

[News story: University of Edinburgh to become centre of excellence for cyber security research](#)

- Scotland to get its first Academic Centre of Excellence in Cyber Security Research
- Edinburgh joins Warwick amongst 14 centres announced across the UK
- Cabinet Office: Research centres will ensure we build the capabilities to tackle cyber threats

Ben Gummer, Minister for the Cabinet Office, visited the University of Edinburgh to praise its efforts in becoming the first such centre in Scotland to gain the accolade – making it one of the leading establishments in this growing field of work.

Chosen from more than 20 applicants from across the UK, the 14 selected universities are:

- University of Birmingham
- University of Bristol
- University of Cambridge
- Lancaster University
- Imperial College London
- Royal Holloway University of London
- University College London
- Newcastle University
- University of Oxford
- Queen's University Belfast
- University of Southampton
- University of Surrey
- University of Warwick
- University of Edinburgh

As announced in the Government's [National Cyber Security Strategy](#) last year, Academic Centres of Excellence will specialise in developing the latest cyber security techniques and contribute to the UK's increased knowledge and capability in this field.

All are now recognised by the National Cyber Security Centre (NCSC) – launched in February 2017 in London – as meeting the tough minimum standards required:

- commitment from the university's leadership team to support and invest in the university's cyber security research capacity and capability
- a critical mass of academic staff engaged in leading-edge cyber security research
- a proven track record of publishing high-impact cyber security research in leading academic journals and conferences

- sustained funding from a variety of sources to ensure the continuing financial viability of the research team's activities.

The NCSC looks forward to working with these 14 universities over the next five years to continue to grow UK academia's capacity and capability in cyber security research and to cement its position as an international leader in this area.

With NCSC-approved research moving into Scotland for the very first time at the University of Edinburgh, the Minister gave an address to students on the campus, and spoke to leading academics about their work.

Universities will have Centre of Excellence status for five years from June 2017 before assessments are carried out again.

Ben Gummer, Minister for the Cabinet Office & Paymaster General, said:

This Government is determined to make the UK the safest place in the world to live, work and do business online.

That is why we need truly ground-breaking research to stay one step ahead of the growing threat of cyber attacks. I am pleased to announce the University of Edinburgh as the latest academic institution to contribute their expertise to this vital field, joining thirteen other universities from around the country.

By engaging with business, industry and academia, we will ensure that we develop the skills and research we need to tackle this growing threat to the UK.

Chris Ensor, Deputy Director for Cyber Security Skills and Growth at the NCSC, said:

It's fantastic to see so many leading universities committed to trailblazing improvements to the UK's cyber security research, and it is particularly good to see Scotland represented for the first time.

At the NCSC, we are absolutely committed to maintaining and improving our already strong reputation as a global leader in cutting edge research, and look forward to collaborating with these establishments to make the UK the safest place to live and work online.

These universities conduct world-class cyber security research and this initiative will improve the way academics, government and business work together – benefiting the whole of the country.

Professor David Aspinall, of the University of Edinburgh's School of

Informatics, said:

Cyber security and privacy is now an essential aspect of modern life which impacts the technology we see and use, as well as the behind-the-scenes technology we rely on that supports the physical and virtual infrastructures.

Our recognition as a centre of excellence will bring fresh impetus to our research, to help make the digital world safer for everyone.

Underpinned by £1.9 billion of investment, the National Cyber Security Strategy sets out the Government's key cyber security objectives:

- deter hostile action against the UK
- defend the UK against evolving cyber threats
- develop the cyber security industry, create a self-sustaining pipeline of talent into the UK

Investment into cyber security is almost doubling in order to meet the growing threat and to build the infrastructure necessary to put UK cyber security on a sustainable footing.

All universities which are recognised as an Academic Centre of Excellence in Cyber Security Research have met rigorous criteria which assess the quantity and quality of their researchers, their research output and the impact of their research. All of the successful universities have invested considerable capital – financial, intellectual, managerial, leadership and so on – over years to grow their capacity and capability to the point where they meet the standards for recognition.

The Universities of Edinburgh and Warwick join the list for the first time. The remaining 12 have all successfully had their applications for Academic Centre of Excellence status renewed since the scheme was first established in 2012.

The UK Government would be delighted to see more universities recognised as Academic Centres of Excellence and, to this end, the NCSC has committed to working with unsuccessful applicants to provide guidance and encouragement to help them work towards submitting another application in future years.

[Press release: Secretary of State visits HMP Onley to meet staff and see](#)

reform in action

The Warwickshire-based establishment this week launched the Ricoh training centre at the prison, which will give offenders the opportunity to gain digital media qualifications and get a job with the firm on release.

