

DESIGNED AND MADE IN BRITAIN...?

Design and Technology
in schools is critical to
the UK's future success.

Act Now!

With the introduction of the National Curriculum in 1989 England and Wales were the first countries in the world to establish D&T as a statutory entitlement for all pupils. It is ironic that whilst our achievements in D&T education are seen as world-leading and worthy of replication in other parts of the world, they come under repeated question in the UK.

What are the issues?

Critical shortage of qualified D&T teachers

- Uncertainty about D&T teaching career prospects and status caused by successive curriculum changes.
- Recruitment into D&T Initial Teacher Training (ITT) 50% below target for the last 2 years.
- At least 1,200 fewer secondary D&T teachers in the system than needed from September 2015 – 1 in 3 schools will be a teacher short.
- Many primary trainee teachers receive less than 6 hours training for D&T.

Need for a modern D&T curriculum and workforce

- Insufficient use of 21st century digital technologies in some secondary schools reduces curriculum relevance for pupils and employers.
- Difficulties for secondary teachers to access Continuing Professional Development (CPD) to keep up-to-date with rapid changes in design and manufacturing processes and material technologies.
- Lack of primary D&T subject expertise, particularly in more technical aspects.
- Most primary teachers have received little or no D&T CPD in recent years.
- Often inadequate funding for resources, equipment and consumable materials in many schools.

Effect of school accountability measures and league tables

- Current Government policy acts against a broad and balanced curriculum to meet all pupils' needs, interests and aptitudes.
- Pupils in Academies or Free schools have no entitlement to D&T education – currently this includes 61% of secondary schools and 15% of primary schools.
- Primary schools judged on pupils' performance in English and mathematics, which take over 50% of teaching time – compared with 5% or less for D&T.
- Secondary schools are judged on pupils' GCSE grades in English Baccalaureate (EBacc) subjects (English, mathematics, history or geography, science and a language) – reduced incentive for subjects like D&T.
- No secondary school can be considered 'Outstanding' by Ofsted from September 2015 unless all pupils do well in EBacc subjects – a further disincentive for subjects like D&T.
- D&T increasingly marginalised, and in some schools being cut, with additional impacts on related areas of learning including: computing; coding; cooking and nutrition; health and well-being education.

Serious decline in GCSE numbers

- The loss of statutory status and current accountability measures have caused a 50% fall in D&T GCSE entries from 2003 to 2014 (D&T was a compulsory GCSE until 2004).
- Craft-related GCSE entries fell 25% from 2007 to 2013.

Latest estimates are that the UK will need:

1.82 million new engineers in the decade up to 2022 (Engineering UK, 2015)

1 million people to fill new creative jobs by 2030 (Nesta, 2015)

Every child is entitled to the unique contribution that D&T makes to their educational experience. If we are to preserve the subject, and our world lead, for the benefit of future generations of young people immediate and co-ordinated action is required by Government, employers in design and technology-related industries and the D&T community itself.

What must happen?

Government should:

- Make a creative and/or technical subject compulsory for all pupils at Key Stage 4.
- Address D&T teacher shortages through increased bursary incentives to attract the best entrants into secondary ITT and require all primary trainees to have sufficient D&T training.
- Ensure new D&T GCSE and GCE qualifications have credibility and status with universities.
- Promote wider understanding of D&T, its contribution to STEM and to career paths in engineering and the creative industries.
- Require Ofsted to acknowledge D&T's contribution to all young people's learning.

Awarding Organisations and Ofqual should:

- Develop GCSE and GCE qualifications that support modernisation of the subject and reward innovation, risk taking and entrepreneurship.

D&T-related employers should:

- Highlight D&T's value to Government departments through their companies, professional institutions and organisations.
- Collaborate with teachers in the development of real-life and relevant D&T activities and resources.
- Help teachers to provide opportunities for learners to engage with professional practice through study visits and work experience.

