

Speech

What is a good education in the 21st century?

From: [Department for Education](#) and [Nick Gibb MP](#)
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Schools Minister Nick Gibb explains the importance of a core academic curriculum and the value of excellent teachers.



Can I start by saying thank you for inviting me to come and speak to you today. It is a great pleasure to be back at my old college.

One thing that I miss enormously from my undergraduate days is the time to think, and the time to read. Ministerial duties permitting, I still try to carve out spare hours to enjoy a good book. Ever since becoming Schools Minister, I have been particularly entertained by passages in novels which address English schools.

Zadie Smith's wonderful account of life in modern London, 'NW', features the protagonist Natalie Blake - an upwardly mobile Londoner who goes from her inner-city school to university, and then on to a successful career as a lawyer. Whilst seeking out a primary school for her son, she visits a medieval parish church which has been engulfed in the urban sprawl of north-west London.

A dedicated autodidact, we are treated to Natalie Blake's stream of consciousness as she picks up and reads a leaflet in the church: "...present church dates from around 1315 ... Cromwellian bullet holes in the door...".

Natalie's reading continues: "... the famous shrine of Our Lady of Willesden, 'The Black Madonna', destroyed in the Reformation and burnt, along with the ladies of Walsingham, Ipswich and Worcester - by the Lord Privy Seal. Also a Cromwell. Different Cromwell. Doesn't say. This is where decent history GCSE-level teaching would have come in helpful...".

On reading that passage, I wondered whether Natalie's life is irretrievably held back by her inability to distinguish between Oliver and Thomas Cromwell? Perhaps not. But the situation described in this passage of the novel is indicative of a broader phenomenon: that the recipient of a core academic curriculum leaves school with an intellectual hinterland, which allows them to make sense of the world around them.

Since coming into government in 2010, our reforms to the A levels, GCSEs, and the national curriculum have focused on bringing a new level of academic rigour to English state schooling. And central to this mission has been elevating knowledge to become a central component of a good school education.

Had Natalie studied for the new reformed history GCSE, due to be taught from September 2016, she would have stood a better chance of knowing about both Oliver and Thomas Cromwell, thus having the knowledge to understand the historical significance of her parish church.

‘Knowledge’, I hear people gasp. ‘Surely education is about so much more than that. It is about creativity, problem solving, thinking critically, and inventing?’.

Yes, I agree whole-heartedly that a good education is about all those things. But each of them is dependent upon, and impossible without, a fundamental basis of knowledge about the subject in question. Put simply, a commitment to social justice requires us to place knowledge at the heart of our education system. And this is not a statement of opinion – it is a fact established by decades of research by cognitive scientists, as I shall soon explain.

It is an unfortunate fact, however, that many modern conceptions of education either ignore the importance of knowledge, or actively deride it. During the 1960s, it became fashionable amongst educationists to dismiss the accumulation of knowledge as a joyless anachronism: rote learning of unconnected facts, inflicted upon bored and unwilling pupils. School curricula were increasingly rewritten to focus not upon subject content, but upon skills and dispositions.

History became less about mastering the understanding of a period, and more about analysing primary sources. Foreign languages teaching moved away from learning grammatical structures and a wide vocabulary, and towards communication. And in maths, it was believed that memorisation of times tables and basic arithmetic at an early age could be bypassed by learning through real-life mathematical problems.

This philosophy endured and strengthened over the next half century, and had a marked effect on the quality of education that generations of children have received in Britain. For me, the crowning glory of this dumbing down was the 2007 rewrite of the national curriculum, which systematically expunged any mention of subject content, replacing it with references to ‘processes’, ‘concepts’, and with an overlay of ‘personal, learning and thinking skills’ such as ‘independent learning’ and ‘learning to learn’.

As Schools Minister, I have visited around 400 schools, watched

thousands of classes, and seen countless examples of this philosophy in action. It always saddens me to see thrilling content of education, be it timeless literature, scientific wonders, or great historical events, being relegated to a backseat, so that these comparatively joyless 'skills' and 'processes' can come to the fore.

