TEACHING
REBOOTED

OTHER TITLES BY JON TAIT

100 Ideas for Secondary Teachers: Engaging Learners

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Using the science of learning to transform classroom practice

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INTRODUCTION

So much teacher training and professional development over the last 20 years has been devoted to areas such as relationship building, behaviour management and the ability to engage students. It goes without saying that these are all vitally important skills, and without them you are certainly not going to be an effective teacher. However, there are some areas of professional knowledge and learning that appear to have been missing from almost everyone's professional toolkit. Among the most alarming are the very fundamentals about how we learn and retain information as human beings. When you strip back what our core business is as teachers, and how our students (whether we like it or not) are assessed at the end of our input to judge how well they have progressed under our care, it staggers me that, as a profession, we have not paid closer attention to the research on how students learn most efficiently and effectively. Far too much time has been spent thinking that, if we ensure our students are engaged (or, in some of the worst cases, 'entertained'), then they will somehow just 'get it' when the time comes to put pen to paper in the exam hall.

Engaging students is only half the battle. Getting students engaged in what you are delivering is paramount, but that still doesn't mean that they are going to remember everything you are talking about when they come to be assessed on it. The blood, sweat and tears that we lose at the front of our classroom every day may be completely wasted if we don't have a good grasp of cognitive science and the implications this may have on our classroom craft. From planning to assessing and everything in between, cognitive science should form the bedrock on which we stand as teachers. Unnecessary time, money and resources should not be wasted on strategies that have already been proven not to be particularly successful. Blindly trialling new approaches on students and using them as your crash-test dummies when there is already a wealth of research on what might be your best bets in the classroom is almost negligent as a professional.

Rest assured though, evidence-based teaching isn't about removing human judgement, experience and essential knowledge of context from the decision-making of teachers and replacing it with a raft of research reports and directives that teachers must follow in robotic form. Evidence and educational research should add to the experience and skill of a teacher to help their strategic decision-making, ensuring it becomes more reliable, efficient and effective. Robert Coe, Director of Research and Evaluation at Evidence Based Education, sums this up very well: 'Research can never tell teachers what to do, nor should it; it can, however, help provide teachers and leaders with what Prof. Steve Higgins (and others) have called "best bets". It can – and should – provide the theory underpinning the action in classrooms, leadership meetings, governing body committees and policy-making discussions.' (Coe and Kime, 2019)

A MORE MEDICAL APPROACH TO TEACHING

One way of looking at the role of evidence in education is by comparing teaching with the medical profession. You wouldn't expect to go to the hospital and have a surgeon try out a new medical procedure on you, just because he or she thought it sounded like a good idea. However, there was a time when this was the norm. In his article 'Building Evidence into Education', Ben Goldacre (2013), a doctor and academic, explains that before evidence-based medicine made a more common and consistent appearance in hospitals and doctors' surgeries up and down the country, medical practice was driven by the personal experience of the doctor in

front of you. Goldacre says: 'Many doctors – especially the most senior ones – fought hard against [evidence-based medicine], regarding [it] as a challenge to their authority. In retrospect, we've seen that these doctors were wrong. The opportunity to make informed decisions about what works best, using good-quality evidence, represents a truer form of professional independence than any senior figure barking out their opinions.'

Unfortunately, an identical situation has been happening in classrooms up and down the country for decades, with us teachers trying to find effective ways to get students to learn by a process of trial and error, with very little evidence to back up our choices and strategic decisions. In our defence, unlike the common cold or a broken leg, which can probably be treated as similarly in Middlesex as it can in Middlesbrough, context is key in education. No one child is the same and, as the experienced ones amongst us will tell you, even a strategy that works for a group of students before lunch might not be a successful strategy straight after lunch. Dylan Wiliam summed this up perfectly in 2015 when he said, 'in education, everything works somewhere and nothing works everywhere'. Having said that though, a set of guiding principles, firmly rooted in robust and globally accepted research, would be a great place to start when thinking about how we might teach our children. Irrespective of the specific context that a teacher may find themselves in, whether influenced by socio-economic or geographical factors or even gender bias, robust research from globally accepted studies can provide tried-and-tested theories that are based on biology and psychology – and not just on hearsay and rumour.