The D&T community should:

- Modernise and develop the curriculum to make it fit for the 21st century.
- Provide CPD that improves and extends teachers' subject knowledge – especially in digital and more technical aspects in both primary and secondary phases.
- Encourage collaboration across schools, colleges and universities to support progression of experience and learning – from Early Years to Postgraduate.
- Take every opportunity to publicise D&T, and related careers, to parents, school management, governors and employers.

The D&T Association will:

- Lobby Government to implement the required actions without delay.
- Work to increase understanding of D&T at policy level and encourage MPs to visit schools to see D&T in action.
- Support and advise Awarding Organisations in the development of new qualifications.
- Draw on design and manufacturing industries' expertise to ensure practice in schools supports employers' needs.
- Actively challenge and support schools to improve the quality of D&T on offer.
- Provide resources to support high quality D&T training, teaching and learning.



Lift here 



“Design and Technology is a phenomenally important subject. Logical, creative and practical, it’s the only opportunity students have to apply what they learn in Maths and Science – directly preparing them for a career in engineering. Policy-makers must recognise D&T’s significance and strive not just to preserve it, but to make sure it appeals to the brightest of young minds.”

Sir James Dyson, Founder and Chairman of Dyson and Patron to the D&T Association

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D&T education makes a unique and valuable contribution to the education and preparation for life for every child – at work or leisure. For some it can be the start-point for highly satisfying and successful careers in industries that bring increasing economic benefit to the UK.

What are the pressures?

The UK's emergence from economic difficulty is revealing significant areas of weakness, particularly relating to skills shortages. It comes as no surprise therefore, that many associations and organisations in engineering and the creative industries are engaged in campaigns to raise awareness about the shortfall in the availability of suitably qualified workers. Pressures on the school curriculum, alongside outdated perceptions of these areas of activity, are preventing young people from making subject choices that can lead to a wide range of engaging careers.

National context

Reducing creative and technical education threatens the UK's recovery from economic downturn. The consequences go beyond pure economics in terms of the well-being of individuals and society. Many of the shortfalls centre around skills shortages in engineering, manufacturing and the creative industries, which are predicted to grow strongly and contribute billions of pounds to the UK's economy. Estimates are that the UK will need:

- 1.82 million new engineers in the decade up to 2022 (Engineering UK, 2015)
- One million new creative jobs by 2030 (Nesta, 2015)

By contrast, the number of 18 year-olds available to progress into Further and Higher Education will decrease (by 8.9%) in the decade up to 2022 (Department for Business, Innovation & Skills, 2011). Additionally, employers consistently state that current curriculum and qualifications systems are not delivering the skill sets they look for in young people entering employment (Confederation of British Industry, 2015).

D&T: status and marginalisation

D&T is nearing a point where the decline in participation threatens its critical mass and thereby endangers its future. Growing evidence from secondary schools shows that D&T is often sidelined and, in some schools, is being cut from the curriculum altogether. In primary schools D&T has been on the margins for some years and the ever-increasing focus on English and mathematics leaves less time for other subject learning.

More than a third of secondary schools responded to a D&T Association survey in March this year. The following points emerged from the schools' responses:

- 89% agreed that Progress 8 and EBacc measures are influencing option choices and result in lower D&T GCSE numbers.
- 83% agreed that changes in curriculum time allocation and numbers taught are likely to reduce D&T staffing.
- 35% indicated that compared with last year, D&T curriculum time at Key Stage 3 (Years 7 to 9) will be reduced from September 2015.

Schools reported that D&T is consistently being undervalued by comparison with EBacc subjects. In the most extreme cases students are actively discouraged from opting for D&T, or prevented from doing so through the restricted curriculum choices on offer.



Many referred to more able students being persuaded not to choose D&T, in favour of additional EBacc subjects. Given these pressures, numbers will inevitably decline and the full ability range will not be represented across the GCSE entry.

Modernising the D&T curriculum

The pace of technological change over the past 26 years has brought many additional demands to the D&T curriculum, in terms of areas of learning to be included such as digital design and manufacture (CAD/CAM).