Now, I am sure that many here may be thinking back to their own recent education, and contending that you studied a core, subject-based academic curriculum at school. If that is the case, you should feel fortunate that you were part of a minority.

On entering government in 2010, we were concerned that nationwide only 31% of pupils were taking a GCSE in history. Only 26% of pupils were taking a GCSE in geography. Worse still, only 43% of pupils were studying a GCSE in a foreign language, down from 76% in 2000.

We saw that the majority of English pupils were not studying a combination of academic subjects which - up to the age of 16 - would be seen as entirely standard at most independent schools, and indeed in many foreign countries.

And even for those who did enter GCSEs in academic subjects, the examination content had been so watered down that it no longer represented a mastery of any given subject. A history GCSE could consist entirely of 20th-century topics; a religious studies GCSE could consist of just 1 religion, or very little religion at all; and around 90% of pupils entering the English literature GCSE delivered by 1 exam board answered questions on a single text: 'Of Mice and Men'. Now, John Steinbeck is a great author - 'East of Eden' is my all-time favourite novel - but even I doubt this short novella was deserving of such overwhelming attention.

In addition, grade inflation had been allowed to diminish the value of our qualifications. From 2005 to 2010, the proportion of pupils achieving 5 good GCSEs increased year on year. But as Professor Robert Coe of this university showed, English pupils' performance in international assessments and annual benchmarked aptitude tests showed no improvement at all.

This was the state of English education that we inherited on coming into government in 2010. Since then, our reforms have focused on raising the ambition of what pupils are expected to study at school, and putting subject content - which I believe to be the real joy of education - at the core of school life.

We have removed over 3,000 low-value qualifications from performance tables and introduced rigorous new standards for the technical and professional qualifications that remain.

We introduced the English Baccalaureate (EBacc) measure in 2010, which shows the proportion of pupils in a school being entered for a combination of GCSEs in English, mathematics, 2 sciences, history or geography, and a foreign language. Schools have risen to this challenge: the proportion of pupils entering this EBacc combination of subjects nationwide has risen from 23% in 2012 to 39% in 2015.

And due to a long process of examination reform which is only just coming to fruition, the examinations that children are taking are becoming more academically ambitious, not less. Since September, pupils have been studying the reformed English literature GCSE for the first time, including the study of both a 19th-century novel and a modern text. Instead of a strict diet of Steinbeck, pupils can read George Orwell and Jane Austen, Kazuo Ishiguro and Charlotte Bronte - and they will be reading the whole novel, not just extracts.

From September, the new history GCSE will be studied, which will supplement 20th-century global history with British depth studies, from the reign of King Edward I to the English Civil War and Restoration.

Our curriculum reforms also look to the future, as the school curriculum must adapt to incorporate the breakthroughs of the technological age. That is why we have introduced a new national curriculum for computing, which focuses on programming languages, computational thinking, and Boolean logic - making this country, I believe, the first in the G20 to do so. The old IT curriculum simply taught children to use programmes such as Microsoft Word: now, pupils are learning to code and

create programmes for themselves.

This culture of increasing academic ambition is having a beneficial knock on effect for A level studies, where since 2010 there has been a 27% increase in pupil entries for further maths, a 15% increase in pupil entries for physics, and a 15% increase in pupil entries for chemistry.

Non-STEM (science, technology, engineering and mathematics) subjects are seeing similar increases at A level. Economics, up 29%. Religious studies, up 19%. Spanish and geography, both up 16%. Whilst for years, comments about 'the youth of today' have implied decline and disappointment, today's youngsters will be better educated and better informed about the world than the generations preceding them.

In England, it has always been possible to secure a good education, through top comprehensive schools, grammar schools or independent schools. But it is socially disadvantaged pupils who have historically missed out, and found their life chances limited by the quality of education they received. Research by the Sutton Trust in 2014 showed that pupils eligible for free school meals who scored in the top 10% nationally at the end of primary school were significantly less likely to be entered for the EBacc than their wealthier peers who achieved the same level aged 11. Disadvantaged pupils - the very children most in need of an academic, knowledge-based curriculum - were the least likely to be given the opportunity to benefit from it.