Thankfully, with a trend of research-informed practice sweeping into schools, a new dawn has broken across the educational landscape, shining light on how we truly learn as human beings. Research on cognitive science by leading academics from some of the finest universities across the world is now being brought into the mainstream education arena and teachers are beginning to use it as a basis for their classroom practice. Organisations such as the Education Endowment Foundation, Evidence Based Education, ResearchEd, The Chartered College of Teaching and the Research Schools Network, to name just a few, are making huge strides in this area. The emergence of this research into the mainstream classroom does carry its own problems (as we'll see on page xiii), but the very fact that teachers and school leaders are beginning to consult key pieces of international research on cognition, before they plan, write and deliver their curriculum, means that there is a definite shift happening. If we pride ourselves on delivering a world-class education system for our children, then surely we also need

to pride ourselves on the fact that our strategies for getting the best out of those children are based on firm foundations, rather than a guessing game in the hope that something might work for the majority.

Having started my teaching career through the Graduate Teacher Programme (GTP), I wondered if I'd somehow missed out on this bedrock of educational research and knowledge. I felt I may have been one of the very few imposters in education, happily going about my business every day, without the knowledge of these studies underpinning my classroom practice. Luckily for me, but probably sadly for the profession and the children who have passed through our classrooms before us (and we can count ourselves in that), everyone I meet and talk to about this is coming to the same conclusion – it's time to stop the guessing games and begin acting on what we know works.

ENGAGING WITH RESEARCH

In hindsight, teachers (including myself) have probably been given far too much freedom to think up their own strategies of how to get students to learn information and then perform well on their assessments and exams. This trial-and-error system has not only caused vital time to be wasted in the classroom, but it has undoubtedly put significant amounts of pressure on individual teachers to come up with 'the answer' to their professional conundrums. I am absolutely adamant that, if the research we are learning about now had been common knowledge between teachers 30 years ago when I started secondary school, many of the weird and wonderful strategies that we've seen or experienced during this time wouldn't have made it past the initial planning stage on the back of a beer mat. That's not to say I think we should have factory-like schools, where teachers are robbed of their creativity and children are all taught in the same way just because a study has recommended it. Far from it. Our children need creative teachers to light up their imagination and passion for their subject. Their creativity and energy just need to be channelled in different ways. Too much time is being spent trying to reinvent how the brain retains information, or planning tasks and resources that have no impact on learning. Engagement with research should not only improve the reliability of the strategic decisions you make in the classroom, but should also help to reduce your workload. You will inevitably spend less time thinking up strategies that may have little impact, and you will need to plan fewer intervention activities because your strategies will be more effective the first time round.

SHARING RESEARCH WITH STUDENTS AND PARENTS

Research should not just be kept in the clutches of the teachers, like a secret code that stays within the magic circle. Passing on key messages to our students on the most efficient and effective ways to study should be one of our main priorities as teachers. If we can stop children making the same time-honoured mistakes as we made when we had to revise for our exams, by just re-reading our notes, and instead use some internationally recognised strategies on how to build effective study habits, then we might have just found a game changer. It is also key for our students to understand 'the why' behind our curriculum principles and why we have sequenced the curriculum like we have. Whether it is so they understand why you are spacing out their learning, or why you are quizzing them on a unit they studied a couple of months ago, it makes the 'desirable difficulties' that you are introducing into your classroom practice make sense to everyone.

There are also benefits of drip-feeding some of these key principles of how we learn to the parents and carers of our students. You can be sure that, if the teaching professionals haven't been aware of the research behind cognitive science and how we learn, the majority of parents won't have either. In my experience, the vast majority of parents really want to support their child at home, but sometimes feel unable to do so, due to a lack of significant subject knowledge needed under the new examination specifications. However, by educating parents on how their child can better understand and retain information (irrespective of the subject content), and the simple but effective role they can play in that, you can begin to maximise the impact of your actions as a school. Many of the guiding principles, once broken down into bite-sized chunks or headline messages, can easily be picked up by parents and implemented at home to support children to reach their true potential.

