist at Arteveldehogeschool in Ghent, Belgium, since 2001. One of his best points is that he is funny when explaining serious stuff.

Professor Julian Elliott
@JulianElliott11

Julian (Joe) joined Durham University in 2004 from the University of Sunderland where he was Acting Dean of the School of Education and Lifelong Learning.

Dr Niklas Serning
@NSerning

Niklas is the consultant child psychotherapist for Bristol's award-winning OTR charity. He is a senior lecturer and systemic module leader at UWE's counselling psychology doctorate, and a father of two.

Nick Rose
@Nick_J_Rose

Nick worked with TeachFirst as a research specialist between 2016-18, and recently joined the Institute for Teaching where he is helping to design the Expert Teaching Masters programme.

Natalie Wexler
@natwexler

Knowledge enthusiast, education writer. Author of *The Knowledge Gap*, coming in August 2019. Co-author with Judith Hochman of *The Writing Revolution*.

Dr Gary Jones
@DrGaryJones

Gary has over 30 years' experience in education as a teacher and senior leader. He is currently engaged by the University of Portsmouth as a researcher on projects looking at area-based reform and increasing social mobility in education.

Professor Walter Humes

Walter has held professorships at the universities of Aberdeen, Strathclyde and West of Scotland. His publications include work on curriculum studies, policy analysis and history of education. He co-edits *Scottish Education*.

D_ Y_U KN_W WH_T I ME_N? READING FOR INFERENCE

Clare Sealy

Inference, says Clare Sealy, isn't a skill that can be taught. But it can be improved – through knowledge.

I've always found it much harder to teach how to infer meaning than how to decode. With decoding, there's a clear route map. Some children may take a bit longer to travel that route; but if you stick to the path, in the end you will get there. But with inference…some children just get it and some really, really don't. And when they don't, it's really hard to move them on. Why is this?

Having been intrigued and perplexed about how best to teach children to use inference in their reading for many years, I decided to find out what research said about the subject. What I found out was somewhat surprising.

According to Daniel Willingham, the cognitive scientist, it seems that inference as a skill doesn't really exist. That might explain why it's so hard to teach! Willingham explains that inference is more of a trick than a skill.[1] With a trick, once you know it, you won't get any better by practising it over and over again. Skills, on the other hand, improve with practice.

Willingham says that when we teach inference, what we are really doing is teaching children to connect ideas, filling in the missing bits the author has left out. Authors always leave bits out; they don't explain every last detail – just like when we speak, we make certain assumptions about the person listening, assuming they already know stuff and so can join the dots. The difference is that when we talk to someone, we monitor to see whether they are understanding us. We will look at the person we are speaking to from time to time to check for signs that they understand. The person listening will give us some useful feedback, maybe nodding or saying 'mhm' or 'uh-huh' – what linguists call giving 'acceptance signals' – to show they get it. If we have assumed too much and the listener doesn't understand, they will send us a signal by saying something like 'huh?' or by looking baffled. This is our cue to provide more detail.

Books just don't care whether we understand what they are saying or not. They don't monitor our acceptance signals (even though we might nod along as we read a set of instructions) and they certainly don't rephrase what they are saying if we exclaim 'huh?' So the first thing we need to teach children about inference is their own crucial role in checking they are understanding what the text is saying as they read. The book isn't going to stop and repeat itself or explain in more detail if they don't understand. Successful readers expect to understand what they read and know what to do when they spot themselves not understanding. Successful readers don't just read the actual words on the page; they also check that these strings of words make sense. And if they don't, successful readers stop, go back and reread to try to fathom out what the writer is trying to say. If children have never seen this process modelled by a teacher, then how would they know that this is what they should also be doing? Teachers need to use 'thinking out loud' to show how they check for meaning as they read.

The first thing we need to teach children about inference is their own crucial role in checking they are understanding what the text is saying as they read.

They need to model stumbling over phrasing or meaning and then stopping and rereading to clarify the sense. Children need to understand that this is a normal part of being a reader – something expert readers do all the time – and not a sign of failure.

The second thing we need to teach children about inference is that because writers leave bits out, they expect readers to join the dots and connect ideas for themselves. It would be beyond tedious if writers explained everything in minute detail. We are so used to this as expert readers that we don't even notice the gaps; that sentences are connected is obvious to us. Willingham illustrates this with the following trio of sentences[1]: 'Bill came to my house yesterday. He dropped a cup of coffee. My rug is a mess.' The first connection the reader needs to make is one of coherence inference: the reader needs to connect 'he' with Bill. Then there is elaborative inference: the reader is expected to draw on their life experience and general knowledge to connect the three sentences together. In this case, the reader is expected to make the connection that the cup of coffee that Bill dropped is the cause of the mess on the rug even though this is not stated. This is all so obvious to us as expert readers that we don't even notice we are making these connections and are baffled when children fail to make them. Teachers need to help children understand how to do this by 'thinking out loud' as they read aloud to pupils, showing how they are seeking to make connections between different elements of the text, thus making explicit the thought processes involved in making inferences.

The research shows that teaching children these two techniques is quite important, but there is little benefit to be had in teaching this for more than a few lessons because the techniques of monitoring one's understanding and then trying to make connections are easily learnt within a few hours of instruction.[2] No additional benefit is gained by spending any more time on mastering these techniques beyond this. That's because once you know these tricks, the only things that will get in the way of understanding texts are **gaps in your life experience, general knowledge and vocabulary**. You will realise you don't understand something and try to make the necessary connections, but still fail because you don't have the knowledge to know how the things you are trying to connect actually relate. So instead of spending too much time on teaching children how to infer, 'acquiring a broad vocabulary and a rich base of background knowledge will yield more substantial and longer-term benefits'.[1]

If we want our children to be able to make inferences about what they read, then we need to afford them every opportunity to acquire the kind of rich background knowledge that the most advantaged children routinely acquire at home. Since the humanities and science lessons are the main places where children will gain this knowledge, cutting back on foundation subjects to improve reading is a false economy and should be resisted.

REFERENCES

1. Willingham, D. T. (2006) 'The usefulness of *brief* instruction in reading comprehension studies', *American Educator* 30 (4) pp. 39–45, 50. Available at: www.bit.ly/2K8KVvM.

2. Willingham, D. T. (2017) 'What happens when you teach children to make inferences while reading?', *Daniel Willingham – Science & Education* [Blog]. Available at: www.bit.ly/2K3GLoE.

Sponsored by John Catt Educational and Crown House

CURRICULUM THINKING

THREE MASTERCLASSES

JOHN TOMSETT

TOM SHERRINGTON

MARY MYATT

DESCRIPTION

This is an opportunity for teachers and leaders to participate in three 90 minute masterclasses delivered by three prominent thinkers in the area of curriculum design and implementation. Each masterclass will include an extended presentation with interactive elements and time for questions and discussion. The event concludes with a panel session where participants can pose further challenges and questions.

Presenters' books will be offered to participants, included in the ticket price.

More Curriculum Thinking Master Classes Events with me, @MaryMyatt and @johntomsett are now LIVE: Join Us!

30TH SEPTEMBER 2019 - BIRMINGHAM https://bit.ly/2Cezihe

1ST OCTOBER 2019 - MANCHESTER https://bit.ly/2F6ZPyG

15TH OCTOBER 2019 - LONDON https://bit.ly/2SWVvWx

16TH OCTOBER 2019 - CARDIFF https://bit.ly/2J7pZp5

Tickets £99

Refund Policy
Refunds up to 30 days before event

THE SUBTLE ART OF SLOWLY LOSING CONTROL

Greg Ashman

A great deal of evidence points to the superiority of teacher-led instruction in terms of transmitting content memorably and effectively. Here, teacher and PhD candidate Greg Ashman considers what this meant for his own teaching, under what circumstances we might use guided instruction, and when less guidance might actually be useful.

For years I was a guilty teacher. I would stand at the front of the class, explain concepts to students and ask them to take notes and answer questions. I was furtive. I knew I should be organising group work, inquiries and projects, but I could never get these to work very well. For some strange reason, students seemed to do better at answering questions and solving problems if I first explained to them how to answer the questions and solve the problems. I seemed stuck.

It was only later that I learned that the evidence for less-guided forms of teaching, such as inquiry learning, is relatively weak and there is in fact a large body of evidence supporting a more explicit approach.[1] I also realised something else that was equally significant for my own work: I had lost time. Despite teaching explicitly, I had not used the most effective forms of explicit teaching because I did not know what they were.

It is important to understand explicit teaching as a process rather than a single classroom event. The key feature of explicit teaching is that students have concepts fully explained to them in advance of having to apply these concepts. Explicit teaching is not about giving a lecture[2]; it is about a plan for the gradual release of control from the teacher to the students. Initially, the teaching is fully guided, but as students gain expertise, the level of guidance is gradually reduced until they are involved in complex problem solving or the creation of a novel product such as an essay or artwork. The teacher who claims their approach to inquiry learning includes a lot of 'explicit teaching' is therefore using the term in a different way to me.

As a young teacher, I tended to explain or demonstrate a concept and then ask students to answer questions or solve problems. However, according to teacher effectiveness research,[3] teachers whose students learn the most tend to guide student practice. They follow an 'I do – we do – you do' approach, with plenty of time spent in the 'we do', whereas my natural teaching style could be characterised more as 'I do – you do'.

So what does guiding student practice look like? This is one of the key questions that has been driving my work over the last few years and it is a question I would like you to think about.

The first point to raise is that if we want students to do something, we need to model it. Once we have communicated the main ideas, we also need to show students how to demonstrate their understanding. For instance, if we want students to write a paragraph on the role of the nurse in the play *Medea* by Euripides then it is not enough to simply explain the role of the nurse in *Medea* and then ask them to write a paragraph. Unless the students are relatively expert writers, we will also need to model the process of constructing the paragraph.

There is an interesting distinction we can make here between providing a model and modelling. One approach could be to simply provide students with a model paragraph to guide them, similar to providing maths students with a worked example to follow. Another approach would be to give an annotated paragraph that explains the choices that were made by the writer. This provides an additional level of guidance. Yet another approach might be for the

teacher to (appear to) construct the paragraph in front of the students, explaining the choices he or she makes in the process.

The involvement of the teacher in this way may not include providing any more guidance than the annotated model, but there is reason to suggest it may be even more effective. This evidence comes from the realm of multimedia learning, where software designers try to create packages of text, audio and video that students can learn from. Richard Mayer has completed many studies into what makes these packages more or less effective and has developed 12 principles.[4] One of these is the 'embodiment principle' and it suggests students try harder if an on-screen figure draws diagrams and gestures in a human way rather than staying static. Mayer suggests this is because of the social connection that is created between the figure and the students. I would suggest that this is the difference between teaching and handing out a sheet.

Other guidance on what the middle stage of explicit teaching might look like is available from the extensive body of research that supports cognitive load theory.[5] For example, this research has identified a number of effects and one of these is the 'problem completion effect'. Rather than simply providing worked examples and then asking students to solve similar problems, 'completion problems' are worked examples with some of the steps missing. Depending on the level of student expertise, these could be used from the outset or as part of the process of gradually fading guidance and handing control to the students.

In maths, a completion problem may be a standard worked example with a step missing. In English or history, it might be a paragraph with the topic sentence or a quote missing.

In many of the tasks we ask students to complete there are obvious traps they may fall into. To avoid this, it could be helpful to use non-examples or non-models (i.e. examples that demonstrate what not to do). The teacher could display the response from some fictional character who always messes things up and ask the students to spot the errors. Look, Billy Bloggs has not addressed the prompt! Look, the evidence Billy uses does not support his contention! This process gives useful information as to how ready the students are to tackle the task for themselves.

Rather than simply providing worked examples and then asking students to solve similar problems, 'complex problems' are worked examples with some of the steps missing.

And readiness is something I used to neglect. When I started teaching maths, I use to push students into independent work too soon. After a phase of the lesson that would be teacher led, I would give students a series of questions to answer – pretty much at their own pace – while I monitored them before going through the answers at the end.

I am now clearer about the risks of this approach. If a student has a key misconception then repeating this misconception through a series of activities will reinforce rather than dispel it. The solution is to again pay more attention to the phase in the middle. If you walked into one of my lessons today, you would be likely to see the students completing questions on mini-whiteboards in step with each other. This way, I can address issues as they arise and hopefully prevent students from taking them forward to the next task.

These are just a few suggestions as to how to gradually fade guidance and hand control over to the students where it rightly and ultimately belongs. The middle ground is fertile ground. It is a space for creativity. It is a place where expertise is growing and where we can become more playful. By working on the tasks that occupy the middle ground, we have a chance of developing into more-effective teachers.

REFERENCES

1. Kirschner, P. A., Sweller, J. and Clark, R. E. (2006) 'Why minimal guidance during instruction does not work: an analysis of the failure of constructivist, discovery, problem-based, experiential, and inquiry-based teaching', *Educational Psychologist* 41 (2) pp. 75–86.

2. For a discussion of different definitions, see Rosenshine, B. (2008) *Five meanings of direct instruction*. Lincoln, IL: Center on Innovation & Improvement.

3. Rosenshine, B. (2012) 'Principles of instruction: research-based strategies that all teachers should know', *American Educator* 36 (1) pp. 12–19, 39.

4. Mayer, R. E. (2017) 'Using multimedia for e-learning', *Journal of Computer Assisted Learning* 33 (5) pp. 403–423.

5. Sweller, J., Ayres, P. and Kalyuga, S. (2011) 'The worked example and problem completion effects' in *Cognitive load theory*. New York, NY: Springer, pp. 99–109.

researchED

A MESSAGE FROM OUR FOUNDER, TOM BENNETT

We've managed to do so much with almost nothing. So far we have just about broken even with ticket sales (at deliberately affordable prices) and event-by-event sponsorship. Our ambition is to start to build a small core team who can run these days, and our website, so that we can grow, and offer more free resources and low-cost days to the education communities. Your donation would fund the time of this core team, plus help us to rebuild and maintain our website, which is crucial for sharing free resources from conference days.

We believe that we are on the edge of an evidence revolution in education. But it won't happen by itself. Please donate to our project, and help us help teachers, schools, and most of all students. And help us to keep our independence.

We'd be deeply grateful for any assistance you can give, because while all of our efforts are done for the greater good, it is often desperately hard for an entirely volunteer-driven organisation to be sustainable. Your donation can help us to continue to do the good work we do, and to build and grow so that we can do more in the future.

Thanks for reading!

MAKE A DONATION

www.gofundme.com/help-researched-bring-evidence-into-the-classroom

SCREEN QUEEN

TOM BENNETT INTERVIEWS AUSTRALIAN PHONICS CHAMPION **DR JENNIFER BUCKINGHAM**

Dr Jennifer Buckingham is the Director of Strategy and Senior Research Fellow at MultiLit, a literacy programme provider and research unit in Australia. A prominent figure on the Australian literacy stage, she previously spent two decades at the Centre for Independent Studies, most recently as Senior Research Fellow and founder of the FIVE from FIVE initiative. She has published numerous reports and articles on reading instruction and has provided advice to state and federal governments on literacy programmes and the introduction of a Year 1 Phonics Check. Jennifer is a board member of the Australian Institute for Teaching and School Leadership. Jennifer's PhD was in the area of literacy and social disadvantage, supervised by Professor Kevin Wheldall and Dr Robyn Wheldall. I caught up with Jennifer at the Literacy, Language and Learning conference in Perth, Australia, in April 2019, where we talked about her career, phonics, and the political landscape of Australian education.

TB: Thanks for speaking to researchED magazine. How did you get started?

JB: I started working at CIS at the end of the 1990s as a research assistant. And I was enormously fortunate in that I got to work with and under the mentorship of a fantastic social scientist and a fantastic social economist – Barry Maley and Helen Hughes. They really showed me the ropes in policy analysis. And they whipped my writing into shape. They and CIS founder Greg Lindsay were hugely influential on me.

I had a science degree and majored in psych so I already had stats training and the science background that was a good grounding. But it wasn't until I started at CIS that I got exposed to ideas that were just really exciting but also a bit of a shock – I had not been exposed to any of that kind of thinking before.

Behavioural economics was a new idea for me, for example. I started working on a publication that was a statistical companion of 100 years of social and economic trends in Australia. I was using statistics that weren't online at that stage – this was before we had internet in the office.

TB: However did we cope?

JB: It was brilliant. I am so grateful that I started without the internet because I had to go sit in the dusty old Australian Bureau of Statistics library and one by one pull a book off the shelf and find the data I needed to create the trend, but while I was doing that it exposed me to a whole lot of other stuff that I hadn't been looking for and there are things in libraries that are just not online. Things

that I came across and read that I would never read if I was starting out today. They're just not there. They're often tangential to what you're looking for and sometimes influence what you're doing.