Purpose of Study

'Design and Technology is an inspiring, rigorous and practical subject. Using creativity and imagination, pupils design and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values. They acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art. Pupils learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, they develop a critical understanding of its impact on daily life and the wider world. High-quality design and technology education makes an essential contribution to the creativity, culture, wealth and well-being of the nation.'

National Curriculum in England: Design and Technology programmes of study, Department for Education, September 2013

During this same period a lack of funding for resources and restricted access to Continuing Professional Development for teachers has limited the continuing review and development required to ensure that the curriculum on offer remains up-to-date and serves both pupils' and employers' needs.

Initial Teacher Training (ITT)

Most newly qualified primary teachers start their careers with insufficient subject expertise to teach D&T well. In the secondary sector take-up by ITT applicants is the lowest of any subject, leading to a chronic shortage of qualified teachers. Bursaries provided to incentivise the study of shortage subjects are imbalanced (up to £25,000 for mathematics, physics, chemistry, computing and languages; up to just £12,000 for D&T).

Only 2 undergraduate ITT programmes remain in England. The majority of training is delivered through school-based routes, linked to universities with little knowledge of D&T education. Many schools report difficulty in filling teacher vacancies – increasing the likelihood of the subject being marginalised.

What does D&T offer?

Given its breadth and depth D&T has much to offer across a wide range of career paths in engineering, manufacturing and the creative industries. In addition to learning about designing and making processes, materials technology and programmable systems and control, D&T contributes to the development of important life skills and personal qualities such as team working, risk taking and enterprise.

All learning is best secured by the successful application of knowledge, skills and understanding in different contexts. The D&T curriculum provides many opportunities for literacy, numeracy, computing and scientific knowledge and understanding to be practically applied across all stages of education.



Design thinking

The rigorous process that underpins designing and making activity demands both creative speculation and logical decision making to arrive at valid, and better, solutions. The essential core of D&T lies within the balances between: creativity and control; and thought and action. These thinking and practical skills are invaluable to each and every individual.

Evaluation of products and services

Industry and consumerism are now integral parts of our culture and everyone needs to be equipped to play their part, be it through contribution or response. D&T helps pupils express preference and exercise influence on their spending decisions and in doing so challenge manufacturers' and suppliers' assumptions about the quality or suitability of products and services – especially important when safety or well-being are at stake.

Skills for life

Through engaging with designing and making activities in D&T young people develop a range of skills and personal qualities which will support them through life – and are valued by employers. These skills include independence, team working, resilience, resourcefulness, risk taking and entrepreneurship.

In summary

It is D&T that supports the development of a wide range of capabilities, within and beyond immediate subject content, which forms an essential part of education and preparation for life for all young people. For some this will be the start-point of graduate, technician or craft level careers in the creative, engineering and manufacturing sectors. But, D&T is for all and it must also be right that decision makers at a public level, including county councillors, politicians and company executives, have the skills, knowledge and understanding to take actions that best promote quality of life, protect security and preserve the environment.

We therefore owe it to all young people in education now, the generations to come, the well-being of society and the UK's future success to do whatever we can to retain and develop D&T education...while we can and before it's too late!



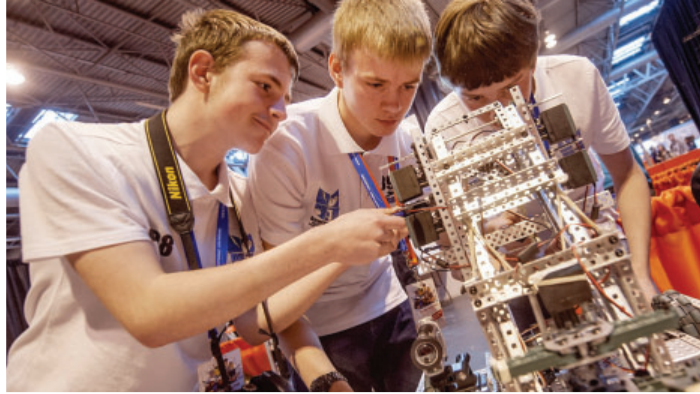
Technological understanding

Through modern and developing technologies we exert an ever-greater influence on our surroundings by making improvements to housing, transport, communications and the everyday objects we use, at work and in leisure. D&T helps to develop the knowledge, skills and understanding which makes this possible. It also prepares young people to meet the future challenges of sustainability, in the face of increasing world population, climate change and finite resources, and to continue the development and control of technological advances.