It is the driving ambition for this government that a core academic curriculum should not be the preserve of a social elite, but instead the entitlement of every single child. Though there are some inequalities which schools cannot address, the unequal distribution of intellectual and cultural capital is one that they can.

But there remain many working within education who would challenge my assumption that a core academic curriculum is a valuable inheritance for all pupils. Such figures think it superfluous to know, for example, Oliver Cromwell from Thomas. I am sure many here will have seen the Royal Society of Arts

talk by the educationist Sir Ken Robinson, now pushing 14 million views on YouTube. In his talk, he accuses the traditional, academic curriculum of being a relic of the 19th century, a 'factory model' of schooling, which squanders pupil creativity.

As his enormous popularity shows, Sir Ken Robinson's views are superficially appealing. But I believe them to be profoundly wrong.

An educationist who has shaped my thinking on this more than any other is Daniel Willingham, professor of cognitive science at the University of Virginia. With reference to robust scientific evidence, he explains how the 'thinking skills' most prized by schools and employers - problem solving, creativity, inventiveness - are dependent upon considerable background knowledge.

You may suppose that 'thinking scientifically' is a discrete skill, that when learnt can be applied to any new context, but this is not the case.

To give one of the many examples that Professor Willingham cites, in one experiment, eighth-grade pupils in America were given 2 tasks. In 1, they had to manipulate a computer simulation to keep imaginary creatures alive. In another, the pupils had to evaluate how the surface area of swimming pools was related to the cooling rate of its water.

Students were consistently better at thinking scientifically on the first problem, rather than the second - something that the researchers attributed to pupils' greater familiarity with the relevant variables. In general, American eighth-graders are better informed about health and survival, compared to volume, surface area and cooling rates.

And it is a well-known principle that great inventions are made, not through a moment of pure inspiration, but through analogical thinking. The 'eureka moment' of any great invention occurs when existing knowledge is brought to bear in new contexts: the novel application of what is already known.

Alexander Graham Bell's first diagrams for the telephone made explicit reference to the biological structure of the human ear. George de Mestral invented Velcro through looking at the tiny hooks of the cockle-burs which stuck to his dog's fur when he was hunting in the Alps.

This insight, that complex thinking depends upon background knowledge, can be applied to any subject of study.

It underlies our recent announcement that all pupils will be tested on their multiplication tables at the end of year 6, an announcement which was strongly opposed by the General Secretary of the National Union of Teachers. She expressed the classic anti-knowledge view, suggesting that number recall is not necessary for understanding mathematical concepts, and arguing that children today can always look up their times tables on their mobile phones.

Such a position is called into question by 5 decades of research by cognitive psychologists, which shows that pupils and adults who are able to solve complex mathematical problems, also have strong recall of their times tables and basic arithmetic. This should not come as a surprise - it is far easier to simplify the ratio 21:63 when you instantly recognise that both numbers are divisible by seven.

In 2013, a controlled trial was carried out where 195 first grade pupils in America who were struggling with mathematics were given 16 weeks of specific tutoring where they practiced their number knowledge. The pupils were then tested on areas such as word problems, simple arithmetic and 2-digit calculations. Compared to the control group who received no such tutoring, these pupils had a statistically significant improvement in all 4 areas tested.

Number knowledge tutoring does improve maths ability and the repeated practice of simple arithmetic helps pupils to solve more complex mathematical problems. Yet some educationists still insist that such practices are old-fashioned and unpleasant for pupils, and impoverish the education that our pupils receive. Little better exemplifies the unwitting cruelty of good intentions.

The anti-knowledge - and, I would argue, anti-evidence - position in education debates has, in recent years, been bolstered by the advent of the internet. One well known educationist shot to fame a few years ago with a popular TED talk, extolling the ability of pupils to learn independently from the internet. He asked in his talk: 'if there's stuff on Google, why would you need to stuff it into your head?', and added 'I decided that groups of children can navigate the internet to achieve educational objectives on their own.'