So in the course of doing that statistical work, I was also keeping an eye on educational issues. What I noticed was that all of the talk at the time was around trying to improve the performance of girls: affirmative action, trying to get girls to take higher level subjects, do more science and so on. That was the narrative – girls were doing worse than boys. And when I looked at the statistics, it was the opposite. It was boys that were not succeeding in schools. It was boys that had higher rates of illiteracy. All of these trends, whether it was juvenile justice, whether it was suicide rates, no matter what I looked at, it was boys that were really struggling. I realised at that point that actually, like Thomas Sowell has written, that the statistics we were being presented with in popular media just weren't necessarily the whole story and so I wrote a little book called *Boy Troubles* and it opened up this massive can of worms.

I was 24 I think when all of this happened, and there were lots of people who it turned out had been worried about this issue – particularly fathers who were watching their sons fall apart in the school system and not being catered for, their needs not being recognised, and they were devastated by it. They saw my books and articles as a lightning rod. That response led to a parliamentary inquiry into boys' education so that brought it into the mainstream: this idea that, actually, boys might be having a bit of a bad time and why. And that then started me on the path to looking at literacy more. Because when I started to look at the reasons that boys' literacy rates had been declining, it coincided with the change towards a 'whole language' approach to teaching reading.

TB: When did that happen?

JB: It peaked in the '80s.

TB: Why was that narrative not already coming through from the data?

JB: I think the data were very clearly there, but again it's about the culture of the time, and the culture of the time was concern about girls and if you tried to counter that in some way then that was heavily resisted for whatever reason, I can't say why, but that was not the accepted story. And I think the fact that I was a young woman was helpful because I had no children, I wasn't a man out there saying 'What about the boys?'. The messenger shouldn't matter, because the truth is the truth; but for whatever reason people are sometimes more willing to listen to one person than another. And at that moment they were willing to listen to me.

TB: Did you experience any resistance to your ideas?

JB: Oh yes, there was character assassination, and all that goes along with it. It was true that girls weren't participating in science at a high level in maths and science, and that's still a problem – and possibly will always be a problem. That doesn't mean we don't care about it, but I don't think we can just solve it by trying to make it more attractive or 'friendly'. I do think there are some differences in that area, in terms of interest, not ability: interest.

> At that point, I actually realised, like Thomas Sowell, that the statistics we were being presented with in popular and traditional media just weren't necessarily what was the case.

TB: So you were 24 when that happened? Social media wasn't around at that time, so you couldn't be swamped upon by a digital mob.

JB: No, it was letters to the editor!

TB: So you developed an interest in literacy. Where did that take you?

JB: I worked on lots of different areas of education policy – school choice, school funding. Sometimes it feels like not much progress has been made in some areas; but looking back now, actually in many ways the situation we're in now would have been difficult to foresee. Now, it's largely accepted – in Australia at least – that there will be public funding for schools of all different types and that it will be needs-based to some extent, and that having a healthy non-government sector is a good thing, as long as you have a healthy government sector too.

You can't have that competitive effect if one sector is thriving and the other one is not. And I think now we're at the stage where the government school sector is pushing back against the non-government school sector – partly thanks to the publication of NAPLAN data providing evidence that many public schools are doing very well. And I say that not as someone who is picking a side, I just think that's helpful for everybody. Compared to 10 or 15 years ago, there aren't very many people now in Australia who are arguing that non-government schools should get no government funding. That's just not a mainstream opinion anymore. They'll argue about the amount but not the principle.

TB: FIVE from FIVE. Tell me about that, because that's where I first came across you.

JB: FIVE from FIVE came about because I became very interested in literacy throughout all the other work that I was doing. I got the opportunity to do a PhD with Kevin Wheldall and Robyn Wheldall and again fell into a situation where I had these two incredible mentors. The experience was just fantastic. The school I worked with was great. They took a calculated risk in participating in the project but it had good results for everyone. If I have

had any success, it's because I've so fortunate, having these great people to help me along the way. So I got to work with Kevin and Robyn really closely and then from that I thought I can do something with this: combine the scholarship from the PhD with my policy work and strategic thinking.

FIVE from FIVE provides information and resources but not in a passive way. I seek out people who I think need to be aware of this evidence. FIVE from FIVE isn't just about phonics – it's about the five essential elements of reading instruction, of which phonics is one. But phonics is the least well understood and is the weakest link in a lot of classrooms. I have been arguing strongly to introduce the phonics screening check, which was a definitive policy that I could try to achieve, instead of just saying to governments, 'Well I think that reading instruction should be better; I don't know how you can make it better but that's your problem.' The phonics screening check creates the impetus for change in reading instruction. Quite early in the FIVE from FIVE project, I realised I was trying to sell a solution to a problem that people didn't acknowledge existed.

TB: That's interesting. Tell me about the context. So what did people think about literacy, and how was it being taught when you first started?

JB: I was saying, 'This is effective instruction, all the evidence is there, this is what schools should be doing', but all I got back was 'We are teaching phonics.' The response was either 'We're teaching phonics already', or 'No that's not the best way to teach'. For the former, I thought, 'Well, you may think you are, but the reading levels of your students indicate that you're not.' I didn't really have a lot of direct evidence about what schools were and weren't doing at that point; it's not like I could sit in every classroom to see what was going on. But if I looked at the programmes the schools were using, the policies governments were pushing, the kinds of research literature that were popular, the books people were really latching on to, the articles they were interested in – it certainly wasn't an evidence-based approach that was the one that seemed to be the most popular.

TB: So what was popular then?

JB: The 'balanced literacy' approach, which is neither one thing or the other. It can mean anything you want it to mean, but it usually means whole language with a bit of phonics on the side. It's certainly not systematic or explicit. People thought that's all you needed to do.

TB: Why did you think a phonics screening check was important?

JB: It would be a good way of demonstrating that there is a problem with phonics instruction, and would provide the catalyst to make some changes. I talked to lots of principals and teachers and I talked to everybody who would listen. There are principal surveys where most say they are not confident in the ability of graduates to teach reading and so they accept that it's a problem; but I couldn't convince them to publicly support something that would give them the data they needed to push back on universities who

say they're preparing graduates well but are not. The fear of data is a very difficult thing to counter and principals associations were worried about the pain that a low result on a phonics screening check might cause to them, and wouldn't see it as short-term pain for a long-term gain.

TB: It's like stepping on scales the first time and realising you need to diet.

JB: Yes, you need to know the extent of the problem, and then hopefully do something about it. Or to be able to push back on the people who need to do something about it.

TB: Do you think some people in the reading instruction community want to sabotage the use of phonics?

JB: There has been a shift in the language that's used around reading instruction. Because there is all this evidence, those who want to teach in a different way know they have to say they teach phonics; they know they have to say they're using explicit instruction. But they twist it, so that those terms have lost their precise meanings. Everybody says that they're doing explicit instruction, but most of the time they're not. Or they say they teach phonics, but often that means pointing out some letter sounds while they're doing guided reading. That kind of thing is not systematic. There's also so much going on in the reading debate that's not even about reading. It's just about tribalism – this tendency to pick a side and then just stay on that team and oppose everything the other team does. That's what I find so frustrating. For example, because some unions disagree with me on school funding and school choice they will oppose my views on reading simply because they have decided I am the enemy.

TB: 'If we disagree about one thing, you must be bad, so we must disagree about everything.'

JB: Right. The attitude is, 'Because we don't want to agree with you on that, we are then going to – by default – back the team that is opposing you.' So, you get into this completely unproductive situation where there's no willingness to seek any common ground. It's a 'my enemies' enemies are my friends' kind of deal. All you can do is try to work around people who oppose you on that basis, rather than work with them even though that is what I would rather do, and I do try.

TB: What are the basic principles of FIVE from FIVE?

JB: We named it FIVE from FIVE because the evidence is so strong around the five key elements of reading instruction that came up most consistently in research about the teaching of reading. As I said, phonics is obviously just one of those, but that's where I can see the biggest impact being made, if you can get that right. Schools that do get it right establish fluent decoding in those first couple of years of school, which allows them to put their heart and soul into everything else later. Because you don't need to keep going with phonics forever, it's called a constrained skill; once children have learned it, they've learned it. It's become part of their reading reflex, it's how they read now.

TB: It's the times table of reading.

JB: You don't need to revisit it once it's established. The other part of the FIVE from FIVE is 'from about the age of five', so when kids start school, and we're focused on the early years of school. Of course we acknowledge that pre-school and early years of education is important, but it's from about age five that you can affect the learning progress of 100% – or as close to 100% as possible – of children. Pre-school attendance in Australia isn't universal, so it's very difficult to have any impact at the policy level, because all those centres are doing their own thing, and also the evidence isn't quite as strong in terms of the most effective instruction methods. The other thing that FIVE from FIVE does that is different to other projects is that we try to work at three levels of influence. At the policy level, where I think we have probably been most effective, at the teacher and school level, and then at the teacher training level, which I have left till last. That's the hardest one. I have a report coming out on preparation to teach reading in initial teacher education courses in July.

TB: Teacher training/prep seems to be a vital place to change things.

JB: Teachers can't teach what they don't know and it's terribly unfair to send them into classrooms without that knowledge. The other important place is at the school level. We run events like the phonics roadshows, and interact with teachers using social media. We try to publish in places where teachers will read it. But there's little point having teachers knowing what they need to do if policy is working against them. There are growing numbers of teachers trying to do the best thing in terms of instruction and collecting great data, but they have education departments telling them to do something different or judging them against measurements that completely contradict what they're trying to do. For example, requiring teachers to send in levelled reading numbers when levelled readers encourage predicting from pictures and context cues, and are not a great measure of decoding skill.

It's taken a while to get to that pinch point and this is a relatively new problem; the policy is contradicting the practice, and vice versa. But it's still progress on where we were even five years ago.

Because there is all this evidence to support phonics, those who want to teach in a different way know they have to say they teach phonics. But just because they say they're doing it doesn't mean they really are doing it.

> The result of getting the instruction right is that you can then have these amazing conversations about what they're learning and what they're reading.

TB: Is the situation getting better?

JB: In schools, yes, it's slow but significant. Policy is also improving. But in universities, it's still pretty bad.

TB: Why? Tribalism?

JB: Yes; it seems that a lot of the academics who have taken an evidence-based approach have just been gradually pushed out.

TB: Still?

JB: It's still the case that you take your career in your hands if you try to change that culture. Within some education faculties, the overriding philosophy is still an adherence to whole-language, socio-cultural models of reading and if you try to bring science into it, either you're marginalised into special education (and there's lots of good people in special education) or out the door. I've seen it happen to people that are passed by for promotion, gradually had their hours reduced, all that kind of thing. It's terrible. And it's why organisations like MultiLit and CIS are so important.

My experience on the AITSL board has given me even greater insight into the difficulties of policy change, and who are all the people who have a say in whether or not something becomes policy. There are so many. I was surprised to hear from Stanislas Dehaene today that there's a French phonics check, and that's brilliant. I feel quite certain that if we didn't have a federation in Australia, we would have a phonics check. We have a system of government where each of the states decides what they want to do. And they are typically very risk-averse, in terms of doing anything particularly new, and so if one won't do it....

TB: Isn't that an opportunity for one state to be bold and stand out, perhaps?

JB: Well it's risky to do things differently. If you change something at the national level and it doesn't work, then everybody's in trouble, which is a plus side of federation. And that's what's wonderful about South Australia: they've implemented the phonics check, and they're seeing some really great results from it, and I hope that within a year or two other states might follow.

It takes a minister who has the strength to listen and act. In South Australia the education minister at the time said, 'I'm hearing two different sides to this, so I'm going to run a trial, and I will make my own mind up based on that trial.' The current education minister backed it and has been a great advocate. And to me that bi-partisan approach seems the obvious way to go about it. But it's getting over that lack of momentum sometimes in governments that's the challenge.

TB: In the UK it was driven by exactly that – an informed minister who was prepared to go where the evidence led him.

JB: Definitely. Here, it's very difficult, but to make things happen you just have to put up with the critics – sometimes it's disheartening but there have been enough little victories to sustain and keep going.

TB: Do you have hope for the future of reading instruction in Australia?

JB: Definitely. Through doing the phonics roadshows I've seen schools doing some really remarkable things – not just with phonics but across the reading curriculum. Since FIVE from FIVE started, I've had schools contacting me saying, 'We've been following what you've been saying, reading the literature, changing our practice, and here are our results', and that's just fabulous. Many of these schools are lifting literacy levels among the most disadvantaged children in Australia. Their facilities are often limited, but they're doing the best with what they have. In a school I visited in Western Sydney in which almost all children are from non-English speaking backgrounds, I sat in a Year 3 class to see the downstream impact of high-quality early years teaching. The conversation in the Year 3 class was astonishing. They were articulate, their vocabulary and the depth of analysis was incredible. It's not just theory, this is actually working and there are so many examples to draw on.

TB: So Southern Australia has adopted the phonics check. How long has that been going on, and is there any data coming out of that?

JB: Yes, South Australia's pilot found that a minority of children achieved the benchmark. That was, in itself, useful information. It showed that even though most of those schools said they taught phonics, most of the children didn't know phonics well. The other important information from that trial was that teachers liked the check. They said it provided data or information that surprised them, that they thought the children would do a lot better than they did, and that they found it easy to administer, easy to interpret and found it useful in terms of changing their practice. And the kids enjoyed it.

TB: And seeing small incremental steps of success. Kids love that. 'Oh I'm good at something.'

JB: Yes, most children will learn to read eventually, even if they don't have great instruction, but there's a huge opportunity being missed by waiting instead of teaching. They could've read a lot sooner; they could've been learning while they were reading, their vocabulary could have been growing. The best thing is to give them more structure from the beginning.

TB: So, what's next for you?

JB: I'm moving from CIS and I'm going to be working for MultiLit, which is the company started by my PhD supervisors, and which I'm really looking forward to.

JB: The role is director of strategy and senior research fellow. MultiLit came out of Kevin and Robyn seeing a need for an evidence-based intervention programme for students struggling with reading. Individual intervention in schools is always expensive because it's labour intensive. So they developed small group instruction because research was showing that you could, for a lot of children, get the same effect in a small group as you could in one-to-one intervention, at a lower cost to schools and potentially help more children. People kept asking for comprehensive whole-class programmes, so a programme for initial reading instruction was next. These programmes take years to develop because they are so heavily researched and evaluated.

It would be ideal if all teachers came out of their teacher education with the knowledge to become expert teachers of reading. In the meantime, though, MultiLit fills a need. But even for expert teachers, a well-designed programme can be a great help, they don't have to create all their own resources so they can focus on teaching, and they get their weekends back.

TB: We re-invent the wheel a lot in education. Wouldn't it be great if teachers were guaranteed to get that in teacher training? I speak to a lot of teachers who realise years later that they weren't trained well.

JB: There are principals in Australia that would rather hire a PE teacher to teach early primary than someone who has done a whole lot of literacy study at university because they don't have to un-teach the bad information they've learnt at university before they can start training them in the best way to teach.

One thing that is really helpful is the evidence-based movement, of which **researchED** is at the forefront. I'm very pleased to have been involved in that from fairly early days. And actually FIVE from FIVE was incubated at the first **researchED** in Sydney. I went along to that with the idea for FIVE from FIVE, and talked to lots of people there. They convinced me that it was possible to do a project like that. In lots of little ways we all influence and support each other.

JB: It's a matter of gaining critical mass. This applies to both FIVE from FIVE and **researchED**. You don't have to convince everybody – that's an impossible task. You just have to gather enough people so you're not seen as a fringe group that's trying to fiddle with things around the edges. You need to have enough people on board that there can be some change that's going to stick, rather than a one-off blast and then everyone goes back to the way things were.

TB: Jennifer Buckingham, a pleasure to speak to you.

researchED International....coming to a country near you.

SINGLE, BILINGUAL

WHAT DO WE NEED TO KNOW ABOUT SECOND-LANGUAGE LEARNING?

Steve Smith

Although recent advances in the 'science of learning' have influenced teacher practice, language learning is different in important ways to learning in other disciplines. In particular the nature of linguistic 'knowledge' significantly affects how teachers should teach. Steve Smith looks at some key strands in research into second-language learning and suggest ways in which teachers might benefit from it.

