

We Believe in Design and Technology. What do you believe in?

The Design and Technology Association's 2011 manifesto for design and technology education

Design and Technology education is unique because students:

1. look to the future and are creative and innovative
2. design and make products and services, using a variety of materials, that work well and look good
3. make design decisions that matter to the users of the products and services and to the wider world
4. draw on a wide range of knowledge to solve problems in relevant, real life contexts
5. develop an enterprising attitude and take risks
6. see opportunities and make things happen.

Design and Technology can lead to careers as an:

- Engineer
- Food scientist
- Product designer
- Graphic designer
- Fashion designer/technical textiles
- Architect
- Interior designer
- Games designer
- Project manager
- Chef
- Plumber
- Designer/crafts people – eg jeweller, cabinet maker

"The teaching of quality design and technology in our schools is a vital requirement for the country's future in the 21st century."

Sir James Dyson

Why do we need a manifesto?

With the introduction of the National Curriculum in 1989 England and Wales were the first countries in the world to include Design and Technology as a statutory subject for all pupils from 5 to 16. With a history of just over 20 years a huge amount has been achieved and in both primary and secondary schools it is one of the subjects enjoyed most by pupils.

However D&T remains a young subject which needs continuing attention and support if it is to develop and mature. Throughout its short life D&T has experienced regular change to both curriculum and examinations. However, design has provided a constant core for the subject while content has changed to reflect new materials, processes and techniques.

These changes bring their own pressures – the need for teachers to update their knowledge and skills; the need to review curriculum content to ensure it is appropriate for a 21st century curriculum; and the need to ensure examinations provide opportunities for, and reward, genuine creative and innovative responses.

These changes are not slowing. In fact since the election of the coalition Government in May 2010 we know that the subject faces more challenges including:

- curriculum reviews in both primary and secondary education;

- a review of 14-19 vocational education;
- the introduction of academies, University Technical Colleges (UTCs) and free schools;
- changes to testing and examinations;
- changes in Initial Teacher Training;
- reduced funding for many schools;
- the loss of Government funded support agencies and Local Authority support networks.

Design and Technology can meet these challenges. As Ofsted says, "Design and technology has to be an essential part of every pupil's learning experience. The subject encourages creativity and contributes to the personal development of students of all ages,"

Education for a technologically advanced nation: Design and Technology in schools 2004/7; Ofsted, 2008.

But in order to meet these challenges the D&T subject community, collectively, has to:

- have a clear vision of what constitutes 21st century D&T;
- be able to make that vision a reality by developing and teaching a modern, motivating curriculum.

This manifesto starts that process. It sets out the D&T Association's views and identifies the issues that we believe have to be addressed. But most importantly it asks you to get involved to help ensure that the United Kingdom remains a world leader in design and technology education.

"I think Design and Technology is a very useful subject for the school curriculum. It develops the creative talents of students in a highly practical way. The UK leads the world in product design and needs a healthy supply of apprentices/students coming through to keep ahead of the game."

James Averdieck, founder of Gü Puds

"British designers are celebrated all over the world for their creativity and innovation but the real strength of our industry has, and always will, lie in education. I have always believed that intelligent design is of fundamental importance, not only to the economy but to the quality of everyday life for ordinary people. That's why it is extremely encouraging to see Design and Technology becoming an increasingly popular subject within schools and continuing to grow. It harnesses creativity at an important age and teaches practical, hands-on skills that will serve them very well in later life and play a key part in getting British industry making things again."

*Sir Terence Conran
probably the world's best known designer, restaurateur and retailer*

Primary D&T

Design and Technology is now an established element of the curriculum in primary schools. Although it was a 'new' subject when the National Curriculum was introduced in 1989, over the last 20 years it has gained a valued place in young children's learning. It is one of the most popular subjects with children and many teachers have come to see that it has tremendous power as a way of bringing learning to life for children.

Twenty years is no time at all for this sort of change. There has been relatively little money invested in the development of D&T and no national programme for development. So why this success?

- Practical work has a long-standing tradition in primary schools. Many teachers and parents recognise the importance of D&T in developing the broad spectrum of children's abilities.
- Many children who struggle with more formal methods of teaching excel in situations where they have to think for themselves and bring about practical solutions to real problems. This can be a huge boost to their confidence affecting their whole attitude to school learning.
- D&T provides a natural opportunity for children to put into practice and improve

basic skills in literacy and maths, a priority for teachers of young children.