However, according to research from academics such as Professor Hattie, web-based education has so far been a great disappointment in raising education standards. This is backed up by international evidence from the OECD which shows that increased internet use in schools does not lead to higher academic outcomes. The 5 countries where pupils spend the least time using the internet in school - Poland, Japan, Hong Kong, Shanghai and South Korea - are all amongst the world's highest achieving jurisdictions in international tests.

Now, I am a great supporter of the intelligent use of computers in schools, but it is mistaken to believe you can outsource your memory to Google and still expect to think well. Say, for example, you are reading an article about nuclear energy, and come across an unfamiliar term: radiation. So you Google it. But the first paragraph on the Wikipedia article mentions another unfamiliar term: particles. So you look it up, but the definition for 'particles' uses another unfamiliar term: 'subatomic'. The definition of which in turn contains the unfamiliar terms 'electrons', 'photons' and 'neutrons', and so on and so forth in an infinite series of google searches which take the reader further and further away from the original term 'radiation'.

It is no more possible to think fluently on a given topic with the help of the internet, than it is to talk fluently in a foreign language with the help of a bilingual dictionary.

As cognitive psychologists such as Daniel Willingham explain, the interaction between long-term and working memory is foundational to how we learn. Our working memory can only cope with between 5 and 7 new pieces of information at once. All

other information must already reside within long-term memory for new information to be assimilated, or else cognitive overload is the result. This is precisely why it is so difficult for a novice to learn new information by browsing articles on the internet.

Many of us here will have a rough understanding of the structure of atoms, and the science behind radiation. We have known about it for so long, that we tend to take for granted. That, and so many other bits of factual knowledge that we draw upon in our daily life, reside in our long term memory because once, in the dim and distant past, a teacher took the time to teach it to us.

From talking to officials and teachers who have visited schools in the Far East, it is clear that countries such as China and Singapore have a pronounced pro-education culture. But I worry that in the West, we can have a tendency to disparage the importance of school. People like to quote great intellects, such as Mark Twain, who stated 'I've never let my school interfere with my education', or Albert Einstein who purportedly, but probably didn't, say 'education is what remains after one has forgotten what one has learned at school'. I could not disagree more strongly: a good education is transformative, and I am sure everyone in this room can think of at least one teacher who changed the direction that their life has taken.

When I defend the merits of an academic curriculum, I am often assailed with the same argument: 'I learnt all about algebra at school', or 'I learnt all about atoms and radiation, and have now forgotten the lot. What use has it been?' To that argument, I would have 2 answers.

Firstly, when knowledge recedes from instant retrieval in our memory, it still remains logged in our long-term memory.

This is shown by a cognitive principle is known as savings in relearning. Say, for example, that 15 years ago you gain an A grade in GCSE Spanish, but have forgotten it all in the intervening years. Ten years later, you find yourself working in Spain. You will have to learn Spanish again from scratch, but will it be easier second time round? Your intuition may say yes, and it would be correct.

This phenomenon has been confirmed by researchers in Japan. Japanese missionaries, who had spent time doing working in Korea up to 45 years previously, were tested on Korean words. They were then made to learn those that they did not get correct. At the same time, they were made to learn pseudo-words to act as a control. The former missionaries relearned the Korean words much more quickly, even though the initial test suggested they had been forgotten. This shows that a residue of knowledge remains in the mind even when it can no longer be recalled.

But even if you never relearn content learnt at school, I would maintain that such content was not learnt in vain. Perhaps you are now firmly attached to your English literature degree, and resent all of those hours spent learning about enzymes, ecosystems and eukaryotic cells for your biology GCSE.

But at the age of 14, would you really have been in a position to decide where to specialise? Being exposed to a broad and encompassing academic curriculum at a young age is a great privilege, as it enables you to make an informed decision about which paths you wish to pursue later in life.

On this point, I often consider the novel 'Of Human Bondage' by Somerset Maugham. In a story based on Maugham's own difficult youth, which was full of failures and false starts, the protagonist studies German in Heidelberg, he studies to be a painter in Paris, he works as an accountant and a dressmaker, before finally realising his calling to be a doctor.