THE PROBLEMS WITH RESEARCH

It is quite startling that some of the theories, strategies and practices that teachers have come to count on through folklore and staffroom whispers are at odds with what some of the research is now telling us (think learning styles or Brain Gym®). Even more surprising is that some of this research isn't hot off the press either. It is research that has been around since before many of us began our teaching careers and in some cases before we were even born. Take, for instance, Ebbinghaus's Forgetting Curve way back in

1885 (see page 15), Bjork's work on retrieval practice in 1975 (see page 3) or Sweller's cognitive load theory from 1988 (see page 92) All of these theories are fundamental to how we learn and we'll take a deeper look at them in the chapters of this book. If you're reading this book as a seasoned teacher or even as someone who has just passed their NQT year, you may be frustrated at how much time you could have saved yourself if you'd known about these theories in your training year – and, more importantly, how many children could have been exposed to better teaching techniques, meaning that they acquired more long-term knowledge and improved their life chances as a result.

So why has it taken this long for the profession to grab hold of evidence-based research, take it out of the clutches of the academics and put it in the hands of the teachers in our classrooms? And why, if some of the research has made it through the iron fences of our schools, has it not had the impact that we'd hope? To answer these questions, we need to acknowledge that there are several problems with research in education. These are not reasons to turn a blind eye to research, or to dismiss it. They are simply a set of warning lights for you to be aware of when reading, interpreting and implementing research in your classroom.

ACCESSIBILITY

Until recently, many research studies were hidden away from the busy classroom teacher in research papers. Although they weren't under lock and key, you had to know what you were looking for and how to get your hands on it. Many teachers simply did not know that these studies existed and didn't have the time to spend hours trawling university libraries for potential studies relating to learning. In recent years this situation has improved enormously thanks to digital technology and the accessibility of almost anything you want to find on the internet. This has been further helped by the growing number of charities and organisations specialising in educational research with the simple goal of making it more accessible to teachers and schools. Nevertheless, it can sometimes still be tricky to get hold of certain research papers, which may sit behind a paywall, and some teachers still may not be aware of the avenues available to them to access research.

LENGTH AND LANGUAGE

Due to the very nature of our busy roles as teachers and school leaders, having to wade through a 500-page research paper written in the language

of academia may not be that appealing or accessible. Our challenge is to give our teachers access to key studies and theories in bite-sized chunks. Teachers don't need to do the research (it's been done for us and in far more reliable conditions than we could ever construct); they just need to have knowledge of it and use it to increase the effectiveness of their classroom practice. It is the job of school leaders and the educational research organisations mentioned on page xi to filter all the research that's now available to us. They must condense it into easy-to-understand chunks, before helping to develop teachers' understanding of it, so they can adapt their practices accordingly.

CONFIRMATION BIAS

One of the other reasons that teachers may have struggled to engage with research can be explained through confirmation bias theory. This is a cognitive bias that typically involves favouring or searching for information that confirms your existing beliefs. How this plays out in the classroom is that we tend to notice the positive impact of things we believe in already. For example, if you have a deep-seated belief that getting students to work in groups is the best way to structure learning tasks, you'll take heart from every positive that this demonstrates, choosing subconsciously to forget the moments when it negatively interferes with learning. The same also applies when searching for research, or indeed choosing not to search for it. We are far more likely to search for evidence that backs up our beliefs than consciously look for evidence to discredit our beliefs. Therefore, when you believe that a teaching strategy is the best way forward (even if your belief has just been formulated by folklore), you are unlikely to want to challenge your beliefs based on a research study written by a university professor 50 years ago. And, even if you happen to stumble across some research that contradicts your beliefs and assumptions, it can be easy to dismiss because 'it obviously wasn't conducted on the type of students I teach'.

MISCONCEPTIONS OF RESEARCH

One of the major problems with educational research in recent years is that misconceptions can be caused by individuals interpreting the research in different ways and third parties intentionally or unintentionally miscommunicating the findings. In some cases, this is because we try to infer things from the research that were not originally intended (this can be due to confirmation bias), or because we haven't fully understood the purpose or intentions of the study. Quite often this can come from only reading

the headline results and making our own minds up about what the study involved or why the results ended up like they did. In other cases, it can be because media outlets or influential voices take parts of the research findings and twist their meaning, intentionally misleading people to help back up a certain message.

The most commonly cited example of this in education is how schools interpreted the original research from the Sutton Trust in 2011 relating to the fact that feedback is one of the most important and significant interventions that a teacher can use to improve student learning. Schools across the country took this as meaning more marking. But, if you look at the research, it continuously uses the term 'feedback' and not the word 'marking'. What happened was a significant increase on the demands of teachers away from school, marking books and writing copious amounts of comments on every piece of work, only to find out nearly a decade later that the vast amount of written comments that teachers make in student books have 'almost no effect on student achievement' (Wiliam in Hendrick and Macpherson, 2017).

