

Speech: Nick Gibb: the importance of an evidence-informed profession

It is a pleasure to be at Buckingham University again, an institution with established values, an emphasis on traditional methods and a determination to influence other institutions.

It is important that the country's most prestigious academic intuitions are engaged in advancing our understanding of education and ensuring the next generation of teachers are endowed with high levels of subject knowledge and evidence of best teaching practice.

I recently [spoke at the Education World Forum](#) in London, which is a gathering of education ministers from around the world. I spoke about the importance of evidence in education and how experts needed to embrace that evidence rather than the comfort of prevailing orthodoxies. Just as with decisions made by teachers in their classrooms, advice given by education experts should be evidence-informed.

Teaching is a deceptively complex art. Every adult in the country has been to school and consequently, everyone has a view of what good teaching looks like. Everyone has a favourite teacher from school. No doubt, some are here today because of an inspirational teacher.

I will always remember Miss Weston from Hornchurch Infant School, my first ever teacher. She impressed upon us all, at the tender age of 5, the importance of standing up for what is right. I guess that's why I went into politics and why I'm standing here today.

And the very best teachers make their craft look easy. To the untrained eye, the underlying complexity and difficulty of teaching is easily missed. To the uninitiated, the wealth of experience and expertise that goes into constructing examples; the moment by moment decision making necessary for successfully managing a classroom; and the intellectual intensity of teaching, is difficult to appreciate.

But for all of this additional difficulty what makes teaching most challenging is its central component; namely, changing what is happening in your pupils' minds and ensuring knowledge and important concepts are retained in their long-term memory. Whether teaching pupils their times tables, explaining the process of longshore drift or teaching pupils to distinguish a between a crotchet and a quaver, teachers are presenting pupils with information that they hope will be transferred to their long-term memory.

Professor Dan Willingham – a cognitive scientist who has greatly influenced my thinking – said that [“memory is the residue of thought”](#) and that it is this accumulation of factual knowledge in long-term memory that enables people to be creative and critical thinkers.

Growing evidence is being gathered by cognitive scientists, and, increasingly, we understand how to maximise what pupils learn and how teachers improve retention of knowledge. We understand that certain classroom activities contain so much distracting information that [pupils experience cognitive overload](#) and therefore information is less likely to be retained. In the words of Professor Willingham:

People are naturally curious, but we are not naturally good thinkers; unless the cognitive conditions are right, we will avoid thinking.

In his excellent '[Why don't students like school](#)' he cites a lesson he observed where a teacher focused so much on making the subject matter relevant to her pupils, that none of them learnt the required knowledge. In a lesson on the Underground Railroad – the secret network of routes and safe houses used by African American slaves to escape to Free States – the teacher had pupils bake biscuits similar to those used for sustenance by escaping slaves. Whilst pupils were clearly engaged in the lesson and were enjoying making biscuits, they were not thinking about the Underground Railroad and therefore were not going to remember the key facts about the event.

Professor Willingham concluded from his observation that pupils had spent 40 seconds considering the relationship between the biscuits and slaves and 40 minutes thinking about making biscuits. It is not hard to imagine what pupils took from this lesson.

There are components of great teaching that cannot be gleaned from reading the evidence. Some of our most memorable teachers had a natural charisma that made their lessons particularly enjoyable. But, as Professor Willingham concludes:

The jokes, the stories and the warm manner all generate goodwill and get students to pay attention. But how do we make sure they think about meaning? That is where the second property of being a good teacher comes in – organising the ideas in a lesson plan in a coherent way so that students will understand and remember.

For a synopsis of the emerging evidence in cognitive science, I recommend Deans for Impact's '[The science of learning](#)'. This short document summarises some key findings from the field. It highlights some practical implications for the classroom and provides links to further reading. The importance of interleaved practice for long-term memory retention is covered, as is the importance of domain-specific knowledge for pupil success when problem solving. The document also debunks some of the common neuro-myths, clarifying that pupils do not have so-called 'learning styles', humans do not only use 10% of their brains and cognitive development does not progress in age-related stages as Piaget asserted.

Debunking the neuro-myths that surround teaching is an important endeavour as

unchecked they can pervade classrooms throughout the country, damaging educational achievement. A decade ago, the neuro-myth of Brain Gym was prevalent in England's schools. In schools afflicted by Brain Gym, pupils were instructed to activate their brains by rubbing so-called 'brain buttons', located in different areas of the body. By having pupils rub their clavicle, various regions of the brain would light up – so went the theory. In the oddest cases, pupils were instructed to slowly sip water in the hope that water would be absorbed into the brain via the roof of the mouth, thus hydrating the brain!

However biologically illiterate this practice may seem to us now, it demonstrates the importance of having a knowledgeable and research-informed profession inoculated from falling victim to this nonsense.

We live in an era of unrivalled technical and scientific enlightenment. But in England, in the 21st century, we have seen teachers taking into account the imagined learning styles of their pupils – such as visual, auditory and kinaesthetic – which is both a waste of effort and can have a negative effect on pupils, according to the Education Endowment Foundation. The EEF, which evaluates teaching interventions using randomised control trials, [concluded the following about learning styles](#):

Studies where teaching activities are targeted towards particular pupils based on an identified learning 'style' have not convincingly shown any major benefit, particularly for low attaining pupils. Impacts recorded are generally low or negative.