Act now! Get more information and support the campaign at: www.data.org.uk/campaign

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"Design and Technology is a key subject in drawing the next generation towards engineering. It makes a critical link between science and mathematics and provides real-world contexts in which these subjects can be applied through design. But D&T is not just about future engineers. By teaching D&T we are ensuring that all children are not passive bystanders in our increasingly technology driven world but are informed citizens who understand how design impacts on their quality of life and how technology can be used for the benefit of mankind."

Dr Rhys Morgan, Director of Education, Royal Academy of Engineering



"It is clear to me that D&T offers an unrivalled opportunity to inspire more young people towards a career in engineering and technology. Given the very significant projected talent shortfall in these areas it seems to me bewildering that we are steering students away from this hugely valuable subject."

Dr Paul Greening, Director, Centre for Engineering Education, UCL



"Science and maths alone cannot provide the creative thinking and hands-on expertise that is essential to producing world-class designers and engineers. An understanding of D&T ensures that students are equipped with the tools to thrive in an increasingly fast-paced, innovation-hungry marketplace."

John Mathers, Chief Executive, Design Council



"The fall in numbers in pupils studying D&T is a disaster. In all the talk about STEM we consistently underestimate the importance of D&T which is the perfect proving ground for craftsmanship, creativity and curiosity, which the CBI and others tell us are needed in the world of work."

Professor Bill Lucas, Director: Centre for Real-World Learning, University of Winchester



"Without a varied curriculum the UK risks losing out at a time when global businesses increasingly value design skills and valuable jobs are given to students whose curriculum included design and technology. Part of what has made the UK great is its history of design and innovation against all the odds. Let's not lose our edge by failing our young people."

Kim Colin, Co-Founder, Industrial Facility



"D&T can be the critical link between, on the one hand the evolving 21st century skill-sets required by manufacturers and on the other, a vibrant, re-balanced and export-led economy that must re-invest and up-skill to deliver increased innovation. Without enthused students with a foundation in D&T to become tomorrow's skilled engineers we will be missing the key ingredient to the delivery of the long-awaited industrial strategy."

Andrew Churchill, Managing Director, JJ Churchill Ltd.



"If the government really wants a resurgence of manufacturing in this country it should start with schools: D&T is the vital subject that instils a love and fascination of making products."

Mark Miodownik, Professor of Materials & Society and Director Institute of Making, University College London



"Britain is great at engineering and needs more engineers. I am always optimistic about the future for engineering when I see great design and technology project work produced by young people."

Paul Jackson, Chief Executive Officer, EngineeringUK



"For Britain's economy to grow, we need a highly skilled workforce, fluent in upcoming technology. To meet this challenge a solid foundation in engineering, science and design is needed to create a resourceful workforce who can quickly adapt and embrace future technologies. It's not tomorrow's workforce I'm concerned about, it's this afternoon's!"

Sam Lanyon, Designer & Technologist, Founder of Concept Shed Ltd.



"Thinking about my civil engineering career over the past 5 years, the A level choice that provided the most useful skill set was definitely design and technology – it taught me much more than just how to design and make things."

Claire Gott MBE, Associate, WSP | Parsons Brinckerhoff



"The Government's left hand sings the praises of the UK's Creative Industries while its right hand sweeps away the very education system which created it. The EBacc changes are decimating creative subjects (like D&T) which have, until now, fed a steady stream of talent into our world class creative industries."

Dick Powell, Founder, Seymourpowell Design



"D&T inspired me to train as a product designer. Creative thinking and problem solving are key skill sets for survival in the future knowledge economy. We need students trained in D&T to fuel this core British competency, which enables us to compete in the global marketplace."