In his first anatomy lecture at medical school, the lecturer tells the young students: "You will have to learn many tedious things, which you will forget the moment you have passed your final examination, but in anatomy it is better to have learned and lost than never to have learned at all."

I think that Maugham was onto something. What is true in anatomy, is true in wider life. The lecturer was, of course, paraphrasing Tennyson's famous couplet in his poem 'In Memoriam', that it is better to have loved and lost than never to have loved at all.

As such phrases demonstrate, great poetry has a remarkable ability to etch itself into the conversation of society. Thomas Gray's poem 'Elegy Written in a Country Churchyard' is, I believe, one of the most moving poems in the English language. Its verses lent the title to both Thomas Hardy's novel 'Far From the Madding Crowd', and Stanley Kubrick's film 'Paths of Glory'.

Much like Natalie's visit to a medieval church in 'NW', Thomas Gray's poem was inspired by an evening looking at a graveyard, which sets his mind wandering. In particular, he regrets the potential that must be squandered when people are brought up in poverty and in ignorance - this was 1751, a long time before universal state education. As he puts it: 'Knowledge to their eyes her ample page | Rich with the spoils of time did ne'er unroll'. Gray suggests that within the country graveyard, there may be 'some mute inglorious Milton', whose lack of a good education forever left his potential untapped: 'Full many a flow'r is born to blush unseen'.

It is this thought that animates me most as Schools Minister: the generations of school children whose potential was squandered by schools which never taught them the rudiments of literacy and mathematics, which never challenged them to read timeless works of literature, which fobbed them off with so-called vocational courses when they were more than capable of benefiting from a core academic curriculum or high-quality technical and vocational qualifications.

Our education system should be an engine of social mobility, extending opportunity to every young person, ensuring that they reach their potential.

We have already made significant progress in building an education system which delivers on that vision. But we have further to go, and you could help realise that objective. I think the final message I would like to give today, particularly to the undergraduates in this room, is of the joys of being a teacher.

I have always hated that lazy saying, 'if you can't do, teach'. My mother was a primary school teacher, and I am a profound believer that teachers have the power to change children's lives.

The thought that always strikes me when I see an inspiring teacher, communicating the subject that they love with warmth and passion, is what a remarkable and difficult craft effective teaching can be.

Great teachers are masters of their subject, who tell stories, impart wisdom and inspire curiosity. They motivate, cajole and guide pupils to surpass their own expectations of themselves. And evidence suggests that teaching is finally gaining the status it deserves in this country.

In 2010, 61% of trainee teachers had an undergraduate degree at level 2:1 or above. This year, that figure is 74%. Crucially, in 2012 the proportion of trainee teachers with a 2:1 or above surpassed the national average of that year's graduating cohort for the first time. The annual initial teacher training census shows us that the proportion of new teachers holding a first-class degree is at an all-time high.

To ensure that the calibre of teachers keeps on improving, we have expanded schemes such as Teach First, which this year has sent over 1,500 teachers to work in primary and secondary schools serving low-income communities in every region of England. Teach First is now the single largest graduate recruiter in the UK, a remarkable achievement.

Since 2010, we have put teachers in the driving seat of our reforms to improve state education in England. We have given schools, and teachers, unprecedented freedom to teach as they see fit, without an overbearing education bureaucracy driving their actions.

To this end, we have removed 21,000 pages of unnecessary school guidance, reducing the volume by 75%. In addition, teachers who believe that they are able to create something better within the state education system than the status quo, are now empowered to do so through the free schools programme, which is providing outlets for idealism across the country.

We are working to create a teaching profession which recognises talent and ambition, as well as time-served. We have funded

targeted programmes to develop excellent teachers for challenging schools, such as High Potential Senior Leaders, currently delivered by Future Leaders. For bright and ambitious young graduates, a career in teaching now offers rapid advancement opportunities to rival any other profession.

I genuinely believe that there has never been a better time to become a teacher. So if you love your subject, and want to share that love with eager young minds, then there can be few better careers for you than teaching. And if you do not, then at least be thankful of the enormous privilege it is to be the recipient of a good education.

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