Many language teachers have happily embraced various findings from what's often referred to as the 'science of learning', including the importance of spaced retrieval practice, interleaving, cognitive load theory and the benefits of explicit teacher-led instruction. Even if they're unfamiliar with the latest research findings, effective teachers often do these things instinctively or through experience. They're supported by a recent report[1] into language-teaching methodology by the Teaching Schools Council (TSC) which carried out a Department for Education-sponsored selective review of literature, observed a large number of lessons and interviewed teachers in a variety of secondary schools. Practices supported included systematic teaching of phonics, a planned approach to explicit vocabulary teaching, and explanation and practice of grammatical structures.

Traditionally, however, the scholarly field of second-language acquisition has come from different perspectives, not just those of cognitive science. These have led to a number of pendulum-swings over the decades. Behaviourism from the field of psychology spawned audio-lingual language teaching, with its emphasis on repetitive drills and habit formation; a strong British current of 'direct method' oral teaching, with a stress on developing grammatical and lexical skill by avoiding translation and sticking to the target language can be observed in many a classroom; and the powerful communicative language teaching movement, characterised by the functional use of language, continues to be a huge influence in language teaching. In light of the variable success of these approaches, it's often said that we're now in a period of 'principled eclecticism', with teachers taking the best bits of prior approaches and various research strands.

But what makes second-language learning distinct from other disciplines is the fact that, according to a large majority of researchers, most learning occurs implicitly or sub-consciously, just as when young children acquire their first language. Thus language learning is somehow 'natural' in a way that many other forms of learning are not. Everyday evidence for this can be seen when students spend time abroad on a school exchange visit. After a couple of weeks of immersion, without any explicit teaching at all, students' comprehension and fluency is measurably improved. How did this happen without teaching? So should classroom practice primarily aim to ape the processes of first language acquisition by just trying to provide as much meaningful language input as possible, letting nature take its course? This is where the debate can get heated!

Traditionally it's been assumed that by presenting, practising and using new language structures, students gradually build up the internalised grammatical and lexical capability to understand and speak. Unfortunately research doesn't (yet) lend much support to this view of how new languages are acquired. Evidence suggests that, just as with their first language, learners 'acquire' (i.e. become proficient in) grammatical structures – for example tenses and verb endings – in an order that's somewhat immune to teaching. Although the first language can influence how we learn the second, the argument runs that acquisition follows a natural trajectory – we're just hard-wired with a Chomskyan

'language acquisition device' to pick up languages in certain ways. Some conclude from this that all a teacher can do is provide interesting language exposure at a comprehensible level and the opportunity to interact with it. The most famous scholar supporting this view is the highly influential Stephen Krashen.[2]

In stark contrast, some researchers and many teachers believe language learning takes place at least partly along the lines of any form of skill learning – for example, learning to play tennis. The teacher explains a structure, show lots of examples of it in written and spoken texts, get students to practise it in controlled exercises, then in free speech and writing. This view is essentially supported by the TSC report,[1] which argues that structures become 'automatised' through repeated practice in meaningful contexts. In addition, some argue that in the school setting there's simply not enough time for the natural processes of acquisition to occur.

Others prefer to stress the importance of learning language through real-life task-based activity, arguing that language learning is a social activity as well as a cognitive one, and that students are more likely to be motivated by using the new language in practical contexts – for example, solving a problem or carrying out a task together. Supporters of this approach include eminent researchers such as Rod Ellis[3] and Michael Long.[4]

Whatever the theoretical viewpoint, one thing is certain: 'knowledge' in language learning is not the same as 'knowledge' in, say, history. Linguistic skill derives from having a well-established tacit 'mental representation' (procedural knowledge) of the grammar, vocabulary and discourse rules of a language. 'Knowing *how*' is far more important than 'knowing *that*'. So the challenge for language teachers is how to help this mental representation to develop. As any language learner knows, it takes lots of exposure, time and practice.

With this in mind, teachers may be well advised (in the absence of precise research-supported models of 'what works') to hedge their bets by doing two things: 1) Exploit natural acquisition mechanisms by using as much of the target language as possible in meaningful and interesting ways, involving listening, speaking, reading and writing; and 2) Exploit the gradual acquisition of skills by using a certain amount of explanation and structured practice on high-frequency areas of vocabulary and grammar. In addition, they'd be wise to find out more about the research, question their own beliefs and be sensitive to the precise context they're working in. And they might well take on board some of the more secure findings of research. Here are just a few for the record:

'Knowledge' in language learning is not the same as 'knowledge' in, say, history. 'Knowing *how*' is far more important than 'knowing *that*'.

- Explicit vocabulary instruction can help alongside the incidental learning of words through listening and reading.
- Reducing anxiety helps students learn.
- Error correction can make a difference, but not much.
- Explicitly teaching sound-spelling relationships (phonics) is useful.
- Repetition is vital for acquisition, but not just any repetition – the more meaningful and varied the better.
- Transcription tasks and reading aloud reinforce 'phonological memory'.
- It's often more efficient to teach vocabulary in lexical phrases rather than with isolated words.
- Old-fashioned grammar-translation is generally a poor way to teach a language if you want students to communicate.

Steve Smith is a former Head of Modern Languages, co-author with Gianfranco Conti of *The Language Teacher Toolkit* (available on Amazon), author of *Becoming an Outstanding Languages Teacher* (Routledge) and writer of the widely used French resources website *frenchteacher.net*. He is also a writer and trainer for the AQA awarding body in England, and Visiting Lecturer and Subject Lead Tutor at the University of Buckingham.

Further reading:

Anderson, J. R. (1982) 'Acquisition of cognitive skill', *Psychological Review* 89 (4) pp. 369–406.

Barcroft, J. (2015) *Vocabulary in language teaching*. London: Routledge.

Lightbown, P. M. & Spada, N. (2011) *How languages are learned*. Oxford: Oxford University Press.

REFERENCES

1. Teaching Schools Council (2016) *Modern foreign languages pedagogy review*. Available at: www.bit.ly/2XAkiD1.

2. Krashen, S. D. (1982) *Principles and practice in second language acquisition*. Oxford: Pergamon Press. Also available at: www.bit.ly/2IK0GpR.

3. Ellis, R. (2005) *Instructed second language acquisition: a literature review*. Available at: www.stanford.io/2KEpYrJ.

4. Long, M. H. and Doughty, J. (eds) (2009) *The handbook of language teaching*. Oxford: Wiley-Blackwell.

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:

- Attend a researchED event
- Share your evidence-informed research as a speaker
- Volunteer for a local event
- Donate to researchED

Get in touch

contact@researchED.org.uk
@researchED1
www.researchED.org.uk

researchED

10 THINGS EVERY TEACHER EDUCATOR SHOULD KNOW AND BE ABLE TO DO

Faye Craster

The emergent interest in evidence-informed teaching has, inevitably, led to a growing discussion about the implications this has for how we teach our teachers to teach. Here, Faye Craster, Director of Teacher Development at Teach First, considers what an evidence-informed framework might look like for teacher training and preparation.

Training teachers to be the best they can be as quickly as possible is arguably one of the biggest levers for improving education in any country.

In England, around 25,000 teachers begin initial teacher training (ITT) each year and this requires around the same number of teacher educators[1] working to support them. There are many different routes into teaching and Teach First – a charity which recruits and trains teachers and places them in schools in disadvantaged areas, with the aim of achieving an equal education for all children – works with nearly 2000 school mentors, 160 of our own expert teacher educators and around 100 university tutors. Over the last 16 years we've trained over 10,000 teachers on our programme and our training is rated as 'outstanding' by Ofsted.

One of the biggest barriers to providing effective teacher training (particularly for mentors in schools who are also teaching a pretty full timetable themselves) is that they often don't get the time to consider their own role as *educators of teachers* and what this means in terms of the expertise they need.

What follows is therefore an argument for the ten most important things any teacher educator should know and be able to do. This is based on our work over the past 16 years and we hope it is a helpful starting point for discussion. (You'll be able to find a more in-depth look at each of the ten on the Teach First website: www.teachfirst.org.uk.)

1. Know the science of learning

As a starting point, a meaningful understanding of cognitive science, the science of learning, and (in particular) cognitive load theory should be a fundamental part of any teacher education programme.

Why? Because firstly it ensures trainees are clear what their *primary* purpose is: to alter the long-term memories of their pupils so that the content of their subject is retained (i.e. learnt!). Secondly, having a shared language between trainee teachers and teacher educators for describing what learning is helps when discussing what they are aiming to achieve and why certain pedagogical approaches work better than others.

2. Know the most important substantive and disciplinary knowledge in their domain

The importance of subject knowledge for teacher educators might sound obvious, but it is often underestimated (this applies as much in the primary phase as it does in the secondary phase). *What* we teach (the subject content) is too often the poor relation of *how* we teach (pedagogy). Nor is good pedagogy necessarily generic – the nature of the content of a subject has much bearing on how that content is taught.[2]

In teaching subject content, trainees need to develop an understanding of vital subject content, how to sequence it over time, and what misconceptions pupils are likely to develop and how to overcome them.

3. Know what evidence tells us about good pedagogy

There may not be one clear and agreed model of what good teaching is, but we do have some great literature

which provides a starting point for conversations with trainees, who can often be exposed to dubious pedagogical models. It's our role as teacher educators to select from this literature that which has the best evidence supporting its effectiveness.

A huge benefit of using specific pieces of literature to talk about good teaching is that they provide a common language. In our curriculum at Teach First we use the Rosenshine 'Principles',[3] the Learning Scientists' six effective strategies[4] and Doug Lemov's *Teach Like a Champion*,[5] all chosen because of the evidence base for their effectiveness, and all of which give our participants a common set of reference points when discussing their classroom practice.

4. Know the differences between educating novices and experts

The basics of this are twofold: novices and experts in any domain learn in different ways, and when learning to teach, trainees are novices, so will need a pedagogical approach that reflects this.[6]

There is a very natural tendency to 'treat your trainee how you'd want to be treated' when training them, especially as they are an adult. However, as novices they will benefit from concrete modelling and practice, which probably feels a little uncomfortable at first. A key consideration is that interactions with trainee teachers need to be planned in the same way that lessons for pupils are planned, considering both the knowledge/skill being imparted alongside the most appropriate method of instruction (direct instruction, practice, modelling, coaching etc.).

5. Know the misconceptions trainees may arrive with and how to challenge them

New teachers are likely to arrive with a host of misconceptions about their subject, their pupils and pedagogy – and these will differ significantly for each subject and school phase. Some examples may include overestimating pupils' prior knowledge, assuming that motivation leads to achievement rather than the other way round, or believing in edumyths like learning styles. There will also be subject-specific misconceptions, such as believing that it doesn't matter what pupils read as long as they do read – leading to the choice of *Stone Cold* as a class text instead of the *Iliad*.

Anticipating the more common misconceptions and knowing how to overcome them will speed up trainees' progress as they shed unhelpful ideas and make better decisions as a result.

6. Know how to prioritise and sequence the curriculum for trainees

Trainees cannot hope to develop in all areas at once. For example, curriculum design is something that might come after the basics. Therefore, deciding what to prioritise in a trainee's development, when to move them on and how to identify emerging needs are all vital parts of good training.

At Teach First we initially focus participants on what we call the 'gatekeeper skills' of behaviour management (Teachers' Standard 7), planning (Teachers' Standard 4) and assessment (Teachers' Standard 6), which evidence tells us[7] are key to our participants having the solid basis they need to establish themselves in the classroom.

Knowing the typical sequence in the development of a good classroom teacher (and providing opportunities for this sequenced development) is critically important for all training.

7. Know how to use a structured developmental cycle to support improvements

When trainees are seeking to get better at an aspect of teaching, they are often trying to bridge a gap between theory and practice, or what Daisy Christodoulou calls 'the knowing-doing gap',[8] where a trainee might be able to articulate what to do better but isn't yet able to perform this fluently.

The Teach First curriculum includes the use of a simple yet structured developmental cycle that follows the sequence of 'assess – plan – do – review'. Taken together – and in this order – these steps enable trainees to clarify and prioritise what they need to do to improve. The role of great teacher educators is to guide their trainees through this cycle whilst brokering the support needed throughout.

8. Know how to identify small, concrete, actionable improvement steps

The most complex part of this developmental cycle above is arguably the 'plan – do' stage, which is incredibly hard to do well but vitally important. So, our teacher educators use a more specific framework to help structure

There is a very natural tendency to 'treat your trainee how you'd want to be treated' when training them, especially as they are an adult. However, as novices they will benefit from concrete modelling and practice.

this part of the development cycle. What's critical here is that the trainee has a concrete next step to practise which will develop their knowledge or hone a specific skill.

We use an adapted version of the Bambrick-Santoyo feedback protocol[9] for this, and specifically after observations of lessons. This protocol defines five steps (the 5 Ps) that guide discussions:

- **P**raise strengths
- **P**robe development areas
- Set **P**recise actions
- **P**lan ahead
- **P**ractise based on the plan

Defining precise actions and planning for their completion makes it vastly more likely that trainees will complete them (e.g. 'Plan the questions you will ask following the starter activity in your Year 9 lesson on Tuesday' vs 'Plan some questions before your lessons'), and thus improve. Ensuring they practise with an expert as part of this cycle further ensures progress (see no. 9 below).

9. Know how to lead deliberate practice[10]

The final stage of the 5 Ps protocol (in no. 8) is practice, which we believe is one of the most transformational elements in the teacher educator's toolkit. Practising specific teaching techniques, with clear criteria for what 'good' looks like, modelled by an expert teacher educator who can provide focused feedback is the key ingredient in closing the 'knowing-doing' gap highlighted in no 7.

Whether it is a behaviour technique, explanation of a concept or a telephone call with a parent – practice helps. Practising techniques until they can be performed fluently frees up space in working memory for trainees, allowing them to turn their attention to everything else they will encounter in their lessons.

7–9 in this list are inextricably linked in how we use them at Teach First, but that isn't a requirement. You can separate them to focus on one particular approach rather than bringing them together.

10. Know how to support trainees' wellbeing by advocating evidence-informed practices

Considerations of teacher workload are high on the agenda in education right now and we believe basing our ITE curriculum on what research and evidence currently tells us about effective curriculum, learning and pedagogy will reduce workload and support trainees' wellbeing.

Teachers work hard and are generally happy to do so, as long as they can see their efforts benefiting pupils. Unsurprisingly, it often takes trainees longer to do anything (planning, marking) compared to more experienced teachers, meaning their workload is initially heavier. Therefore, selecting appropriate evidenced-based practices reduces workload and supports wellbeing. For example, if teachers are exposed to the science of learning they will spend more time doing things that are effective (such as breaking content down into manageable chunks), and less time on things that add no value, or that may actually distract their pupils from the content they're learning (like making pretty PowerPoint animations).[11]

Summary

Too often, what it takes to be an outstanding teacher educator is taken for granted. We assume excellent teachers will make brilliant teacher educators. Often they do. But at Teach First we believe the role requires specific knowledge and skills, and that ensuring every one of our participants has a teacher educator with these attributes is too important to be left to chance. This list of knowledge and competencies is by no means exhaustive, but it represents what we consider to be the critical few that will enable teacher educators to drive development in their trainees and make them, quickly, into the great teachers that our young people need.

REFERENCES

1. We're taking this term to include in-school mentors as well as tutors employed by the ITT provider.

2. www.bit.ly/31ep8Ic (accessed 27 March 2019).

3. Rosenshine, B. (2012) 'Principles of instruction: research-based strategies that all teachers should know', *American Educator* 36 (1) pp. 12–19, 39. Available at: www.bit.ly/2Kw17qg.

4. Learning Scientists, 'Six strategies for effective learning'. www.bit.ly/2XwIDtk (accessed 26 March 2019).

5. Lemov, D. (2015) *Teach Like a Champion 2.0: 62 Techniques That Put Students on the Path to College*. San Francisco, CA: Jossey-Bass.

6. Berliner, D. C. (1988) 'The development of expertise in pedgagogy', Charles W. Hunt Memorial Lecture presented at the Annual Meeting of the American Association of Colleges for Teacher Education (New Orleans). This insight about novices and experts is, of course, applicable to the pupils we teach too. It provides a critical paradigm for how we organise our instruction in the classroom, and links to the first three items above.

7. *The next move: delivering a world-class leadership development and teacher training programme* (Teach First internal report, 2016).

8. www.bit.ly/2IpqR4C (accessed 29 March 2019).

9. Teach First has adapted the feedback model first drawn up by Paul Bambrick-Santoyo, MD of Uncommon Schools in the USA. His work on teacher coaching and feedback is best summarised in Bambrick-Santoyo, P. (2010) *Driven by data: a practical guide to improve instruction*. San Francisco, CA: Jossey-Bass.