- Primary D&T has attracted the support of an enthusiastic and dedicated group of teachers, advisers, consultants and teacher trainers who are passionate about the value of D&T for children and for the longer term future of our society and economy. This subject community has contributed to the development of materials which have had a big impact in schools, for example the QCA scheme of work and DATA Helpsheets.
- Where primary teachers have been given support to develop their own understanding of D&T, they have gone on to achieve impressive work with their children. According to Ofsted (Improving primary teachers' subject knowledge across the curriculum: A summary of evidence from subject surveys 2007-8 (excluding English and mathematics, Ofsted, 2009), D&T is in the top three primary school subjects for good and outstanding teaching.

Issues

- Quality learning in D&T requires adequate curriculum time and support so that children can explore, investigate, design, make and learn at a deep rather than superficial level.

- The quality of D&T in primary schools is inconsistent. Many children still do not have access to a high standard of education in this important element of a 21st Century curriculum.
- Many primary schools do their best in D&T with a limited budget for practical resources.
- The amount of time given to D&T in initial teacher education has been continually eroded over recent years. This has been coupled with a lack of opportunity for CPD and specialist advice for teachers at a local level. Good subject knowledge is an essential prerequisite for good teaching (The Annual Report of Her Majesty's Chief Inspector of Education, Children's Services and Skills 2008/09 Teaching and learning – measuring up against world-class education systems, Ofsted, 2009).

We believe that:

- all our children have a right to experience a broad, balanced curriculum in their primary school years which includes D&T as an essential component;
- designing and making is a powerful way of learning and it should be given the same status as other ways of learning in the primary school;
- through designing and making activities children develop vital life skills such as how to think through problems creatively, how to organise themselves and how to work with tools and materials. It equips them to bring about change and to shape

- the environment of the future;
- we have a responsibility as educators to help children understand the designed and made world in which we live. They need to be able to take action and to make informed decisions both as children now and as responsible members of society in the future;
- primary teachers should have access to quality-assured training and resources to teach this important subject effectively. For consumable items and up-to-date technologies we recommend at least £5.00 per pupil per year.

Secondary D&T

When you look at the secondary school's list of subjects not much has changed on the timetable in 100 years - w one major exception: Design and Technology.

Introduced by the Conservative government in 1989, this new subject has transformed teaching and learning in our schools. Ask pupils what they get excited about and they'll tell you about the projects that they are designing and making. It is no surprise that pupils do not truant from D&T and it is the most popular optional subject at GCSE with nearly 300,000 pupils studying it each year. Every year the Patent Office receives applications for patents to cover designs developed and manufactured by students studying D&T. Design and technology:

- seeks to develop a culture which credits

"Design and technology in schools is vital for the UK economy. It is a unique subject in which the learner must be analytical, evaluative, entrepreneurial, technical, scientific, artistic, physically fit, philosophical, emotionally intelligent, mathematical and reflective."

Ilsa Parry, winner of the BBC Design for Life competition in 2009 and founder of RETHINKTHINGS design consultancy

"If you make things you need to understand ideas, materials, markets, skills. ... And when you make things, you restore that essential practical and moral connection between effort and reward ... It does not matter whether you call it engineering, technology, design, craft or, possibly, even art. Whatever it is called, a system which gives priority to an engagement with products over a lust for quick returns is a more stable and wholesome one than a system where derivatives are a more reliable source of wealth than making a teapot. And it is, ultimately, a system more likely in the long run to make profits."

*Stephen Bayley,
founding Director of the Design Museum and design guru*

those who design and make products and show enterprise and ingenuity in their work;

- draws on knowledge and understanding from across the curriculum, but particularly maths and science, and requires pupils to apply this in practical ways;
- is the only subject where pupils undertake practical work in electronics, systems and control - providing awareness of vital engineering and electronics industries and careers;
- makes better and more effective use of ICT than any other subject, including the use of 3D CAD software, where we lead the world;
- provides unique opportunities to enable young people to analyse products and their impact on society and raises awareness and understanding of the technological issues which face citizens today when making decisions about issues ranging from nuclear power to biotechnology;
- gives pupils confidence to live, work and contribute in a technological world and

develops young people's sensitivity to human and environmental concerns, both locally and globally;

- offers opportunities for young people to develop as thinkers, planners, inventors and communicators – all essential to our future.

Issues

- In too many schools KS3 'rotational' courses make continuity and progression very difficult to achieve. The KS3 curriculum needs to be flexible enough to adapt to coming changes and to be able to prepare pupils to make informed option choices at 14+.
- The quality of D&T in secondary schools is inconsistent. In the best it is world-class, but in too many pupils do not receive a D&T education that is fit for the 21st century.
- Over 80% of entrants now enter D&T teaching via a one-year ITT route. This is insufficient time to ensure that all gain the breadth and depth of knowledge and skills required to set pupils aspirational standards in designing and making.