This follows the successes of the prison's Halfords bicycle academy, which provides trainees with repair and maintenance skills. More than 30 offenders from the prison have gone to achieve employment with the company.

Rehabilitation is a crucial part of the Justice Secretary's Prisons and Courts Bill, which outlines that a key purpose of prisons is to reform offenders so they stop committing crime.

Justice Secretary Elizabeth Truss said:

I have always been clear that as well as punishing offenders, our prisons must become places of safety and reform. We must do all we can to give prisoners the best chance to turn their lives around.

There is some fantastic work going on across the prison estate and I am delighted that the innovative schemes formed by the hardworking and dedicated staff at HMP Onley are having a positive impact on lives.

Tackling the risks of reoffending will help reduce the £15 billion annual cost it has to society and reduce the turmoil faced by people who become victims of crime, therefore creating safer communities.

Since taking up post, the Justice Secretary has taken immediate action to boost safety, announcing £100m a year to recruit 2,500 prison officers to bolster the frontline and increase staff numbers.

A further £10m has been invested for increased security measures in a number of prisons. HMP Onley received £160,000 and has used the money to increase CCTV and on the wings and bringing in staff with specialist security and safety training.

Staff at HMP Onley have built relationships with local businesses, such as Halfords and the Ricoh, to explore opportunities for prisoners to gain training and employment.

This is an example of governors being empowered to take control over how they run their establishments – a key commitment in the Prison Safety and Reform White Paper.

Notes to editors:

Progress made on key reforms so far includes:

Recruitment and retention

- boosting pay for hard-working staff by up to £5,000 at some of the most difficult-to-recruit prisons and those with high levels of staff-turnover
- appointing 75 mentors for new starter prison officers to help them in their first few months in the job which we know can be a difficult time;
- starting targeted local recruitment initiatives at 30 sites so that governors can more easily recruit the people they need;
- launching a new Prison Officer apprenticeship scheme next year for over 1000 new officers that will help increase diversity and make it easier to join the prison service.
- developing a new graduate scheme that will encourage people from a broader range of backgrounds to join the service;
- we have set up a Troops to Officers scheme that will support people to join the prison service after leaving the military.

[News story: New water choice for English businesses](#)

The world's biggest competitive water market officially opened on April 1st, which for the first time gives more than 1.2 million businesses, charities and public sector bodies the chance to choose their water provider wherever they are in the country.

Environment Secretary Andrea Leadsom welcomed the launch of the market, which will deliver up to £200 million of benefits to the economy and water customers over the next 30 years, through improved service and better value for money.

By opening the market, companies ranging from businesses with very few employees to multinationals, as well as charities and public sector organisations, will be able to shop around for the best deal from all water utilities in England.

Environment Secretary Andrea Leadsom said:

Over a million businesses, charities and public sector organisations will now be able to find the water deal that works best for them. Opening the market is an historic milestone, paving the way for innovation and efficiency and giving customers the same choice over their water retailer as they currently have for their energy and other essential services.

Defra has worked with partners Ofwat, which will regulate the new market, and Market Operator Services Ltd (MOSL), which will operate the market on behalf of its water company members, to ensure there is a smooth transition for customers.

Ofwat Chief Executive Cathryn Ross said:

Business customers have been crying out for choice over their provider of water and waste water services for years. From today businesses, charities and public sector organisations in England will be able to choose their retailer to get a better deal.

The opening of the business retail market takes us into new territory. It is the single biggest change to the water sector since privatisation and I am hugely optimistic about the changes that lay ahead and the benefits they will bring to customers.

But it is important that we at Ofwat maintain effective oversight of how the new market is working and what customers are experiencing. This will mean that we can step in if we need to, to make sure customers are protected.

MOSL Chief Executive Ben Jeffs said:

This launch marks the successful delivery of the largest and most complicated transformation programmes undertaken by the water sector since privatisation. Delivering a programme of this scale and complexity has involved a huge team effort across Government, Ofwat and the entire industry.

Competition not only offers non-household customers the prospect of a better price for a better service, it will create new opportunities and challenges for the sector as a whole. The level of engagement we have had to date has been exemplary and, as the market operator, we look forward to working with companies to ensure the new market delivers on its promise to customers.

The new market in England now becomes the biggest of its kind in the world

and Defra will continue to support the water sector as the market develops.

Scotland is the only other country with a competitive water market for businesses and this government has been working closely with its Scottish partners in the lead-up to the opening to draw from their learnings and expertise.

Businesses, charities or public sector organisations interested in changing their water retailer should shop around. There is more information available about available water retail suppliers on the [Open Water website](#).

[News story: Institute for Apprenticeships to ensure quality skills training](#)

The new [Institute for Apprenticeships](#) will start its first official working day today (3 April 2017).