10. Ericsson, K. A., Krampe, R. T. and Tesch-Roemer, C. (1993) 'The role of deliberate practice in the acquisition of expert performance', *Psychological Review* 100 (3) pp. 363–406.

11. See www.bit.ly/2WO36MR (accessed 29 March 2019).

MYTH-BUSTING

THERE IS SOME TRUTH IN EVERY LIE #3: DIGITAL NATIVES

Dr Pedro de Bruyckere

In the third article in this ongoing series, Dr Pedro de Bruyckere skewers another common educational myth. This issue: 'Children are digital natives.'

One of the first myths I've ever factchecked was the idea of digital natives, a term coined in 2001 by Marc Prenzky.[1,2] What is the basic idea? Young people are born in a digital world and are very good at using technology, and so are digital natives. One the other hand, most of their parents are really bad at using technology, and so are called digital immigrants. (And no, they don't have to leave the country – yet.)

And there appears to be some truth in it, because whenever I ask teachers or parents if they ever needed some help from a younger person with technology, most of them nod in shame. So on the surface it does seem that our children are better at using technology.

Well, as always, it's a bit more complicated than that. First of all, there are two myths underneath the idea of the digital native:

- Kids and youngsters are good at using technology.
- Other generations aren't that good.

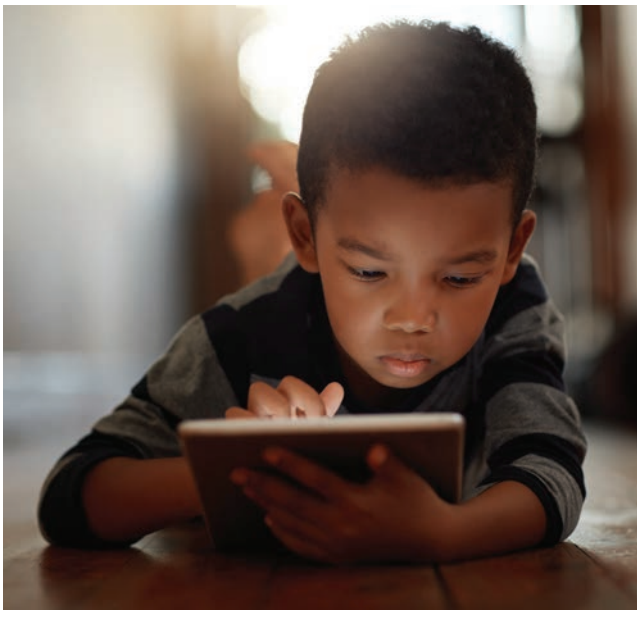
Paul Kirschner and I wrote a large article[3] reviewing the evidence for this concept since 2001, and found that both ideas are wrong:

- Information-savvy digital natives do not exist.
- There is no relationship between age and internet know-how.

Research by Hargittai[4,5] shows that it is actually higher income and higher education that are related to being better at technology and using online information.

But wait – why do we need their help when we're stuck, then? Well, because we need to make a distinction between 'operating the buttons' on one side and 'strategic and information skills' on the other side. And it seems that in relation to figuring out how technology works then 'the younger the better' seems to be the rule with preschoolers – even beating grad students.

But when discussing the use of technology for strategic purposes or to get information from online sources, then those so-called digital natives are often really bad at it. McGrew et al.[6] checked this with children and students from middle school, high school, and colleges in 12 states. Across tasks and grade levels, students struggled to effectively evaluate online claims, sources, and evidence.



What does this mean for teachers and schools? Well, a few things:

1. The claim that 'digital natives exist' can never be used a basis for designing education.
2. Knowing that this claim is false is a good reason to teach strategic competences, ensure sufficient knowledge to be able to factcheck online information, etc.
3. Conversely, abolishing technology completely from schools is as extreme and unproductive as thinking technology will change education dramatically. Children and students need to be taught how to work with technology wisely.

I also think it isn't a mistake if a teacher asks help from their students with the 'buttons'. Make them your chief technology officer (CTO), but do remember that those students need a CEO in their learning process – and that is you.

Further reading:

Lucas, C. G., Bridgers, S., Griffiths, T. L. and Gopnik, A. (2014) 'When children are better (or at least more open-minded) learners than adults: developmental differences in learning the forms of causal relationships', *Cognition* 131 (2) pp. 284–299.

REFERENCES

1. Prensky, M. (2001) 'Digital natives, digital immigrants', *On the Horizon* 9 (5), pp. 1–6. Available online at: www.bit.ly/2EXaGe5.

2. Prensky, M. (2006) *Don't bother me Mom – I'm learning!* New York, NY: Paragon House.

3. Kirschner, P. A. and De Bruyckere, P. (2017) 'The myths of the digital native and the multitasker', *Teaching and Teacher Education* 67 (1) pp. 135–142.

4. Hargittai, E. and Hinnant, A. (2008) 'Digital inequality differences in young adults' use of the internet', *Communication Research* 35 (5) pp. 602–621.

5. Hargittai, E. (2010) 'Digital na(t)ives? Variation in internet skills and uses among members of the "net generation"', *Sociological Inquiry* 80 (1) pp. 92–113.

6. McGrew, S., Breakstone, J., Ortega, T., Smith, M. and Wineburg, S. (2018) 'Can students evaluate online sources? Learning from assessments of civic online reasoning', *Theory & Research in Social Education* 46 (2) pp. 165–193. Also: Wineburg, S. and McGrew, S. (2017) 'Why students can't google their way to the truth', *Amass* 21 (3) pp. 38–40.

THE DYSLEXIA DEBATE AND ITS RELEVANCE TO PROFESSIONAL PRACTICE

Professor Julian Elliott

Dyslexia is one of the most well-known, but possibly least understood difficulties facing students. Here, Professor Julian Elliot, Principal of Collingwood College and Professor of Educational Psychology at Durham University, lays out the key ideas every teacher should know.

Introduction

Sarah is a ten-year-old girl reading at the level of a typical six-year-old. She has morphed from a happy, energetic girl who used to look forward to attending school to an anxious, dispirited youngster who longs for the holidays. Her worried parents wonder whether she might be dyslexic and take her for an assessment by a reading specialist. After conducting a series of cognitive tests, parents receive confirmation that, yes, Sarah has dyslexia. The parents are overjoyed as, at last, a skilled diagnostician has seemingly finally got to grips with their daughter's problem. At last it should now be clear how she can best be helped. And at last, Sarah should receive the resources and sympathetic understanding she requires.

Unfortunately, these beliefs are misguided and not supported by the scientific research literature. In this piece I shall try to outline the background reasons for these misunderstandings and explain why current approaches to diagnosing dyslexia are inequitable. While the dyslexia movement is largely motivated by well-meaning and committed people, their focus on a small number of struggling readers undermines the needs and potential of a greater majority with very similar – if not greater – difficulties.

An effective rhetorical device to overcome an unwelcome argument is to reframe it in such a way that it becomes easily challenged. In responding to my criticisms about the value of the term 'dyslexia',[1,2,3,4,5,6] many have sought to express my position as asserting that dyslexia doesn't exist. To refute this argument, one then only needs to point to children like Sarah and ask accusingly (and sometimes with a strong hint of irony) whether their problems and challenges should be considered as non-existent. Not only does the 'non-existent' argument fly in the face of what can be observed, it also would appear that the holders of such views are insensitive to the distress that such children routinely experience. In reality, the dyslexia debate[1] is not about the existence or otherwise of dyslexia but, rather, whether a dyslexia diagnosis has scientific validity. If it is not used in a clear and meaningful fashion, then the term, its operationalisation, and its consequences for professional practice are likely to be highly problematic.

Defining and diagnosing dyslexia

A key point, and one that undermines the whole dyslexia diagnosis industry, is that most leading reading scientists (and also geneticists, neuroscientists, and cognitive scientists) use the term 'dyslexia' as a synonym for severe difficulty with reading. (Note: here, as throughout this article, 'poor' or 'struggling' reading refers to difficulties of decoding text, not reading comprehension – although, of course, the latter is highly dependent on the former) Thus, Peterson and Pennington[7] state that:

> Dyslexia is mainly defined as the low end of a normal distribution of word reading ability … Thus, in order to diagnose the disorder, a somewhat arbitrary cutoff must be set on a continuous variable. (p. 285)

Similarly, in what is widely considered to be a state-of-the-art text, Seidenberg[8] states:

> Dyslexics are children (and later adults) whose reading is at the low end of a normal distribution. Reading skill results from a combination of dimensional factors (that is, ones that vary in degree), yielding a bell-shaped curve. The reading difficulties of the children in the

> lower tail are severe and require special attention. 'Dyslexia' refers to these children. Viewed this way, dyslexia is on a continuum with normal 'reading'. All children face the same challenges in learning to read but dyslexics have more difficulty with the essential components. (pp. 156–157)

For some, dyslexia cut-off points on the reading ability continuum may be determined on the basis of administrative needs and resources:

> Dyslexia is just another name for poor reading … Where you put the cut off between dyslexia and normal reading has to be agreed within your education system, your school – it could be a national policy, a policy within a local authority – there isn't any gold standard.[9]

It is perhaps unsurprising, therefore, that the suggested prevalence of dyslexia in school-age populations can range from as low as 5% to as high as 21%. The picture is muddied not only by where on the normal distribution one would select a cut-off point but also by the unwillingness of many practitioners to view dyslexia in this way. Of course, there are some whose literacy difficulties can easily be explained by other factors (e.g. severe hearing loss or visual impairment, profound intellectual disability, or non-attendance at school alongside highly impaired home education) but these problems are highly salient and not relevant to the core issues in the dyslexia debate.

In the world of clinical practice, many do not accept dyslexia as 'merely' a synonym for reading disability. The widely held belief in such circles is that, presented with a struggling reader, one needs to undertake a series of cognitive tests to ascertain whether or not the person is dyslexic. This obviously implies that only some struggling readers have this condition. Immediately, and crucially, this represents a serious break between majority understandings in the scientific literature and the beliefs and practices of those who are eager to perpetuate this distinction.

So how do clinicians who hold to the notion of a dyslexic subgroup of poor readers identify which poor readers can be considered dyslexic? Certainly not by drawing upon our rapidly developing knowledge in genetics and neuroscience. While the potential of these fields for education is promising, neither can offer insights that can assist practitioners in differential assessment or intervention for those with a reading difficulty (for detailed consideration of this issue, see note 1). Of course, in addition to weak reading skills, many diagnosticians, as noted above, look for cognitive symptoms from an often lengthy list (e.g. poor phonological awareness, impaired rapid naming, inefficient and limited working memory, difficulties of attention and concentration, psychomotor weaknesses, etc). The difficulty here is that such symptoms are typically features of poor readers generally, and there is no justification for using any of these to create a bifurcated split between dyslexic and non-dyslexic poor reader groups.

Historically, another key criterion was a discrepancy between reading ability and IQ; and despite conclusive scientific refutation of the value of this distinction and recognition of this by most professional bodies, many practitioners in the UK and around the world continue to employ it. Of course, we need to give thought to the reasons why diagnosticians continue to use a procedure that has been demonstrably refuted by science yet is widely desired by the great majority of those who are seeking the assessment.

It is quite clear that there are no justifiable criteria for determining a dyslexic subgroup within a wider pool of struggling readers.

> The critical question in dyslexia research is not whether dyslexic people in particular differ from 'normal' readers … It is *whether dyslexic people differ from other poor readers*.[10] (Emphasis as in the original.)

It is quite clear that there are no justifiable criteria for determining a dyslexic subgroup within a wider pool of struggling readers. Current practice, in which a dyslexia diagnosis is based on the presence of certain symptoms or features, maintains false and misleading understandings that sustain a large dyslexia assessment industry that leads to gross inequities of provision.

The relationship of a dyslexia diagnosis to intervention.

The fictional case of Sarah above reports a parental belief that a dyslexia diagnosis will point directly to appropriate, specialised intervention. Again, this represents a potentially serious misunderstanding. Here it is important to highlight the fact that there is no evidence to suggest that a dyslexic poor reader requires a form of assistance different from, or additional to, other (non-dyslexic) poor readers.

Research has clearly and conclusively demonstrated that non-educational approaches often vaunted for those diagnosed as dyslexic (e.g. brain training, audiological processing training, visual therapies of various kinds, and psychomotor programmes) do not have scientific support and should not be utilised. The only form of intervention, to date, that appears effective for struggling decoders is that which utilises systematic and highly structured phonics teaching within a broader range of literacy activities. Interestingly, even those who are eager to maintain the use of dyslexia assessments and diagnoses will rarely take issue with the assertion that there is no special treatment for dyslexic individuals that is not equally valuable for other struggling readers. Yet, in the dealings of some practitioners with teachers and families, such a distinction is often implied.

Inequities of provision

Perhaps the most passionate argument put forward by the proponents of dyslexia diagnosis is that this can prove highly valuable to the individual concerned. Let us ignore, for the moment, the conceptual and scientific flaws in the diagnostic process, and consider the issue of benefit independently. According to proponents, a diagnosis of dyslexia can bring succour to the individual and their family, greater understanding, sympathy and patience from school staff and peers, modifications and adjustments to academic demands (including examination procedures) and, in some cases, extra resources in the form of equipment or special tuition/schooling.

Many dyslexic individuals state that, prior to their diagnosis, they had considered themselves to be stupid, or were frustrated that others had thought this of them, or that they were lazy – clearly, the diagnosis can have the effect of reducing negative, pejorative attributions that can help the struggling reader and their families. The difficulty is that if it takes a dyslexia diagnosis to effect positive outcomes of this kind, what are the implications for the many thousands of struggling readers who do not receive this label? Is it not likely that, in a zero-sum game, the 'non-dyslexic' poor readers are more likely to be seen in a negative light? Will this latter group be considered to comprise those of questionable intellectual ability, those who are not prepared to work, or the offspring of feckless, uncaring parents with no regard for learning?

Of course, such a distinction is wholly fatuous. In actuality the dyslexia label is most likely to be applied, not to more worthy, or more unfortunate, individuals, but rather to those whose families have the drive – and, in many cases, the financial means – to gain access to a diagnostician. Rarely, it seems, will a struggling reader fail to receive the dyslexia label if a private consultation has been undertaken. However, it is one thing to use one's private resources to gain a diagnosis; it is quite another to then expect others to pay the costs of additional educational inputs that are contingent upon this. Thus, the parents of diagnosed children sometimes seek funding from local authorities for their children to access specialist independent schooling. Some who are refused this subsequently apply to have their child's case heard by an SEN tribunal. The fact that there may be many thousands of children with far greater literacy difficulties in the local area does not necessarily deter tribunals from ruling against local authorities and mandating the expenditure requested. To avoid the costs of defending their position and any negative publicity that results, local councils sometimes give in to parental requests and provide often substantial funding without the case going to the tribunal hearing. Of course, one has sympathy for desperate parents, but the costs of these isolated cases reduce the wider support that can be offered to large numbers of other children.

Concluding remarks

What we need are education systems that are able to identify and intervene with all struggling readers as early as possible. The nature and level of support provided should be a function of the response that the child demonstrates as a consequence of intervention. Additional resources are applied where earlier forms of intervention appear insufficiently powerful. With such an approach, known in the special education field as response to intervention, there is no need for a dyslexia diagnosis or the deployment of the wait-to-fail model upon which these are typically based.

Of course, where there are finite resources, there will typically be winners and losers. Currently, the winners are those who can acquire a dyslexia diagnosis and gain the various benefits that proponents cite to justify the continuance of this approach. The losers are the other struggling readers, often already disadvantaged in other aspects of their lives, for whom the perceived benefits of any such diagnosis are not forthcoming. The dyslexia assessment industry sucks up resources and reduces the opportunity for school systems to operate more equitable and effective response to intervention models. It also reduces pressure upon the state to recognise and address the needs of huge numbers of children whose poor reading skills impede their life chances. We need to address this problem as a matter of some urgency. While frequently criticised for my stance, I make no apologies for attacking the use of dyslexia diagnoses on conceptual, scientific, social and ethical grounds.

Email: joe.elliott@durham.ac.uk

REFERENCES

1. Elliott, J. G. and Grigorenko, E. L. (2014a) *The dyslexia debate*. New York, NY: Cambridge University Press.

2. Elliott, J. G. and Grigorenko, E. L. (2014b) 'The dyslexia debate', *The Psychologist* 27 (8) pp. 576–580.

3. Elliott, J. G. (2015a) 'The dyslexia debate: actions, reactions, and over-reactions', *Psychology of Education Review* 39 (1) pp. 6–16

4. Elliott, J. G. (2015b) 'The author's response to peer commentary', *Psychology of Education Review* 39 (1) pp. 35–36.

5. Elliott, J. G. and Resing, W. C. M. (2015) 'Can intelligence testing inform educational intervention for children with reading disability?', *Journal of Intelligence* 3 (4) pp. 137–157.