It can be particularly damaging for pupils to believe they have a particular learning style, as this can act to prevent pupils learning material that does not fit their supposed learning style. The EEF concluded that "it is particularly important not to label primary age pupils or for them to believe that their lack of success is due to their learning style."

And yet, there are teacher training institutions where learning styles remain on the initial teacher training curriculum.

Barak Rosenshine's ['Principles of instruction'](#) debunks another pervasive teaching myth; the myth of too much teacher-talk. I trust no one here has been told to be a "guide on the side, not a sage on the stage" by this university – an unevidenced trope designed to prevent teachers from spending time talking to their class.

Still today, I occasionally hear of schools and teacher training institutions where teachers are prohibited from addressing the class for more than 20% of the lesson, as if listening to a knowledgeable adult would harm the education of pupils.

The most effective teachers, according to Rosenshine's evaluation of the evidence, do not overwhelm their pupils by presenting too much new material at once. Instead, they intersperse explanations with directed questioning and multiple examples. Consequently, these teachers spend far more time at the

front of the classroom, as Rosenshine explains:

Teaching in small steps requires time and the more-effective teachers spent more time presenting new material and guiding student practice than did the less-effective teachers. In a study of mathematics instruction, the most-effective mathematics teachers spent about 23 minutes of a 40-minute period in lecture, demonstration, questioning and working examples. In contrast, the least-effective teachers only spent 11 minutes presenting new material.

Similarly, many teachers believe that pupils best retain knowledge if lessons are structured in such a way that they discover information for themselves. For many, it is a truism that the best means of teaching pupils is to allow them to discover.

Often, science classrooms are set up for pupils to behave like scientists. Pupils of history are expected to act like historians. It is commonly believed, contrary to what we increasingly understand about the differences between the brains of novices and experts, that by being given the opportunities to behave like historians or scientists, pupils will inevitably become better at science and history. It is not immediately obvious that this is not the case.

However, Richard Mayer's 2004 paper [‘Should there be a three-strikes rule against pure discovery learning?’](#) provides an excellent summary of the arguments against this point of view. Mayer's thesis is that “there is sufficient research evidence to make any reasonable person sceptical about the benefits of discovery learning.”

Concluding his article, he emphasises the importance of applying what we know about how the human brain works to teaching practice:

Thus, the contribution of psychology is to help move educational reform efforts from the fuzzy and unproductive world of educational ideology – which sometimes hides under the banner of various versions of constructivism – to the sharp and productive world of theory-based research on how people learn.

Teaching practice that encourages novice pupils to behave as if they are expert scientists or historians is an example of just this, education theory moving away from research on how people learn. It is hoped that by behaving like experts, pupils will develop the skills and strategies of experts.

Drawing on the work of Michael Polanyi, [Daisy Christodoulou, head of Assessment at Ark, explains](#) that experts spend “hours focussing their attention on tiny details, and learning to recognise differences that completely elude the casual observer. This is not achieved through discovery, but through direction. It is not achieved quickly, but through thousands of

hours of deliberate practice.”

And as Bransford, Brown and Cocking make clear in [‘How people learn: brain, mind, experience and school’](#), novices cannot behave like experts because their brains tackle problems in different ways:

Experts have acquired extensive knowledge that affects what they notice and how they organise, represent, and interpret information in their environment.

Hence, it is not by having pupils behave as if they are experts that will have the best chance of them developing into experts, but rather giving pupils a strong grounding in the knowledge they will need. This knowledge provides a mental framework that pupils can then use and apply to new and novel problems – eventually, after many years of study, allowing them to become scientists and historians in their own right.

Ensuring teachers of the future are equipped with an up-to-date understanding of the latest research and a desire to use evidence to inform their teaching practice is key to improving schools. We must give trainee-teachers a firm foundation of knowledge and a healthy dose of scepticism with which to deal with the next Brain Gym.

In conclusion: Teaching is difficult. It is hard work. It is both challenging and rewarding intellectually and emotionally. And for all of these reasons, it remains one of the most honourable and important professions you can choose. To all of you, thank you for choosing to be a teacher.

Final Estimate of 2015-16 & First Advance Estimates for 2016-17 of Area & Production of Horticulture Crops

The Department of Agriculture and Farmers Welfare has released the Final Estimates: 2015-16 and First Advance Estimates of 2016-17, of area and production of horticulture crops. These estimates are based on the information received from different State/UTs in the country.

'Science Express Should Reach Out to more than Six Lakh Villages of The Country': Anil Madhav Dave

Three Ministers jointly flagged off the 9th phase of Science Express Climate Action Special (SECAS) from Safderjung Railway Station here today. While Minister of State (Independent Charge) of Environment, Forest and Climate Change, Shri Anil Madhav Dave and Union Minister of Science and Technology, Dr. Harsh Vardhan were present at the railway station, Union Railway Minister, Shri Suresh Prabhu, joined the flagging off event through videoconferencing.

Mineral Production during December 2016 (Provisional)

Mineral Production during December 2016 (Provisional)

Group of students from Nagaland call on Dr Jitendra Singh

The Union Minister of State for Development of North Eastern Region (I/C), Prime Minister's Office, Personnel, Public Grievances & Pensions, Atomic Energy and Space, Dr. Jitendra Singh