"Design and technology is about making things that work well. Creating these things is hugely exciting: it is an inventive fun activity."

Sir James Dyson

- Many secondary school D&T departments receive insufficient funding to ensure pupils receive a modern, engaging and relevant D&T experience.

We believe that:

- D&T should be an essential subject in the secondary curriculum of all pupils.;
- KS3 should prepare pupils to make informed choices about possible professional, technician [technical?] and craft D&T-related careers;
- where possible, schools should look to move away from rotational courses in KS3;
- the KS3 D&T curriculum should provide pupils with a flexible mix of activities including: mainly designing, mainly making, designing and making, and technology in society;
- new technologies, including electronics, systems and control and CAD/CAM, should be a key part of the KS3 curriculum;
- ITT should be the start of an ongoing programme of support and subject-specific CPD to which all D&T teachers have an entitlement;
- teachers need new project ideas, as well

as training, to keep them up-to-date with technological changes and so they can reflect the cutting edge and newest thinking in their teaching;

- there needs to be an increased recognition of the contribution of D&T in the STEM agenda, and that this should be matched by dedicated training for teachers with science and maths colleagues in order that the subjects may work more closely together;
- GCSE and A level examinations should encourage and reward creativity and innovation;
- there needs to be a better awareness and understanding of the value of all KS4 and post-16 examination courses involving D&T and the progression routes from them;
- schools should fund D&T to ensure all pupils have access to appropriate materials, tools and equipment to design and make high quality products. We recommend at least £12.50 per pupil per year.

"D&T education is an essential part of a school's curriculum, not just as preparation for a career, or further education in the creative industries, but for its wider educational benefits."

"The most important of these is the nurturing of creative thinking and process, and the eventual practical application of that skill. The ability to both conceptualise and analyse in a continuous loop of thinking is quite a rare skill which, when married to a knowledge and understanding of how to 'realise' provides children with an educational experience which is both different from, and complimentary to, more traditional academic subjects."

"At the same time of course, D&T education is the best possible start to a career in the UK's important creative industries."

*Dick Powell, co-founder of Seymourpowell,
one of the most successful design companies in the world*

Secondary workforce

D&T attracts teachers from a wide variety of backgrounds and experience, ranging from engineering, through fashion design to food technology. But they have one thing in common, which is the experience and inspiration to improve our quality of life and the designed world in which we live. They are practical, problem solving, creative, flexible and challenging individuals who pass on their skills, knowledge, values and inspiration through engaging their pupils in D&T activity.

D&T teachers help pupils to make sense of and give relevance to learning that takes place elsewhere in the curriculum, drawing on wider skills and knowledge and providing the opportunity to apply it first hand to solving real life problems.

Issues

- The predominate route into teaching D&T through a postgraduate certificate course, usually completed within nine months, provides very little opportunity to develop a wider range of subject knowledge to

enable teachers to support and develop pupils.

- The subject has an aging teaching population: 27% of teachers are over 50 years of age, are predominantly craft trained and on retirement will take with them the manufacturing knowledge that new entrants have yet to acquire.
- The number of teachers who have received training and feel confident to teach systems and control/electronics is so low that many pupils have limited opportunity to develop these skills. This impacts on the extent to which 'high-tech' can be built into products children design and make.
- Modern means of designing and manufacture using CAD/CAM technology is available in most schools but too few teachers have had significant training to enable its full potential to be achieved in school.
- The unrelenting development of the knowledge and skill base that underpins D&T activity is more rapid than that in any other subject area. As new technologies, processes and materials

"Our economy depends on innovation and the creation of unique ideas. However, too often in school, kids have to give the same 'right' answers in order to succeed. You have to think laterally and explore the question, 'What happens if...?' in order to innovate. Design and technology education is essential to encourage creative thinking and give young minds the confidence to go their own way."

Mandy Haberman, successful inventor and entrepreneur

"Design and Technology provides pupils with unique opportunities to learn and apply creative, practical and thinking skills to real, everyday problems. These are vital developmental experiences for everyone, supporting better choice making by individuals - as citizens, entrepreneurs and decision makers. Design and Technology adds positively to the liveability agenda. And let's not forget fun ... for many being creative is a great source of satisfaction, fulfilment and happiness."

*Wayne Hemingway,
founder of fashion label Red or Dead and now Hemingway Design*

"Design and technology is all-inclusive. It allows every child to succeed. It teaches children the importance of teamwork, co-operation, responsibility and commitment. It encourages them to think creatively and imaginatively. Through D&T, children gain a great sense of purpose and satisfaction as well as experiencing wonder at their ability to design and make."

Rebecca Higgins, D&T Co-ordinator

become available, teachers need CPD to ensure they remain up-to-date to be able to teach a curriculum that reflects the needs of industry and society today.