6. Elliott, J. G. and Nicholson, R. (2016) *Dyslexia: developing the debate*. London: Bloomsbury Press.

7. Peterson, R. L. and Pennington, B. F. (2015) 'Developmental dyslexia', *Annual Review of Clinical Psychology* 11 (1) pp. 283–307.

8. Seidenberg, M. (2017) *Language at the speed of sight: how we read, why so many can't, and what can be done about it*. New York, NY: Basic Books.

9. Snowling, M. J. (2013) *Dyslexia: an impairment of language learning*. British Psychological Society/British Academy Lecture. (Reported in *The Psychologist* 26, pp. 786–795).

10. Rice, M. and Brooks, G. (2004) *Developmental dyslexia in adults: a research review*. London: National Research and Development Centre for Adult Literacy and Numeracy, UCL Institute of Education.

TIME TO LET GO?
THE DIFFICULTIES OF SIMPLE CONCLUSIONS FROM ATTACHMENT THEORY

Dr Niklas Serning

In the quest to understand student behaviour, it is natural and understandable to explore every avenue we can to find answers. Dr Niklas Serling counsels caution when it comes to the current interest in attachment theory as an explanatory – and prescriptive – model from which to draw conclusions.

At a time when pupil behaviour is driving teachers out of their vocation and exclusions are under increasing scrutiny by the press, how best to manage challenging behaviour is a subject of heated debate. Some educationalists have pointed to attachment theory as a useful way of understanding and dealing with challenging behaviour.[1,2,3] Teaching on a counselling psychology doctorate, I come across attachment theory a great deal. I also started my career as a psychologist by setting up a counselling service in a pupil referral unit (PRU), where I am now a governor. I know what challenging behaviour looks like, and have some understanding of the struggles of the children and young people exhibiting it.

The children who leave mainstream education for PRUs have often had many significant adverse experiences that contribute to their struggle with the demands of mainstream education. The focus on their individual needs that a good PRU can offer (and many are doing an excellent job with incredible staff) is often a better fit than a busy mainstream classroom with overstretched staff. In the current discourse on behaviour, the sorts of adverse childhood experiences that some children bring to PRUs are often interpreted through attachment theory.[4] This, as part of a broader therapeutic turn in some elements of educational academia, imports theories from psychology to mainstream teaching practice.

There are two problems with this. The first is to conflate the experience of very vulnerable children with a history of familial abuse or neglect with a broader population, seeking evidence of trauma on a spectrum where it is often not merited. The second problem is that many psychological theories invoked as scientific evidence for a particular approach to counselling and education have turned out, on further evaluation, to not be as convincing as those propounding them might like.[5] The public discussion has become increasingly ungrounded in its portrayal of attachment theory as a scientific evidence base for both aspects of the query. My objective in this article is to give a more balanced view.

Many psychological theories invoked as scientific evidence for a particular approach to counselling and education have turned out to not be as convincing as those propounding them might like.

Attachment theory is a body of theories from the 1960s that has accrued much criticism over the years.[6] Originating with Freud's theories, we form an attachment to our primary caregiver, and then supposedly proceed to assume that our future connections will be like that.[7] If we had a difficult attachment to our mum, we will have a difficult attachment to our teacher. We won't be able to rely on the teacher since we couldn't rely on our mum, and may indeed take out our anger at our mum on our teacher.[8] Broadly placed in the psychodynamic tradition where the focus is on early experience in the family, and much emphasis is on how unconscious constructs drive our behaviour, 20th-century research into attachment theories attempted to solidify and ground ideas such as internal working models of our parents in scientific laboratory tests, using experiments like the 'strange situation'.[9]

The results of these experiments were far less supportive of psychodynamic theories than we may think today. The 'strange situation' (where a child is with its mother in a room, left and subsequently re-joined by her, and the child's behaviour and reaction to the mother's return) is seen as an indication of how secure their attachment to their mum is – and shows exactly and only that. It does not show how secure the attachment may be to others – strangers still scare the child.[9,10] The way that children relate to their mothers does not serve as a predictable blueprint for how they relate to the world.[11,12] It seems that we don't have a fixed attachment style that we generalise to all – we relate differently to different people.

In defence of psychodynamic and attachment theories, we must acknowledge that these theories were constructed long before large-scale genetic data was available. We now know from behavioural genetics – a field with far more convincing and replicable data – that the impact of parenting, outside the most extreme cases of neglect and abuse, is very limited.[13,14,15] Extensive research conducted on personality and genetics over the past 50 years in several countries shows that persistent, generalised internal models of caregivers do not form the basis for personality.[16] Genetic twins separated at birth and raised by very different parents are much more similar than genetically unrelated adopted siblings raised by the same parents.[17,18,19]

In order for attachment theory to have any credibility, it would have to show that the way we related to our parents affects how we now relate to other people. Such a study has never been done. It would have to control for genetics since children will relate to others in similar ways that their parents related to others, since children and parents share genes (it is understandable that attachment theorists mistook this correlation for causation). A child could have a calm and caring relationship with their mother, and subsequently such a relationship with others, all due to shared genetics.[20]

It may seem intuitive to us that parental attachment forms future relational strategies but there is no evidence for it in the general population. Indeed, given our vast cognitive capacities, and given that most of these capacities focus on social interaction, it doesn't make sense for us to have such a fixed take on relationships,

The best approach for the vast majority of children is to create an environment that makes it clear what is expected of them, and then to enforce these expectations. Trust the ability of children to adapt.

trust and connection. Compared to other animals, we are uniquely skilled at social engagement – we try to mind-read and adapt in a useful way to each specific person we meet. We differentiate between people – we can have trouble with our dad, yet still have a good relationship with our friend. We learn how other people are, not only from our parents, but from peers and relations throughout our lifespan. The evidence is clear that humans are experts at adapting differently to different people.[21] Even if some children with actively harmful caregivers may deduce from their adverse experiences that *all* people are bad, we can concentrate our resources better on those genuinely vulnerable children and make better decisions concerning how best to manage the rest if we do not extrapolate from the extremes to define the vast majority.

We are a supremely social, adaptable and resilient species. Human beings have adapted to savannahs and deserts – even the Arctic Circle, where my mother is from. We have adapted to living as hunters, gatherers, farmers and software engineers – the vast majority of us can adapt to the classroom. The question is how best to create an environment to support and reinforce our plasticity and resilience. While not conclusive, some evidence seems to show that the consistent approach to behaviour in schools that some might consider to be 'strict' in character might lead not only to better academic outcomes but also to greater wellbeing for pupils and teachers alike.[22] It closes the attainment gap, so that pupils from groups that might otherwise be left behind do better across the board. If you want better outcomes for kids on free school meals, the evidence is that kind consistent behaviour management systems and high expectations work.[23] If we allow children to punch their teacher because we imagine that their difficult attachment to their mum makes them destined to do so, we make it quite likely that they will fail to adapt to a school environment that could otherwise have assisted in socialising and educating them to have far better life chances. It also prevents everyone from learning and teaching in peace without the stress and anxiety of disruption and violence. If it sounds oppressive to walk down a corridor in silence, how oppressive is it to walk down a corridor in fear of being verbally harassed or physically assaulted?

The best approach for the vast majority of children is to create an environment that makes it clear what is expected of them, and then to enforce these expectations.[24] Trust the ability of children to adapt – just like they adapt and are different on the football field, with their grandparents, at weddings, with their cousins or sitting in the car. The most controversially traditionalist state school in England, Michaela Community School, does not apply SEND labels and applies the same behavioural standards to all children while providing additional learning support specific to their needs, and was praised by Ofsted for their 'exceptional' SEND progress in a report that described the school's approach to pupil development and welfare as 'outstanding'.[25]

As a school governor with two children, I end up in many discussions with parents about their children's struggles in which the explanatory model parents use to try and understand those issues is often some form of attachment theory. There is a real danger for the child here – questionable attachment theories make parents see their children acting out as evidence of them being in need of special treatment, instead of focusing on teaching the child to adapt. With loose boundaries, the child is confused, acts out more, and is further stigmatised socially. In cases where parents can't create firm boundaries, a school that does can make the difference for a child who might otherwise run the risk of perpetually struggling socially and suffer the negative impacts of loneliness and conflict that can bring. Paradoxically, if we see all struggles as indications of attachment difficulties and deny the ability of the child to push through these struggles, we will make children adapt to these lesser expectations and adopt this story.

But what to do with the small minority that don't manage to adapt despite this clarity? The ones who for whatever reason – extreme trauma, neurology – struggle to fit in? My work at the counselling service at the pupil referral unit allowed me to get to know these children well. We need to accept that some children – fewer than we perhaps think but still some – won't fit mainstream education and that we need to adapt to them. Extraordinary kids demand extraordinary interventions – one of my more memorable days at work included a very useful therapeutic session with a teenage boy who I was physically restraining for his own safety on top of a bus. Overall, however, my experience has shown me that successes at the PRU were more often in finding a useful outlet for the young person's skills, rather than any therapeutic interventions. Therapy could be useful in examining life choices, teaching awareness and skills, but rarely would focus on supposed childhood trauma or indeed attachment difficulties be useful. These

pupils needed a guide and mentor to navigate this difficult world of rules they struggled to adhere to, rather than someone to 'cure' their childhood. Childhood was over; now the focus was to get on to the best of their abilities, and with that focus it was possible to succeed.

It is therefore with great concern that I see recent policies forcing schools to designate attachment-trained teachers,[26] and NICE guidelines deploying attachment theory as an accepted truth.[3] These are in no way uncontested facts; they are poorly supported theories that will ultimately draw resources from schools – resources that could be far better used. The troubled child will be well served by having a designated adult that they can rely on, because care works, and space is useful; but training this supportive staff person in attachment theory – or indeed insisting that the entire teaching body adheres to it – is deeply problematic. It denies and stifles the adaptability and resilience that children would be better off developing to thrive in the outside world.

Dr Niklas Serning is the consultant child psychotherapist for Bristol's award winning OTR where he led a service transformation focused on resilience and empowerment. He is also a senior lecturer and Systemic Module Leader at UWE's counselling psychology doctorate, a governor in both mainstream and pupil referral schools, and father of two. His MSc research relied heavily on attachment theory – we all make our mistakes.

niklas@serning.com
www.serning.com
@NServing

REFERENCES

1. Cozolino, L. (2013) *The social neuroscience of education: optimizing attachment and learning in the classroom*. London: Norton & Co.

2. Geddes, H. (2006) *Attachment in the classroom: the links between children's early experience, emotional well-being and performance in school*. London: Worth.

3. NICE (2015) *Children's attachment: attachment in children and young people who are adopted from care, in care or at high risk of going into care*. Available at: www.nice.org.uk/guidance/ng26.

4. Bombèr, L. M. (2011) *What about me? Inclusive strategies to support pupils with attachment difficulties make it through the school day*. London: Worth.

5. Kagan, J. (2012) *Psychology's ghosts: the crisis in the profession and the way back*. New Haven, CT: Yale University Press.

6. Tizard, B. (2009) 'Looking back: the making and breaking of attachment theory', *The Psychologist* [Website]. British Psychological Society. Available at: www.bit.ly/2XHnjBy.

7. Bowlby, J. (1988) *A secure base: parent-child attachment and healthy human development*. London: Routledge.

8. Verschueren, K. and Koomen, H. (2012) 'Teacher-child relationships from an attachment perspective', *Attachment & Human Development* 14 (3) pp. 205–211.

9. Ainsworth, M. and Bell, S. (1970) 'Attachment, exploration, and separation: illustrated by the behavior of one-year-olds in a strange situation', *Child Development* 41 (1) pp. 49–67.

10. Kagan, J., Reznick, J., Clarke, C., Snidman, N. and Garcia-Coll, C. (1984) 'Behavioral inhibition to the unfamiliar', *Child Development* 55 (6) pp. 2212–2225.

11. Mischel, W. (1996) *Personality and Assessment*. Mahwau, NJ: Erlbaum.

12. Davila, J., Burge, D. and Hammen, C. (1997) 'Why does attachment style change?', *Journal of Personality and Social Psychology* 73 (4) pp. 826–838.

13. Oliver, B., Trzaskowski, M. and Plomin, R. (2014) 'Genetics of parenting: the power of the dark side', *Developmental Psychology* 50 (4) pp. 1233–1240.

14. Pike, A., McGuire, S., Hetherington, E. M., Reiss, D. and Plomin, R. (1996) 'Family environment and adolescent depressive symptoms and antisocial behaviour: a multivariate genetic analysis', *Developmental Psychology* 32 (4) pp. 590–603.

15. Plomin, R. (2018) *Blueprint*. London: Penguin Books.

16. Polderman, T., Benyamin, B., de Leeuw, C. A., Sullivan, P. F., van Bochoven, A., Visscher, P. M. and Posthuma, D. (2015) 'Meta-analysis of the heritability of human traits based on fifty years of twin studies', *Nature Genetics* 4 (1), pp. 702–709.

17. Knopik, V. S., Neiderhiser, J. M., DeFries, J. C. and Plomin, R. (2017) *Behavioral genetics*. 7th edn. London: Worth.

18. Loehlin, J. C., Horn, J. M. and Willerman, L. (1989) 'Modeling IQ change: evidence from the Texas Adoption Project', *Child Development* 60 (4) pp. 993–1004.

19. Rimfield, K., Kovas, Y., Dale, P. S. and Plomin, R. (2016) 'True grit and genetics: predicting academic achievement from personality', *Journal of Personality and Social Psychology* 111 (5) pp. 780–789.

20. Harris, J. (2010) *No two alike*. New York, NY: Norton.

21. Tomasello, M. (2014) 'The ultra-social animal', *European Journal of Social Psychology* 44 (3) pp. 187–194.

22. Bennett, T. (2017) *Creating a culture: how school leaders can optimise behaviour*. Department for Education. London: The Stationery Office. Available at: www.bit.ly/2XBrOxn.

23. Gregory, A., Cornell, D., Fan, X., Sheras, P. Shih, T., Huang, F. (2010) 'Authoritative school discipline: high school practices associated with lower student bullying and victimization', *Journal of Educational Psychology* 102 (2) pp. 483–496.

24. Haydn, T. (2014) 'To what extent is behaviour a problem in English schools? Exploring the scale and prevalence of deficits in classroom climate', *Review of Education* 2 (1) pp. 31–64.

25. Ofsted (2015) *Inspection report: Michaela Community School*. Available at: www.bit.ly/2EVIpoj.

26. Department for Education (2015) *The designated teacher for looked-after and previously looked-after children*. London: The Stationery Office. Available at: www.bit.ly/2EZVZXE.

researchED

UPCOMING EVENTS

Be part of the evidence evolution in education

- Saturday conferences
- Affordable ticket prices
- World-class speakers
- Teacher-led
- Open to all

Join our community at one of our conference days where you can hear, challenge and question experts in education research – from the classroom to the university. Work out what works for you – and when.

Event	Date
researchED Melbourne	24 August 2019
researchED London National Conference	7 September 2019
researchED Dublin	5 October 2019
researchED Northampton	5 October 2019
researchED Surrey	19 October 2019
researchED Rome	26 October 2019
researchED Philadelphia	16 November 2019
researchED Ipswich	16 November 2019
researchED Haninge	14 March 2020

Find out more at **researchED**.org.uk

See website for details, dates subject to change

DO YOU WANT TO SPEAK AT A researchED EVENT?

Are you doing research in your classroom or school? Do you want to share your knowledge at a **researchED** event? Keep reading to find out more.

Our mission

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.

What we are looking for

We are looking for speakers who can deliver sessions that further those aims. We welcome submissions from anyone with something to say about the field of evidence in education that is:

- Interesting
- Useful
- Important
- Evidence-based

We welcome submissions from speakers from many areas of education: newly qualified teachers, academics, policy makers, researchers, statisticians, MRI operatives… anyone who can deliver something that meets at least some of the criteria above.

Submit your session online at:
researchED.org.uk/session-submissions

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.