Independent from government, the institute, which is to be chaired by Antony Jenkins, has been launched to ensure that all apprenticeships are top quality and deliver the skills that employers need. It will further support the government's commitment to deliver 3 million quality apprenticeships by 2020.

High-quality apprenticeships are an important part of the government's plan for Britain and the institute marks an important milestone in working with businesses to invest in the home grown-skills our country needs.

To ensure employers are at the heart of every decision, the institute has appointed leading figures in the business world to sit on its board. This will ensure that employers needs are being met and they have the opportunity to review and challenge apprenticeship standards and how apprenticeships are assessed.

Skills and Apprenticeships Minister Robert Halfon said:

I am delighted that today marks the first working day of the Institute for Apprenticeships. This is a key part of the jigsaw that will ensure employers get the skills their workforce needs.

With the apprenticeship levy coming into force later this week, we are truly working together with business to invest in home-grown skills and ensuring people of all ages and all backgrounds get their foot on the ladder of opportunity.

Chair of the Institute for Apprenticeships Antony Jenkins said:

The institute is now formally up and running. As an employer-led organisation we will be well informed and responsive to the evolving skills that they need to succeed and that our apprentices need to fulfil their potential.

The institute launches ahead of the apprenticeship levy coming into force on Thursday (6 April 2017). The levy will double the annual investment in apprenticeships to £2.5 billion by 2019 to 2020. This will ensure that every person, regardless of their background, gets the chance they deserve to succeed.

Latest figures show that there is currently the highest numbers of apprenticeships on record with 900,000 apprentices last year alone. 90% of apprentices get employment or progress to additional education.

[Speech: Nick Gibb: empowering teachers to deliver greater equity](#)

It is an honour to open the [International Summit on the Teaching Profession](#). This conference provides an excellent opportunity for politicians, unions and teacher representatives from the nations of the UK and countries from around the world to discuss how we can further improve education.

Empowering teachers to provide a great education for their pupils is at the heart of what I do as School Standards Minister. Increasingly, we know what can be done to improve educational outcomes for all pupils. Improving outcomes is not simple, but the principle underlying important reforms is: knowledge is power.

Knowledge of evidence about effective teaching practice; knowledge of cognitive science research into memory; and a knowledge-rich curriculum that empowers all teachers to deliver improved educational outcomes for all pupils.

Increasingly, education research is exposing outdated theories that still abound in many circles. In their 2013 paper [Urban legends in education](#), Kirschner and Van Merriënboer expose 3 prevalent education myths linked to the fallacy that pupils should direct their education and not teachers.

These 3 myths conflict with knowledge of cognitive science and best teaching practice. Providing teachers with this myth-busting research improves their knowledge and empowers them to deliver high-quality lessons.

The first myth is that pupils today are 'digital natives' and, consequently, their education should involve immersion in digital technology. However, Kirschner and Van Merriënboer's paper concludes that a pupil's education might suffer if teaching tries to play to the perceived technical aptitude of millennial pupils.

The second myth is that pupils have unique learning styles and that education must be tailored to the learning style of each pupil. In my experience, this is a particularly persistent myth in schools in England.

The Education Endowment Foundation – an independent charity set up by the government in 2011 to find out what works in education – [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.

Kirschner and Van Merriënboer conclude similarly that:

Though very appealing, there is no solid evidence that learning styles—as such—actually exist and that there is any benefit to adapting and designing education and instruction to these so-called styles.

In accordance with the EEF, they also remark that teaching to the perceived learning styles of pupils may have a negative effect on the outcomes of pupils.

The third myth is all that one needs to know and learn is that teaching knowledge is redundant because children can now find out whatever they want with the click of a mouse. The corollary of this belief is that teaching should instead focus on generic skills and competencies.

This myth still abounds at international education conferences – as many people here will know. Now that pupils have a seemingly unlimited amount of knowledge stored on their smart phone devices – so goes the argument – all that is required is to ensure pupils learn how to learn.

This myth is intuitively appealing given the technological boom we are living through now, but this argument is not new. In 1914 it was argued that:

Educated people are not those who know everything, but rather those who know where to find, at a moment's notice, the information they desire.

It was wrong in 1914 and it is wrong now. As [ED Hirsch wrote in 2000](#):

There is a consensus in cognitive psychology that it takes knowledge to gain knowledge.

Knowledge begets knowledge. It does not suffice to provide pupils with tools to find knowledge. Decades of research tells us that in order to make sense of and retain new information, pupils must have pre-existing knowledge with which to link this new information.

Ensuring teachers have access to high-quality research empowers them to deliver lessons that avoid falling for these alluring, but fallacious myths, improving educational outcomes for all pupils.