- As pupils make more use of industrial quality technology when designing and making, increased demands are put on the teacher. Design and technology is predominantly practical and, in a similar way to science, requires specialist support with qualified technicians and HLTAs working alongside teachers.

We believe that:

The D&T education workforce should:

- have a right to 4 days every year of high-quality, subject specific CPD to ensure they can provide a modern and relevant experience for pupils;
- have access to a quality-assured programme of CPD that builds on ITT;
- be able to access local and regional support centres that are involved with cutting-edge curriculum development involving new technologies;
- be part of local and national professional networks provided through the Design and Technology Association;
- participate in curriculum consultations and surveys designed to inform the development and implementation of D&T;
- contribute to the development of curriculum materials and their exchange;
- in every school, include suitably qualified and experienced technicians and HLTAs to support practical specialist activity.

Research

The D&T Association has a strong working relationship with universities engaged with research into design and technology education and a strong and long lasting commitment to identifying and developing the research base on which the subject must be founded.

This includes:

- the Association's online publication, Design and Technology Education: An International Journal, which is accessed by teachers and scholars across the world;
- the Association's website, which provides resources to support beginning researchers and enables them to share their work;
- the Annual Survey of Provision, which is used to collect a wide range of data regarding the use and application of resources, CPD needs etc, essential for those wishing to compare their own provision;
- the online research hub www.dater.org.uk, which brings together a fully searchable collection of over 1500 research papers dating back to the 1960s and is used extensively by experienced and beginning teachers alike;
- the Annual International Research conference, which provides a platform to disseminate research and develop both the UK and international research agenda.

"Success in D&T enhances children's self-esteem, promotes risk-taking and develops positive attitudes to all aspects of school life."

Ian Nurser, Headteacher

Issues

To ensure that the D&T Association is able to identify and address key issues from an informed position it is important to develop a research agenda that:

- informs curriculum development, pedagogy and the generation of resources;
- increases the overall understanding of D&T teaching and learning issues;
- involves and supports teacher practitioners in undertaking action based research.

We believe in:

- supporting and encouraging practitioner led action research;
- maintaining and publishing a research agenda, highlighting areas needing development and informing the research community;
- ensuring, through research, that the curriculum is informed by the needs of learners, society and employers;
- developing pedagogy appropriate to the needs of a 21st century curriculum and conducting research to establish the most effective methods of teaching and learning;
- providing open access to D&T research through the Association's research hub;
- developing the international dimension and increasing the awareness of developments in design and technological activity abroad;
- disseminating the outcomes of research

to a wide community extending beyond the D&T teaching profession.

What do you believe in?

This manifesto is the starting point of a campaign which aims to:

- develop and articulate a clear vision for D&T as it faces the challenges posed by changes to the education system;
- inform and engage teachers, senior leaders, governors, parents, government, government agencies and business and industry in a professional dialogue about the role of D&T education in a 21st century curriculum.

To do this we need your involvement. The more members of the D&T community who get involved the more powerful the message will be – so encourage your colleagues and friends to take part as well!

The issues and the priorities are likely to change over the coming months as the proposed curriculum reviews take place and report back so please visit www.data.org.uk/manifesto to

- tell us that you agree or disagree with what we believe in;
- find out the latest information;
- see suggestions on ways you can get involved now, next week and next year;
- contribute your views.

'It puts a smile on your face when you design and make something of your own!'

Becky, age 10

"For some reason Britons look down their noses at people who make things. They push intelligent people into the professions and into the media. Making things, however, should be an intelligent activity."

Sir James Dyson

"Design and technology is about making things that work well. Creating these things is hugely exciting: it is an inventive fun activity."

Sir James Dyson

Who we are

The Design and Technology Association is the recognised professional organisation representing all those involved in D&T education and its associated subject areas. The Association is governed by a Council of Management, elected by the members. With a commitment to inspiring, developing and supporting excellence in design and technology education for all, the Association aims to achieve this by:

- developing a curriculum which engages young people in designing and making in order to create quality products and prepare them for citizenship in a technological society;
- engaging young people in investigating and evaluating products and their applications and through looking at the associated values;
- enhancing the quality of teaching and learning in D&T;
- developing positive links with other curriculum areas, especially science, mathematics and art and design;
- working with industry and commerce to ensure that the benefits of such experiences permeate the curriculum at all levels;
- influencing society around us and bringing increased recognition of those involved in designing and making.

The Design and Technology (D&T) Association is an educational charity and a

company limited by guarantee. The Association is financed through membership fees, support from charitable foundations, industrial sponsorships and income generated through project management, publications, courses, conferences and consultancy.