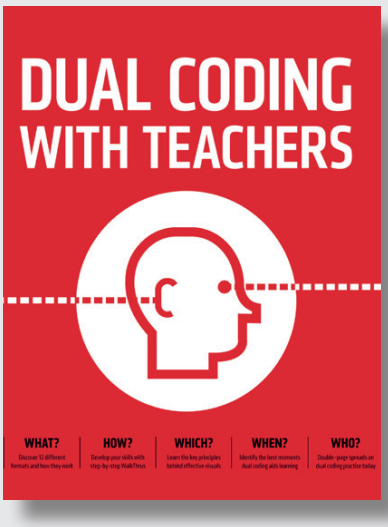
We ask that all speakers be prepared to discuss their evidence bases with their audiences if asked to do so. How do you know what you claim? Obviously the definition of evidence bases will vary from session to session, but we do not solicit sessions that represent the speaker's opinion alone without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

NEW BOOKS FROM JOHN CATT



DUAL CODING WITH TEACHERS

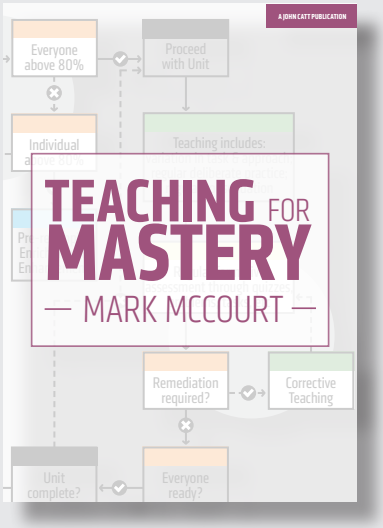
Oliver Caviglioli

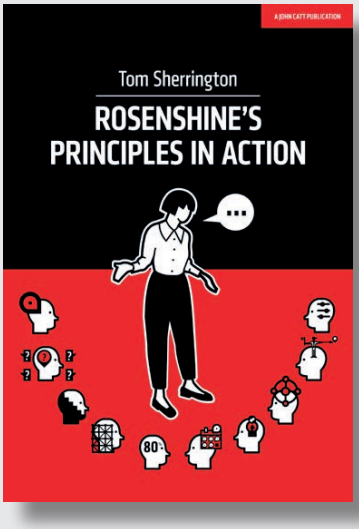
As part of the discovery of cognitive science, teachers are waking up to the powers of dual coding - combining words with visuals in your teaching. But cognitive scientists aren't graphic designers, and so their books don't show teachers how to be competent in producing effective visuals. Until now.

TEACHING FOR MASTERY

Mark McCourt

There are many models of schooling; some work, some don't. Mastery is an entire model of schooling with over 100 years of provenance, its impact has been researched for decades, with many of the world's greatest education minds testing and refining the approach. It's one of the models of schooling that actually works.





ROSENSHINE'S PRINCIPLES IN ACTION

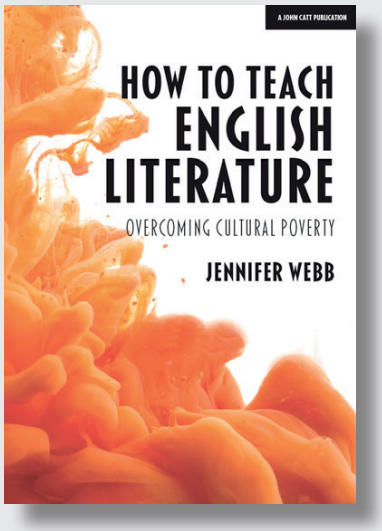
Tom Sherrington

Barak Rosenshine's Principles of Instruction are widely recognised for their clarity and simplicity and their potential to support teachers seeking to engage with cognitive science and the wider world of education research.
In this concise new booklet, Rosenshine fan Tom Sherrington amplifies and augments the principles and further demonstrates how they can be put into practice in everyday classrooms.

HOW TO TEACH ENGLISH LITERATURE: OVERCOMING CULTURAL POVERTY

Jennifer Webb

A practical guide to pedagogy in the English classroom, supporting the teaching abstract, classic and challenging texts and concepts. Many teachers are struggling with the new GCSE syllabus for Literature, and this book provides useful resources, strategies and approaches for the key areas of challenge in the English classroom.



JOHN CATT

E: ENQUIRIES@JOHNCATT.COM
T: +44 (0)1394 389850
W: JOHNCATTBOOKSHOP.COM

INDEPENDENT THINKING FOR EDUCATION

THE PSYCHOLOGY OF BEHAVIOUR MANAGEMENT (PART 1)

Nick Rose

Behaviour management in classrooms has become a hotly contested debate in recent years, both in the UK and abroad. But despite being commonly understood as a priority for effective teaching, many teachers complain that training in this area is often insufficient, or under evidenced. In the first of a series of features, Nick Rose explores some of the science behind the major schools of thought in this area.

The topic of behaviour management and the problems teachers face in dealing with disruption to lessons continues to provoke strong argument within the profession. The extent of the problem was explored in a 2014 paper by Terry Haydn[1] which argued that whilst 'official' reports like Ofsted inspections appeared to rate behaviour as at least 'satisfactory' in the majority of schools, there was evidence that deficits in classroom climate continue to be a serious and widespread problem. Examples of blogs detailing the sorts of issues in school approaches to behaviour are plentiful.[2]

Systems of rewards and punishments have long been the norm in schools, but perhaps because of a growing feeling that behaviour has become increasingly difficult to manage, behaviour management has become the focus of experimentation. Some schools have started looking for novel solutions to the problem of disruption in lessons (for example, Kilgarth School in Birkenhead, UK was recently reported to have 'banned' punishment altogether); others believe that proportionate sanctions need to be available to teachers as a deterrent. In 2015, the UK government set up a working party, led by Tom Bennett, to develop better training for new teachers and showcase effective practices in schools.

One controversial approach has been to move schools away from systems of reward and punishment towards a restorative justice approach. Originally developed within the context of police work, the idea of restorative practice involves conversations between 'offender' and 'victim' (or the student and teacher) to give an opportunity to discuss how they have been affected by events and to decide what should be done to move forward. There are claims that this approach can improve behaviour and results,[3] but critics argue that such policies are making schools less safe.[4] Whilst not always explicitly linked, many of the processes appear to draw upon techniques used in cognitive behavioural therapy (CBT). For example, Restorative Thinking are an organisation that work with schools to implement school restorative practices that make the link to CBT and other forms of therapy explicit.

Another approach has come from Doug Lemov's *Teach Like a Champion*.[5] Lemov's approach involves using standardised routines to create a positive classroom climate. The system has sparked considerable interest in the UK, but also has many critics.

Most teachers likely already use some combination of these various approaches, but teachers may not be aware of the psychological theories and practices which they are (implicitly or explicitly) based upon. Over three articles, I want to briefly explore these psychological underpinnings in the hope they help explain some of the advantages and limitations of each system.

Part 1: Behaviourism

'Behaviourist' is sometimes used in a pejorative way when describing behaviour management systems, but schools using some sort of system for rewarding or sanctioning behaviour are implicitly using a behaviourist approach.

Behaviourism was a term coined by John Watson in an article published in 1913, but its roots go back to the famous studies by Ivan Pavlov (who discovered classical

conditioning as an accidental sideline to his Nobel Prize winning research on digestion). However, the behaviourist most associated with education is B. F. Skinner. Much misunderstood, and often unfairly maligned, his theory of operant conditioning continues to influence schools to this day.

Drawing on the earlier work of Edward Thorndike, Skinner developed his theory of operant conditioning by exposing animals like rats and pigeons to carefully controlled stimuli and recording their responses (a setup often referred to as a 'Skinner box'). Skinner identified a variety of techniques which could be used to shape animal behaviour and wrote about how these might be applied to human behaviour (and education specifically).

The core idea within operant conditioning is reinforcement and punishment. Very simply, when an animal receives reinforcement after performing a behaviour, they are more likely to repeat that behaviour. Conversely, receiving a punishment after performing a behaviour leads the animal to be less likely to repeat that behaviour in future. Skinner further described reinforcements and punishments as being 'positive' or 'negative' in character:

	Reinforcement	Punishment
Positive	A behaviour is followed by a rewarding stimulus – like giving a student merit or some sweets	A behaviour is followed by an aversive stimulus – like telling a student off or giving them a 'teacher stare' to express disapproval
Negative	A behaviour is followed by taking away an aversive stimulus – like allowing a kid to jump to skip the dinner queue	A behaviour is followed by taking away a rewarding stimulus – like confiscating a mobile phone or a detention

Punishments

Skinner's rather harsh reputation means that many teachers are surprised to discover that he was very much against the use of punishment in schools. Skinner believed that one of the major disadvantages of punishment is that, even where it is consistently applied, it merely temporarily suppresses an undesirable behaviour.

> Severe punishment unquestionably has an immediate effect in reducing a tendency to act in a given way. This result is no doubt responsible for its widespread use. We 'instinctively' attack anyone whose behavior displeases us – perhaps not in physical assault, but with criticism, disapproval, blame, or ridicule. Whether or not there is an inherited tendency to do this, the immediate effect of the practice is reinforcing enough to explain its currency. In the long run, however, punishment does not actually eliminate behavior from a repertoire, and its temporary achievement is obtained at tremendous cost in reducing the over-all efficiency and happiness of the group.[6]

Contrary to his rather cold, clinical popular reputation, Skinner was a compassionate humanitarian (he won the American Humanist Association's 'Humanist of the Year' award in 1972) who wanted science to help shape a better society by utilising rewards rather than punishment in order to promote pro-social behaviour. (I suspect he'd have approved of Kilgarth School's decision to 'ban' punishment, for instance.)

However, the issue around the effectiveness of punishment is rather more complex than Skinner believed. For example, a fascinating meta-analysis by Balliet and Van Lange[7] examined whether punishment was more effective at promoting cooperation in high- or low-trust societies. They reviewed 83 studies involving 7361 participants across 18 societies and found a rather surprising conclusion: punishment appears to effectively promote cooperation in societies with *high trust*. In essence, they argue that where there is a great deal of trust, members of a society adhere to norms that encourage both cooperation and the punishment of those who defy cooperative social norms. Punishment is less effective in societies where there is a lack of trust; the authors argue that social norms may be less strongly shared and enforced and so punishment may be less effective in these societies:

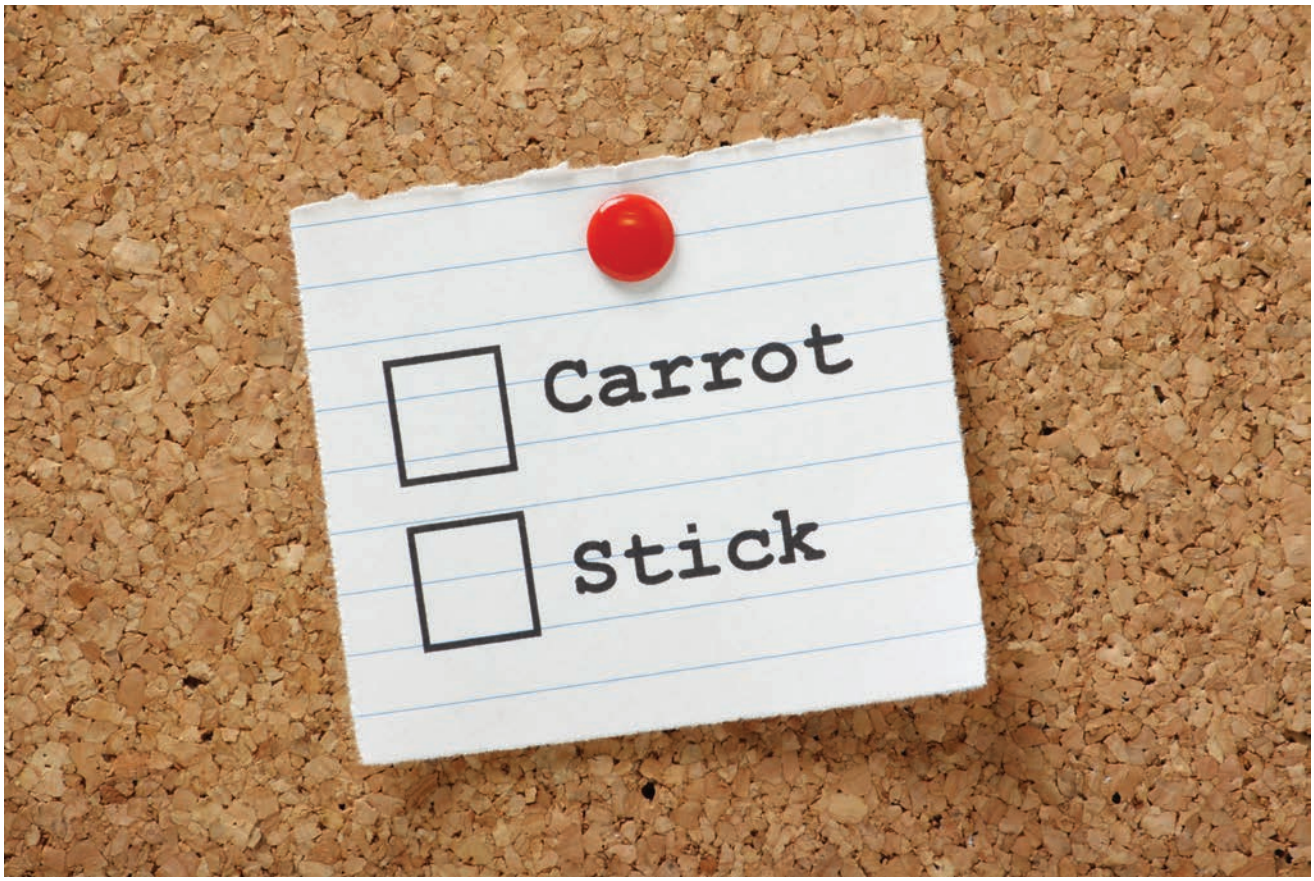
> A willingness to pay a cost to punish others, especially noncooperative others, is likely to be viewed as a strong concern with collective outcomes. At the same time, such benevolent views of costly punishment may be more likely to occur in societies that contain higher amounts of trust in others, which we conceptualized earlier in terms of beliefs about benevolence toward the self and others.

An important question for future research is whether 'benevolent punishment' is as effective at an organisational level (e.g. a school) as it appears to be at a society level. However, the implication would be that in benevolent, high-trust environments, the proportionate use of punishment to support cooperative social norms can be effective.

Another reason why punishment may be effective is a phenomenon called 'loss aversion'. The work of Tversky and Kahneman suggests that there is an asymmetry between the effects of positive reinforcement and negative punishment – in that where people weigh up similar gains and losses, people tend to prefer avoiding losses to making gains. For example, Hackenberg[8] reports an experiment where the value of a loss was worth approximately three times more than a gain. It seems highly likely that this effect might also apply to the sorts of token reward systems employed in schools, suggesting that negative punishment (e.g. loss of merits) may be more motivating than opportunities to gain merits.

Rewards

Skinner believed that rewards were the most effective way of shaping behaviour and focused a great deal of his research attempting to find out the most effective patterns of reinforcement. In his 'Skinner box' experiments, he was able to carefully control the 'schedule of reinforcement' and measure the concomitant changes in the desired behaviour.



Schedule of reinforcement	*Example*
Fixed ratio	A student receives a reward after a fixed number of times they perform a desired behaviour (e.g. a merit every time they attempt an extension question)
Variable ratio	A student receives a reward after a variable number of times they perform a desired behaviour
Fixed interval	A student receives a reward after a fixed period of time in which they perform the desired behaviour (e.g. a merit for working hard for 5 minutes)
Variable interval	A student receives a reward after a variable period of time in which they perform the desired behaviour

Schedule of reinforcement	*Advantages and disadvantages*
Fixed ratio	Behaviour changes quickly Extinction occurs quite rapidly when rewards cease
Variable ratio	Behaviour changes quickly Extinction occurs slowly when rewards cease
Fixed interval	Behaviour changes more slowly Extinction occurs quite rapidly when rewards cease
Variable interval	Behaviour changes more slowly Extinction occurs quite slowly when rewards cease

Intuitively, teachers see the need for consistency where punishments are applied and I've sometimes heard teachers argue that rewards should be given with equal consistency. However, Skinner's work on 'schedules of reinforcement' appears to show that such systems tend to be relatively ineffective. The problem with systems seeking high consistency in rewarding students is that whilst the student's behaviour may be swiftly modified, the desirable behaviour may become highly contingent upon the presence of the reward. The odd thing about rewards is that they appear to work better when they are slightly unpredictable. A simple summary of these differences:

In Skinner's experiments, the extinction rates (the rates at which the desired behaviour stopped being performed) were quickest where there was continuous reinforcement (i.e. a reward given every time the behaviour was performed). Where there was variability in the time interval or ratio, then the behaviour persists for longer in the absence of reinforcement. Skinner believed this represents the 'power' of the slot machine. The fact that playing it is unpredictably rewarded by a pay-out encourages the person to continue playing – even where they hit a long streak of losing.