Many of the myths that pervade education use the context of the 21st century as justification. Teachers are told that this new millennium requires an education that gives pupils freedom to problem solve, so that they develop the skills they need to be successful in modern economies.

Teachers, it is argued, should step back and facilitate problem-solving activities and allow pupils to hone their critical thinking. But the evidence against this position is now overwhelming, and we must ensure that teachers are exposed to this evidence.

For example, [research conducted in Holland](#) by Kroesbergen, Van Luit and Maas compared outcomes for low-achieving pupils split into 2 groups. One received teacher-led instruction, the other was taught using a child-centred method. The experiment considered the automaticity of pupils and their ability to problem solve. Pupils provided with explicit teacher instruction significantly outperformed their peers in that experiment.

And similar results have been replicated the world over. Klahr and Nigam from the University of Pittsburgh, [investigating the relative effects of direct instruction and discovery learning](#) found:

Not only that many more children learned from direct instruction than from discovery learning, but also that when asked to make broader, richer scientific judgments, the many children who learned about experimental design from direct instruction performed as well as those few children who discovered the method on their own. These results challenge predictions derived from the presumed superiority of discovery approaches in teaching young children basic procedures for early scientific investigations.

And the [2015 PISA results](#) – which examine the ability of pupils to solve scientific problems – also support this finding. In all but 3 countries, pupils reporting higher levels of teacher-directed instruction achieved significantly better results. In the majority of countries, pupils reporting higher levels of enquiry-based instruction achieved significantly worse results.

The research is clear on this point: it is not by allowing pupils to behave

like scientists in lessons that they are best prepared to become the scientists of the future. It is by being taught scientific knowledge that pupils are best prepared to become the scientists of the future. Standing on the shoulders of giants first requires you to climb up to their shoulders.

Providing teachers with access to this pedagogical research is critical to improving outcomes. Not only does the research increasingly show what works best, we are beginning to understand why this works best. And this understanding is critical to improving not just outcomes, but equity too.

Thanks to our greater understanding of cognitive science, we know that people have very limited working memories, allowing them to hold 3 to 7 pieces of information at a time. However, our long-term memory is limitless – for all practical purposes. Hence if teachers want pupils to be able to solve problems or think critically about a topic, it is important that pupils already have domain-specific knowledge about this topic stored in their long-term memory.

[Sweller's seminal work on cognitive load](#) demonstrated the importance of domain-specific knowledge for pupils to successfully solve problems. This area of research supports the view that designing a knowledge-rich curriculum that ensures pupils are taught a broad range of knowledge, best prepares pupils to solve problems by applying their knowledge.

[Bruner and Ross's earlier work on problem solving](#) had already demonstrated the importance of guiding pupils away from mistakes when helping young children to solve problems – hence reducing the cognitive complexity of solving a novel problem. Amongst the other important features of instructing children to solve a problem, Bruner and Ross also highlighted the importance of highlighting critical features of a problem and modelling solutions to a task – both key features of high-quality teaching.

And the knowledge underpinning teacher-led instruction has now been disseminated into general [principles of instruction](#) that teachers can easily refer to when designing lessons.

Knowledge is power for teachers. But it is also power for pupils.

Ensuring all pupils have access to the knowledge they need is a question of improving educational outcomes and equity. In England, the government has placed an emphasis on ensuring all pupils are taught a knowledge-rich curriculum.

The Sutton Trust – a respected charity that champions social mobility – [has recently produced evidence](#) that in England high-ability disadvantaged pupils are less likely than their more advantaged peers to attend a school that teaches a stretching academic curriculum. Equally, the Sutton Trust has produced [evidence suggesting that schools pursuing a curriculum](#) that prioritises an academic core of subjects is beneficial for pupils – particularly those from disadvantaged backgrounds.

[Blanden and Macmillan](#) – examining inequality and social mobility – suggested

that focusing on standards alone was not enough to encourage social mobility. Instead, focus should also be given to spreading access to the most high-value qualifications.

In England, the government has incentivised secondary schools to teach pupils English, maths, at least 2 sciences, either history or geography and a foreign language, so that more pupils – irrespective of background – take these high-value qualifications at age 16. Not only do these qualifications provide pupils with a broad academic education, but they also facilitate access to the best universities in the country.

In order to improve standards and improve equity, it is imperative that all pupils – irrespective of background – are taught a broad knowledge-rich, academic and high-status curriculum covering the core academic subjects mentioned above alongside a rich arts education that gives pupils a deeper appreciation of their culture.

Knowledge is power. We must empower teachers to pursue well-evidenced teaching methods. We need to ensure teachers have up-to-date knowledge of cognitive science and the implications for what and how to teach. And we need to design knowledge-rich curricula so that pupils are given the greatest opportunity for success.

Thank you.