Rob Law, Founder and Chief Executive, Magmatic Ltd. (makers of Trunki)



"The thought of D&T as a subject in danger worries and scares me. Without the passion and belief of my D&T teacher I would be a frustrated creative individual. I will do anything within my power to make sure that D&T gets appropriate recognition as an essential subject that teaches life skills and will shape the UK economy of tomorrow."

Max McMurdo, Designer, upcycler and TV presenter



"The current 'tech-savvy' generation will define and lead a dramatic change in the design and engineering community. So, how do we inspire this next generation of thinkers? We put the technology in their hands and show them the power of what's possible."

Carl Bass, President and CEO, Autodesk



"The UK motorsport industry is world-leading and depends on the outstanding design and technology talents that reside in Motorsport Valley UK. Good design is at the heart of that success and it would be a scandal if young people were not able to study D&T, which can demonstrate the excitement, thrill and enjoyment that so many have in engineering."

Chris Aylett, Chief Executive, Motorsport Industry Association



"The UK is experiencing an engineering and technology skills crisis. Our recent research with young people and their parents found that creativity and variety are the two features of an engineering and technology career that are most likely to appeal. Design and Technology is an important way of introducing these features at an early age, so should be protected in the school curriculum."

Nigel Fine, Chief Executive, Institution of Engineering and Technology



"It is my belief that all primary children should be entitled to learn D&T skills as a vital part of a broad, balanced curriculum. Children at our school love this area of the curriculum."

Anyone visiting The Wroxham School can see the impact of D&T teaching on the vibrant environment where enquiry and high ambition are at the heart."

Dame Alison Peacock, Executive Headteacher, The Wroxham School



"Design thinking allied to practical making skills not only makes D&T a vital and unique subject in its own right, but also one which can help contextualise maths, science and computing. D&T should be an essential component in the curriculum of all students."

David Anderson, Headteacher, Queen Elizabeth's Grammar School

In D&T children and young people:

- learn to design, make and control high-quality products and systems
- develop practical skills through the use of tools, materials and components
- look to the future by being creative and innovative
- use knowledge and understanding to solve problems in real-life contexts
- evaluate and test their own ideas and become informed consumers of products and services
- learn about sustainability issues concerning finite resources and energy production
- develop the competence to fully participate in an increasingly technological world
- develop the desire to be enterprising and a readiness to take risks
- enjoy, value and are motivated by designing and making.



"Design and technology is a vitally important and valuable subject. It equips young people with a firm grounding in knowledge and skills such as problem solving, which are in great demand in the labour market. ASCL is extremely concerned about the potential demise of this subject and is committed to working with the Government, employers and the D&T Association to reverse this."

Brian Lightman, General Secretary, Association of School and College Leaders



"With creativity being at long last acknowledged as one of the main drivers and wealth creators of the British economy, it is time that D&T was taken more seriously across the school curriculum. This is a subject that encourages young people to become designers, manufacturers, entrepreneurs and to satisfy their own ambitions, and those of the nation."

Wayne Hemingway, Designer



"Manufacturers are always on the look-out for young, fresh, talent. In particular they are seeking young people that have the right combination of academic qualifications and technical skills. Students taking practical subjects such as Design and Technology, which incorporates many key engineering principles, are attractive to manufacturing employers."

Verity O'Keefe, Senior Employment and Skills Policy Adviser, EEF – the manufacturers' organisation



"We need to ensure that the design and technology education young people are receiving is up-to-date, relevant and engaging – we need to take this opportunity to inspire creativity, build skills and develop the next generation of makers and innovators."

Pippa Morgan, Principal policy adviser – education, CBI



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The Design and Technology Association is the only professional organisation representing over 10,000 members and working on behalf of all those involved in D&T teaching and learning.

We believe passionately in the value of D&T education for all young people and will work tirelessly to ensure that our world lead, gained over the last 26 years, is not lost.

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