In schools, sometimes these reward systems take on the structure of 'token economies' (systems also used in prisons and psychiatric units – where individuals earn

tokens for 'good behaviour' which can be used to purchase privileges). However, whilst explicit reward schedules have been used with children (e.g. children with ADD or autism), reward systems have a number of problems which often undermine their use in schools.

One issue is 'satiation' – particularly older children rapidly lose interest in the tokens (e.g. merit stickers) or even primary reinforcers (e.g. sweets) that teachers hand out for desirable behaviour. I recall a student teacher handing out sweets to reward Year 10 students for answering questions in class. Many of the students took part, but I noticed one lad sat there scowling with his arms crossed. Chatting to him, it was clear he knew many of the answers so I asked why he wasn't putting his hand up – he said, 'What's the point? I can just buy my own sweets if I want them.' This problem often leads into what I call 'reward inflation' as teachers either have to constantly find novel rewards or end up handing out more and more tokens to elicit the same desirable behaviour.

Another issue is that reinforcement can have negative effects. It's devilishly hard in a class of 30 students to accurately assess how much effort students have genuinely put into their class or homework. Giving praise or a merit for work which actually required little effort may inadvertently imply that you have low expectations of that student.

Lastly, children aren't stupid. They rapidly learn when they are being manipulated by a reward system and sometimes manage to turn the tables on the teacher by learning to manipulate the criteria used to elicit a reward. I knew one teacher who, in an attempt to tame a particularly difficult class, had managed to trap themselves into handing out four or five merits to a number of the most naughty children every lesson.

Two great articles by Daniel Willingham further explore some of these problems: 'Should learning be its own reward?'[9] and 'How praise can motivate – or stifle'.[10] At the end of this second article, Willingham summarises the way a teacher's most common form of positive reinforcement – praise – might best be utilised:

> Praise should be sincere, meaning that the child has done something praiseworthy. The content of the praise should express congratulations (rather than express a wish of something else the child should do). The target of the praise should be not an attribute of the child, but rather an attribute of the child's behavior.

In summary

Whilst the term 'behaviourist' is used in a pejorative way by some teachers, Skinner desired that his research be used to create societies where reinforcement (rather than punishment) would encourage people to do the right thing. There's an enormous amount that schools could potentially learn from the classic works on operant conditioning and ways to run token economies (which most school reward systems tend to form).

However, there are some interesting reasons why some of Skinner's ideas may need updating. Benevolent punishment and negative punishment (which may tap into our innate loss-aversion bias) may in some cases be equally or more effective than rewards (so long as they are deserved but a little unpredictable). Both can potentially be used to effectively support behaviour in schools.

In the next article in this series, I'm going to take a similar look at the topic of 'restorative practices' and some of the ideas from cognitive-behavioural therapy which underlie many of the systems used in schools.

This article originally appeared on the *Evidence into Practice* blog (available here: www.bit.ly/2WqxJbY) and has been modified for print.

REFERENCES

1. Haydn, T. (2014) 'To what extent is behaviour a problem in English schools? Exploring the scale and prevalence of deficits in classroom climate', *Review of Education* 2 (1) pp. 31–64.

2. Smith, A. (2014) 'Seven signs of a "good enough" discipline system', *Scenes From The Battleground* [Blog]. Available at: www.bit.ly/2QURH8A

3. *Wall Street Journal* (2015) 'Suspension, restorative justice and productive schools', April 8. Available at: www.on.wsj.com/31fte2L

4. Sperry, P. (2015) 'How liberal discipline policies are making schools less safe', *New York Post* [Online], March 14. Available at: www.nyp.st/2Ip2JPP.

5. Lemov, D. (2015) *Teach like a champion 2.0*. San Francisco, CA: Jossey-Bass.

6. Skinner, B. F. (1953) *Science and human behaviour*. New York, NY: Macmillan, p. 190.

7. Balliet, D. and van Lange, P. A. M. (2013) 'Trust, punishment, and cooperation across 18 societies: a meta-analysis', *Perspectives on Psychological Science* 8 (4) pp. 363–379.

8. Hackenberg, T. D. (2009) 'Token reinforcement: a review and analysis', *Journal of the Experimental Analysis of Behaviour* 91 (2) pp. 257–286.

9. Willingham, D. T. (2007) 'Should learning be its own reward?', *American Educator* 31 (4) pp. 29–35. Available at: www.bit.ly/2K8xcoo.

10. Willingham, D. T. (2005) 'How praise can motivate – or stifle', *American Educator* 29 (4) pp. 23–27, 48. Available at: www.bit.ly/2F30P6q

WRITING AND COGNITIVE LOAD THEORY

Natalie Wexler

Cognitive load theory has been described as one of the most important discussions in modern psychology that educators need to be familiar with. Natalie Wexler looks at what the implications of this theory are for the way we teach writing, and what it means in the classroom.

It's been said that reading is the most difficult thing we ask students to do. In fact, that description applies more accurately to writing, which has received far less attention from both cognitive scientists and educators. Because it requires students to express themselves and not merely to receive and process information, writing imposes the greater cognitive load.

It's clear that reading places a heavy burden on short-term or working memory – the aspect of cognition that could also be called 'consciousness', and which can hold only a limited number of things for a limited amount of time. When it comes to decoding, those things include the correspondences between letters and sounds; for reading comprehension, they expand to include knowledge and vocabulary relating to the topic.[1] The key to successful reading is to have as many of these factors as possible stored in long-term memory – which has a virtually infinite capacity – so they don't take up precious space in working memory and overload it.

With writing, background knowledge is even more crucial. It may be difficult to read about a subject that's unfamiliar, but it's virtually impossible to write about one coherently. At the same time, knowledge of the topic is only one of many factors vying for space in working memory. Even when producing a single sentence, inexperienced writers may be juggling things like letter formation, spelling, word choice, and sentence structure. When asked to write at length, they need to cope with the challenges of adhering to a topic, creating smooth transitions, avoiding repetition, and ensuring that the overall organization of the piece is coherent. All of this is in addition to absorbing the information that forms the basis for their writing, deciding what to say about it, and anticipating what a reader will need to know.

In some situations, the key to easing cognitive load is to provide what are known as 'worked examples'. Rather than asking learners who are unfamiliar with a topic to acquire knowledge through solving problems themselves, the theory goes, teachers should have them study problems that have already been solved. In the context of math, for example, research has shown that students who study worked examples of algebra problems perform better than those who solve problems on their own, when tested later on their ability to solve similar problems. The reason appears to be that problem solving imposes such a heavy cognitive load on novice learners that they have little capacity left for transferring the strategies they've used into long-term memory.[2]

It's been suggested that the worked-example effect can be applied to writing as well: if teachers explicitly teach sentence structures and vocabulary, provide exemplars that illustrate these things, and lead discussions on the subject, students should be able to study the exemplars and reproduce those features in their own writing.[3] But many American teachers already use a version of worked examples when trying to teach writing: they show students 'mentor texts' to use as models.[4] Considering that a mere 25% test of American students test at the proficient level in writing,[5] it's fairly clear that that approach is not having the desired effect.

Showing students exemplar *sentences* rather than entire texts is definitely a step in the right direction, because it focuses students' attention on a manageable unit. But

the problem, as Greg Ashman has put it, is that there's a difference between 'knowing *that*' and 'knowing *how*'. Students may know, for example, *that* a sentence is 'a set of words containing a subject and a predicate and expressing a complete thought'. Showing students examples of complete sentences and contrasting them with sentence fragments may make the concept more concrete. But many students will nevertheless fail to know *how* to write complete sentences and continue to use sentence fragments in their own writing. A basic problem is that the massive cognitive load that inexperienced writers face makes it difficult for them to remember to put their conceptual knowledge into practice.[6]

How do we get students to know how to write well? That question is crucial, and not just because we want students to acquire writing skills. When the cognitive load is modulated, writing is perhaps the most effective way to build and deepen students' knowledge and develop their analytical abilities. To be sure, students need some knowledge of a topic to *begin* writing. But once they start to write, they need to recall information they have recently learned, determine which points are important and connect them to one another, and put all of this into their own words. If students have the cognitive capacity to engage in these steps, the effect is powerful – akin to the 'testing effect' (the boost in retention that comes from being quizzed on recently learned material) and the similar 'protégé effect' (which results from explaining a topic to another person).[7,8]

Because of the complexity of the writing process, students need more than direct instruction and worked examples to become competent writers. They need 'deliberate practice': repeated efforts to perform aspects of a complex task in a logical sequence, with a more experienced practitioner providing prompt and targeted feedback.[9] And for many students, including many at upper grade levels, this kind of practice needs to begin at the sentence level – partly because sentences are the building blocks of all good writing, and partly because sentence-level tasks lighten the cognitive load. That's not to say that constructing a sentence is an inherently simple task. It all depends on the content. For example, there's nothing simple about completing this sentence: 'Immanuel Kant believed that space and time are subjective forms of human sensibility, but _____.'

When the cognitive load is modulated, writing is perhaps the most effective way to build and deepen students' knowledge and develop their analytical abilities.

Deliberate practice in writing also needs to extend beyond English class to the rest of the curriculum. Not only does that provide teachers of history, science, math, and other subjects with a powerful tool to enhance their instruction, it also gives students more opportunities to practice the writing strategies. Eventually, many of those strategies will become lodged in long-term memory, becoming so automatic that students don't even realize they're using them.

When students are ready to embark on lengthier writing, where the cognitive load is even greater, they need to learn to construct clear, linear outlines that enable them to organize their thoughts, avoid repetition, and stay on track. Juggling those tasks in working memory while writing can be overwhelming even for many experienced writers. Once students have used an outline to create a draft, they can use their pre-existing knowledge of sentence-level strategies to vary their sentence structure and create smooth transitions.

While this approach to writing is still rare and unorthodox, it is gaining traction largely thanks to a US-based organization called *The Writing Revolution*, of which I am board chair, and a book that explains the method – also called The Writing Revolution – of which I am the co-author with Dr Judith C. Hochman. A veteran educator, Dr Hochman has developed a series of writing strategies that are designed to be taught explicitly and practiced repeatedly in a variety of contexts, with prompt feedback from a teacher. Although originally created for learning-disabled students, the method has been shown to be effective with students of all abilities, including those still learning English.

What does the method look like in practice? Let's return to the example of students who use sentence fragments rather than complete sentences. In addition to showing

students examples of fragments and complete sentences side by side, the Hochman Method has students practice distinguishing between the two – *and* turning the fragments into complete sentences. For older or more sophisticated students, the terms 'subject', 'verb', and 'predicate' might be used, but it's sufficient to simply ask questions in functional terms. For example, if a fragment says, 'ate a great meal,' the teacher might ask the class, 'Does that tell us *who* ate a great meal? How can we make these words into a sentence?'[10]

To derive the maximum benefit from this activity, the examples should be embedded in whatever content students are learning. A math teacher who has taught rational numbers could review – and simultaneously build writing skills – by giving students the following fragments and asking them to transform the phrases into sentences, with proper punctuation and capitalization:

can be expressed as a fraction or a ratio

rational numbers

Their responses might be:

A rational number is a number that can be expressed as a fraction or a ratio.

Rational numbers can be ordered on a number line.

Eventually, through the repeated process of identifying and correcting fragments, students will develop an understanding of how to create a complete sentence and apply that knowledge to their own writing.

Students don't need to learn the names of grammatical structures and parts of speech for their own sake. But certain terms are useful as a shorthand for strategies that will enhance writing and lessen cognitive load. For example, the method has students learn the word 'appositive' – that is, a phrase that renames a noun – because it provides them with an effective strategy for varying sentence structure and expanding their responses. Once students have grasped the concept, they can be asked to provide appositives for sentences grounded in the content of the curriculum. A biology teacher might give students the sentence, 'Natural selection, _____, results in species with favorable traits.' A student might supply the appositive, 'a process of evolution'.

When students have moved on to lengthier writing, they're advised that appositives can be used to create good topic sentences – and they'll understand what to do. Ultimately, that information will be stored in their long-term memory, along with the knowledge of other possible sentence types and structures, to be drawn on when beginning a paragraph or an essay. Rather than having their working memory occupied with searching for a way to begin – or, if they're revising an essay, to vary their sentences – they'll be able to devote more cognitive capacity to what they want to say.

Those of us who are already competent writers have vastly underestimated the difficulties faced by many (if not most) students in reaching that point. In years past, the assumption was that teaching rules of grammar and parts of speech was sufficient. After studies determined that approach had no positive impact on student writing, and in some cases had a negative one,[11] another school of thought took hold. Its proponents assumed students would basically pick up the conventions of written language if they just read enough mentor texts and engaged in enough writing.[12] Given the generally dismal results, it's time for a new approach, supported by research: explicit instruction, mentor texts or 'worked examples', and the deliberate practice that will enable students to transform their conceptual knowledge into knowing how to write. Not only will schools produce better writers, but easing the cognitive load imposed by writing will lead to better thinking as well.

REFERENCES

1. Willingham, D. (2017) *The reading mind: a cognitive approach to understanding how the mind reads*. San Francisco, CA: Jossey-Bass, pp. 116–18.

2. Ashman, G. (2018) *The truth about teaching: an evidence-informed guide for new teachers*. London: SAGE Publications, pp. 42–43.

3. Needham, T. (2019) 'Cognitive load theory in the classroom', *researchED 3*, pp. 31–33.

4. Alber, R. (2014) 'Using mentor texts to motivate and support student writers', *Edutopia* [Website]. Available at: www.edut.to/2IB3ZPI.

5. The Nation's Report Card (2011) *Writing 2011*. US Department of Education, Institute of Education Sciences. Washington, DC: United States Government Publishing Office. Available at: www.bit.ly/2I9LGm1.

6. Ashman, G. p. 122.

7. Roediger, H. and Karpicke, J. (2006) 'Test-enhanced learning: taking memory tests improves long-term retention', *Psychological Science* 17 (3) pp. 249–255

8. Boser, U. (2017) *Learn better: mastering the skills for success in life, business and school*. New York, NY: Random House.

9. Ericsson, K. A. and Pool, R. (2016) *Peak: secrets from the new science of expertise*. New York, NY: Houghton Mifflin.

10. This example and others are taken from Hochman, J. C. and Wexler, N. (2017) *The writing revolution: a guide to advancing thinking through writing in all subjects and grades*. San Francisco, CA: Jossey-Bass.

11. Graham, S. and Perin, D. (2007) *Writing next: effective strategies to improve writing of adolescents in middle and high schools*. Washington, DC: Alliance for Excellent Education.

12. Calkins, L. M. (1986) *The art of teaching writing*. Portsmouth, NH: Heinemann.

researchED

PLEASE DONATE TO KEEP OUR MAG INDEPENDENT!

ResearchED Magazine has quickly become a key part of the global movement to give teachers and school leaders voice and agency in their work, their schools and their systems: a high-quality platform to bring together the voices of teachers, academics and education experts in order to reclaim the space of education discourse.

As you are someone who reads and enjoys the magazine, please do consider a small voluntary donation.

Financial support from our readers means we can continue to publish and distribute a high-quality resource, and continue to attract editorial contributions from the likes of Professor Daniel Willingham, Daisy Christodoulou and Professor Paul Kirschner.

While the publication does carry a small amount of advertising, the **researchED** magazine is editorially independent – our publication is free from commercial 'advertorials'. This is important because it enables us to focus on genuinely relevant and useful articles, collated with the aim of raising research literacy and exploring what actually works in education.

Donations from our readers will enable us to continue to source articles and interviews from the brightest minds in education. If you felt able to contribute, we would be delighted.

Thank you!

DONATE VIA:

www.johncattbookshop.com/books/magazines/researched-journal

EVIDENCE-BASED SCHOOL LEADERSHIP

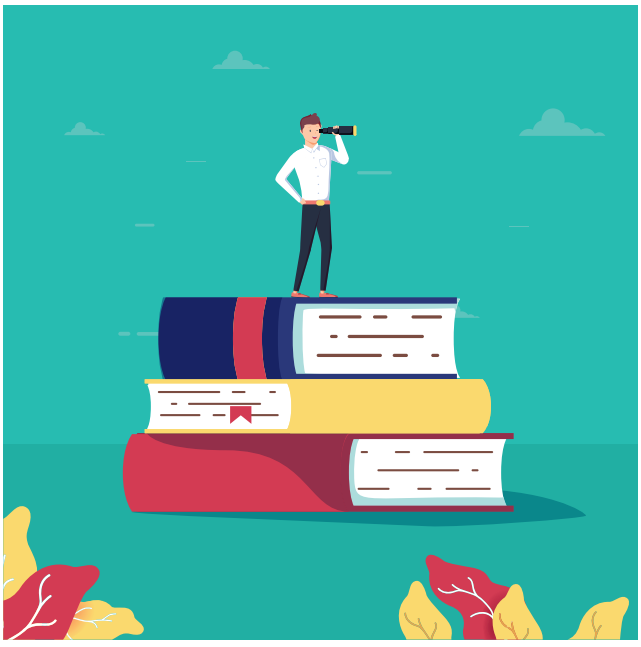
Dr Gary Jones

A veteran of speaking about evidence, Gary Jones flags up some concerns he has about the difficulty of leading a school in an evidence-informed way that is also meaningfully and, crucially, has an impact that matters.