WHAT 'WORKED', NOT NECESSARILY WHAT 'WORKS'

By the very nature of what research is, it reports on what has worked previously, with a strong evidence base to demonstrate its reliability. However, what it doesn't do is accurately predict what will work in the future. Just because something has worked somewhere, it doesn't mean that it will work somewhere else, or even again in the same setting. To help combat this, the term 'best bets' is starting to appear in the language of educational research to help us recognise that results might not always be reproduced perfectly and recommendations are certainly not a guaranteed success; instead the research presents your 'best bet' of helping students learn in your classroom. In the UK, teachers are exposed to these 'best bets' by the *Sutton Trust-EEF Teaching and Learning Toolkit* (Education Endowment Foundation, 2012; https://educationendowmentfoundation.org.uk/evidence-summaries/teaching-learning-toolkit) and in the US, this is supported by the What Works Clearinghouse website (https://ies.ed.gov/ncee/wwc).

CONTEXT

Finally, the biggest problem that teachers have when trying to apply educational research to their own classroom setting is context. Every school is different and, in some cases, classes can be very different from

one another within the same school. This means that it is very difficult to simply pick a piece of research off the shelf, plug it in to your own context and expect it to have the same impact as it did when it was originally trialled and tested. That is not to say that it might not have the same impact, but you need to look very carefully at the specific conditions in which it was set up. Are your conditions the same? And what might have been helping it to work, compared to what might be preventing it from working so well in your own setting? This external validity is crucial when thinking about dropping a piece of research or a strategy that has been borne from that research into your school. In simple terms, how well will this research travel?

Despite these problems, it is essential that we, as a profession, make a concerted effort to engage in the research behind how humans learn. It can be easy to dismiss something because you were too busy to read it or it wasn't trialled with your students, but if we persist in burying our heads in the sand when it comes to the science of learning, we will continue to waste time, energy and money whilst squandering the life chances of the young people in our care.

Now is the time to reboot teaching with the science of learning. Let's reboot our profession together.

HOW TO USE THIS BOOK

Teaching Rebooted aims to provide you with an accessible and concise overview of the main research that underpins how we learn as human beings. The chapters are intended to challenge your thinking, helping you reflect on what you may have been doing in your classroom and the impact of this on student progress and achievement. Across ten chapters, the book provides 40 ideas and strategies to help you turn the 'evidence-based research' presented into 'research-informed practice' the very next day.

Every chapter considers a specific teaching strategy that we know has a firm evidence base and will help guide classroom practice. Although you may wish to read the book from front to back, it is designed to enable you to dip in and out of the various chapters when you need to, depending on the area of research that you may be interested in at any given point in time.

Each chapter in *Teaching Rebooted* follows the same format for ease of use and includes the following sections.

TEACHER 1.0

A frank examination of how we've been misguided in our classroom approach by using common teaching strategies and school policies that may not be in tune with what evidence-based research tells us about how students learn most efficiently and effectively. This section considers some of the bad habits that have developed in our schools, stemming from a lack of awareness about the science of learning.

WHAT DOES THE RESEARCH SAY?

A succinct overview of the main research that underpins the teaching strategy in question and the implications this has for teachers, school leaders, students and parents. Throughout this section, the essential information from the research is highlighted in boxes, so look out for the key symbol if you're really short on time.

TEACHER 2.0

A selection of practical and easy-to-implement ideas that you can use with your students the very next day. These are research-informed strategies that will help you to implement the evidence-based principles outlined in the chapter. There is a total of **40 practical strategies** to pick up and use throughout the book. Each idea ends with a teaching tip to help you put the idea into practice.

Just be aware that implementation is the key to success. Even poor strategies can work to some extent if you put enough time and effort into them. Similarly, if you implement a great strategy poorly, it won't have the impact you were hoping for.

FURTHER READING

Although the main research is broken down into an easy-to-digest summary in 'What does the research say?', each chapter also provides suggestions for further reading. This includes researchers whose work you might want to explore further, reports you may want to read in full and keywords you can put into a search engine if you want to take a deeper dive into the research.

PERSONAL REFLECTION

At the end of each chapter, there are several reflective questions to challenge your thinking. These relate to what you may have done previously in your classroom and how the evidence-based research may influence your classroom practice in the future.