The first **researchED** event I attended was the London national conference in September 2014. Without doubt, this was some of the most inspiring and influential professional development I had experienced in the 30 years I had been involved in education. It was inspiring because I was taking part in an event with over 1000 teachers who had given up a Saturday morning to speak and listen about something they cared about – namely, improving teaching and learning though the appropriate use of research evidence. It was influential in that it got me thinking, reading and writing about evidence-based school leadership and management.

researchED London 2014 got me thinking about evidence-based school leadership and management for two reasons. First, the vast majority of the sessions at the event had a focus on teaching and learning and little attention seemed to be paid to the role of research and other sources of evidence in the decision-making of senior leaders in schools. Second, that summer I had by chance read an article by Adrian Furnham[1] which introduced me to the discipline of evidence-based management and I was intrigued as to whether there was a possible synthesis with evidence-based education. This contributed to me writing a book – *Evidence-based School Leadership and Management: a practical guide* – and 220 blogposts (www.garyrjones.com/blog).

So having written around 300,000 words on all things evidence-based, I would like to make the following observations about the current state of evidence-based practice within schools. First, the 'evidence-based movement' is not going away any time soon. We have 22 schools in the Research Schools Network; an increasing number of schools appointing schools research leads; hundreds if not thousands of educational bloggers contributing to discussions about how to improve education; social media and EduTwitter providing a forum for the articulation of views; over 20 **researchED** conferences scheduled for 2019; the Education Endowment Foundation (EEF) spending over £4m in 2017–18 to fund the delivery of 17 projects, involving 3620 schools and other educational settings reaching



We need to have an honest conversation about teachers' research literacy and their subsequent abilities to make research-informed changes in their practice.

approximately 310,000 children and young people[2]; and finally, we have Ofsted using research evidence to inform their inspection framework.[3]

Nevertheless, despite all this time, effort and commitment being put into research and evidence-based practice, there is still much to ensure evidence-based practice contributes to improved outcomes for pupils. First, we need to have an honest conversation about teachers' research literacy and their subsequent abilities to make research-informed changes in their practice. Research undertaken by the National Foundation for Educational and the EEF suggests that teachers have a weak variable knowledge of the evidence-based relating to teaching and learning and have a particularly weak understanding of research requiring scientific or specialist knowledge.[4] Second, there is a distinction between the rhetoric and the reality of evidence-based practice within schools. Research undertaken for the Department for Education identified a number of schools where headteachers and senior leaders 'talked a good game' about evidence-informed teaching within their schools, whereas the reality was that research and evidence was not embedded within the day-to-day practice of the school.[5] Third, it's important to be aware there is a major debate taking place amongst educational researchers about randomised controlled trials, effect sizes, meta-analyses. Indeed, as Professor Rob Coe states: 'Ultimately, the best evidence we currently have may well be wrong; it is certainly likely to change.'[6]

And finally, if I were to offer any advice to teachers, school leaders and governors/trustees who are interested in evidence-based practice, it would be the following. Becoming an evidence-based practitioner is hard work. It doesn't happen by just reading the latest EEF guidance document, John Hattie's *Visible Learning* or by spending one Saturday morning a year at a **researchED** conference. It requires a career-long moral commitment to challenging both your own and others' practice, critically examining 'what works' to ensure whatever actions you take bring about improvements in pupil outcomes.

Dr Gary Jones is the author of Evidence-Based School Leadership and Management: a practical guide. Prior to his recent work – in blogging, speaking and writing about evidence-based practice – Gary worked in the further education sector and has over 30 years of experience in education as a teacher and senior leader. Gary is currently engaged by the University of Portsmouth as a researcher on projects looking at area-based reform and increasing social mobility.

@DrGaryJones

www.garyrjones.com/blog

Further reading:

Brown, C. (2015) *Leading the use of research & evidence in schools*. London: UCL IOE Press.

Barends, E. and Rosseau, D. (2018) *Evidence-based management: how to use evidence to make better organizational decisions*. London: Kogan-Page.

Cain, T. (2019) *Becoming a research-informed school*. London: Routledge.

Jones, G. (2018) *Evidence-based school leadership and management: a practical guide*. London: SAGE Publishing.

Kvernbekk, T. (2016) *Evidence-based practice in education: functions of evidence and causal presuppositions*. London. Routledge.

REFERENCES

1. Furnham, A. (2014) On your head: a magic bullet for motivating staff?, *The Sunday Times*, 13 July.

2. Education Endowment Foundation (2018) *EEF annual report 2018*. London: EEF. Available at: www.bit.ly/2Iw9ajY

3. Ofsted (2019) *Education inspection framework: overview of research*. London: The Stationery Office. Available at: www.bit.ly/31hVQbN

4. Nelson, J., Mehta, P., Sharples, J. and Davey, C. (2017) *Measuring teachers' research engagement: findings from a pilot study: report and executive summary*. London: Education Endowment Foundation/ NFER.

5. Coldwell, M., Greany, T., Higgins, S., Brown, C., Maxwell, B., Stiell, B., Stoll, L., Willis, B. and Burns, H. (2017) *Evidence-informed teaching: an evaluation of progress in England*. Department for Education. London: The Stationery Office.

6. Coe, R. (2018) 'What should we do about meta-analysis and effect size?', *CEMblog* [Blog]. Available at: www.bit.ly/2ZcWm96

AMBITIOUS RHETORIC, BUT THE REALITY FALLS SHORT

Professor Walter Humes

Education in Scotland is often trumpeted by some as exemplary, with other countries – such as Wales – using it as a template from which to build their own systems. But recent years have seen troubling levels of unhappiness in the education community about the reality of delivering the Curriculum for Excellence (CfE) – the once-lauded program of educational reinvention that was supposed to revolutionise the learning of a nation's children. Here, Walter Humes looks at some of the problems with the CfE, and what went wrong.

This article is based not only on my own analysis of the situation in Scotland, but also on the views of a small sample of people who are well placed to comment on the extent to which educational policy and practice are informed by research evidence. They include academics and researchers who have worked with government agencies, funding bodies and local authorities, a senior figure in a national organisation that regularly responds to consultations and policy proposals, and an experienced headteacher. To encourage frankness, respondents were guaranteed anonymity. Responsibility for the text that follows is, however, entirely mine.

Behind the official discourse

The word 'evidence' appears no fewer than 41 times in the document *A Research Strategy for Scottish Education*.[1] The paper's aims include a commitment to 'learning from data and evidence', 'empowering practitioners to produce and use evidence and data', and the 'effective commissioning and dissemination of evidence on 'what works'. The reference to 'what works' suggests a rather narrow view of the function of educational research – it should be concerned with fundamental questions of meaning and value, not just practical recommendations – but the general thrust seems to indicate a positive attitude towards the use of evidence at classroom, school, local authority and national levels.

However, these aspirations need to be understood against a background of mounting criticism about the Scottish Government's record in relation to research and the use of evidence in policy development. The OECD report of 2015 which reviewed the progress of Scotland's flagship policy of Curriculum for Excellence, launched in 2004, said that it could not conduct a full evaluation of the reform programme because there was insufficient information available.[2] It called for 'a robust evidence-base on learning outcomes and progression'. A similar plea was made in a report by the International Council of Education Advisers (ICEA), appointed by the Scottish Government in 2016, partly in response to public disquiet about a perceived decline in standards. One of the recommendations in the ICEA report was that the government should work with universities and other providers 'to further develop and implement the educational research strategy published in 2017. This will enhance the system's capacity for independent research and evaluation, and build a Scottish empirical evidence base'.[3]

It is significant that it has taken pressure from outside Scotland to produce a shift of attitude in relation to research. Until recently, the post-devolution period was marked by progressive disengagement of government officials from the research community.[4] Many academics felt that researchers were regarded with suspicion by politicians, inspectors and local authority officers, especially if their work took a critical line. The notion that critique may lead to improved strategies was not welcome in the conformist culture of Scottish education.

Although the mutual mistrust has eased slightly, with some reports that government is more willing to listen, it should not be overstated. One researcher recounted conflicting experiences in relation to the influence of his work on policy. He said that a particular project 'did influence aspects of government policy' and offered two explanations: first, the agency funding the research played an important role 'in brokering access to policy makers'; and secondly, the research was 'timely' in the sense that the topic being investigated was already 'gaining some momentum in government'.

Another project fared less well. It had minimal impact partly because 'multiple policies were being introduced and the civil servants had little time to engage fully with the issues'. Furthermore, there seemed to be limited capacity to synthesise the results of this project with other related studies which had been commissioned, and so the opportunity to better inform proposed policies was missed.

These examples illustrate that policy making is rarely an entirely rational process. It is often messy, time-constrained, and subject to chance and the interventions of powerful players. Furthermore, research that is consistent with the current direction of travel within official policy circles is more likely to make an impact than research which raises challenging questions. This casts doubt on the degree of objectivity with which research evidence is reviewed by officials.

Longitudinal surveys

Any education system requires reliable information on which to base decisions. Over the last ten years, Scotland has withdrawn from certain surveys that provided useful comparative data which enabled trends to be identified. These included two international studies: PIRLS (Progress in International Reading Literacy Study) and TIMSS (Trends in International Mathematics and Science Survey). The ostensible reason was cost, but the decision was widely criticised as indicating a desire to conceal disappointing results. The Scottish Survey of Literacy and Numeracy (SSLN) was scrapped after the 2016 results indicated some downward trends, a pattern that was also shown in the findings of the 2015 PISA (Programme for International Student Assessment) report. Scotland does, however, continue to take part in the PISA programme. The introduction in 2017–18 of Scottish National Standardised Assessments (SNSAs) was controversial and the robustness of the data they will generate has been questioned.

Research that is consistent with the current direction of travel within official policy circles is more likely to make an impact. This casts doubt on the degree of objectivity with which research evidence is reviewed by officials.

Scotland's current position is at odds with its historical record in this regard. A persistent critic of the Scottish Government's attitude to independent research has been Lindsay Paterson, Professor of Education Policy at Edinburgh University. He has pointed out that in the middle decades of the 20th century, Scotland was a pioneer in the use of statistical surveys of school pupils, through the work of the Scottish Council for Research in Education. Later, the Centre for Educational Sociology at Edinburgh University carried out school leaver studies, starting in 1962 and running to 2005. These enabled researchers to evaluate the effects of major educational reforms, such as the introduction of comprehensive education and the expansion of higher education. Paterson argues that the current dearth of good-quality survey evidence makes Scotland a 'data desert'. His conclusion is bleak: 'There is now no survey series with which to hold Scottish government to account, and not even an openness in government to methodological discussion of the kinds of evidence that would be needed. This closing of minds to science is the very antithesis of accountability.'[5] Echoing the concerns of Paterson, Howieson and Croxford have reinforced the need for 'system-wide, longitudinal data to enable a country to "know" its education and training system'.[6] One longitudinal study that does exist is Growing Up in Scotland, started in 2005, tracing the development of 'nationally representative cohorts' of children over time (www.growingupinscotland.org.uk). It has produced interesting findings but it could not be used to evaluate Curriculum for Excellence, because there was no equivalent earlier study to enable meaningful comparisons to be made.

Local authorities and other organisations

Central government is not the only agency with an interest in research evidence. Local authorities routinely collect data on the attainment of schools in their area, including standardised assessments of literacy and numeracy. This information can be used in discussions with headteachers about areas of strength and weakness. A key priority in recent years has been the desire to raise attainment generally, but in particular to reduce the gap in attainment between pupils in socially advantaged areas and those in deprived communities. Some headteachers claim that the instrument used to measure this, the Scottish Index of Multiple Deprivation (SIMD), based on postcodes, is too crude: there are disadvantaged children living in 'affluent' areas and not all children in 'poor' areas are deprived. This can be a particular problem in rural communities where the social and economic profile may be resistant to classifications that work in inner cities. Similarly, Insight, an

online benchmarking tool for secondary schools and local authorities designed to help improve outcomes, makes it difficult to detect reliable trends when pupil numbers are small. There is also a concern about the capacity of senior staff to interrogate data and to use it effectively to make improvements. Teachers at all levels would benefit from opportunities to interpret research findings, whether quantitative or qualitative – a provision that would require both time and support.

This last point connects with an observation made by a senior academic familiar with staff development approaches in a number of Scottish local authorities. She reported that John Hattie's work (as set out in *Visible Learning* and *Visible Learning for Teachers*) was strongly promoted, presumably because it drew on a wide range of research evidence and offered clear guidance about high-impact teaching strategies. But the academic wondered how well some of those recommending Hattie's ideas understood the nuances of his approach. A simplistic application of research evidence may have unintended negative consequences.

Education Scotland, the national advisory body on the curriculum, claims that it draws on research in framing policy advice, though its record in this regard is patchy. The Scottish Qualifications Authority, which runs the national examination system, does rather better, collecting and analysing data on exam entries and results for the qualifications it offers. In recent years, the General Teaching Council for Scotland has sought to encourage teachers to engage in various forms of professional enquiry designed not only to enhance personal development but also to benefit the school through sharing insights with senior management and colleagues. The extent to which this represents a new approach and a genuine opening-up of professional autonomy has been questioned.[7]

Grassroots developments and their limitations

There are a few indications of more positive developments. After years of disengagement from the research community, there are now regular contacts between the Cabinet Secretary for Education (John Swinney) and University Deans of Education. For these to be effective, leaders in the academic community will need to be prepared to abandon their tendency to collude in the deferential culture of Scotland's educational establishment. Critics (such as the present writer) claim that academics have sometimes been complicit in their own containment. Perhaps a more encouraging development is taking place at grassroots level, where independent websites, personal blogs and social networking platforms enable teachers to share ideas, recommend reading and report on pedagogic innovations. In addition, increased numbers of practitioners are undertaking part-time study for postgraduate degrees. And judging from the success of last year's well-attended **researchED** conference in Scotland, independent of the national agencies, there is a growing movement by teachers seeking to shape their own professional development and to pass on their insights to others. This event included interesting presentations on metacognition, memory research, the art and science of learning to read, the relation between family income and children's developmental outcomes,

and how teachers can best engage with research. The old 'top-down' model, led by government officials and controlled by bureaucratic institutions, has not served Scotland particularly well. A development that suggests classroom teachers are exercising greater agency in identifying topics worth investigating is surely to be welcomed.

But will that be enough? Here we need to be realistic about the political context. All governments tend to take a short-term view of policy initiatives. They think in terms of the next election and want to be able to boast of having fulfilled at least some of their promises. Many educational problems are complex and long-term, resistant to simple answers and 'quick fixes'. Research evidence may be welcome up to a point, but in the cut and thrust of elections more powerful imperatives may come into play. Presentation becomes more important than substance and the language of public relations takes over from the measured tones of research. As Ben Levin (a Canadian who has worked both as an academic and a government adviser) has written: 'In the political world belief is everything … No amount of evidence will displace or replace politics.'[8]

REFERENCES

1. Scottish Government (2017) *A Research Strategy for Scottish Education*. Edinburgh: Scottish Government.

2. Organisation for Economic Cooperation and Development (2015) *Improving schools in Scotland: an OECD perspective*. Paris: OECD.

3. International Council of Education Advisers (2018) *Report 2016–18*. Edinburgh: Scottish Government.

4. Humes, W. (2013) 'Political control of educational research', *Scottish Educational Review* 45 (2) pp. 18–28.

5. Paterson, L. (2018) *Scottish education policy: why surveys matter.* CES Briefing No. 66. Edinburgh: Centre for Educational Sociology.

6. Howieson, C. and Croxford, L. (2017) 'To know ourselves? Research, data and policy-making in the Scottish education system', *Journal of Education and Work* 30 (7) pp. 700–711.

7. Humes, W. (2014) 'Professional update and practitioner enquiry: old wine in new bottles?', *Scottish Educational Review* 46 (2) pp. 54–72.

8. Levin, B. (2010) 'Governments and education reform: some lessons from the last 50 years', *Journal of Education Policy* 25 (6) pp. 739–747.