

Report summary

Meeting technological challenges?

Design and technology in schools 2007–10

Executive summary

This report draws upon evidence from design and technology (D&T) subject survey visits by Her Majesty's Inspectors (HMI) to primary and secondary schools between September 2007 and July 2010. The inspections evaluated how well the subject was meeting its National Curriculum aims and promoting high levels of achievement. Part A of the report focuses on the achievement of pupils, the quality of D&T provision and how effectively the subject was managed in the schools visited. Part B focuses on key challenges in D&T, most notably how schools can keep pace with rapid technological change and address issues of gender stereotyping in preparing pupils for the future.

Inspectors found that a considerable challenge facing schools is the modernisation of the D&T curriculum so that it keeps pace with technological developments, enabling pupils to learn about innovative new materials and to investigate practically how and why they work. Tackling this issue, particularly in secondary schools, is fundamental to the improvements that need to be made and essential if pupils are to become confident and capable members of a technologically advanced society.

Inspectors found excellent examples in primary and secondary schools and in sixth forms of pupils developing original ideas to solve real problems for people in their communities and further afield. In outstanding secondary schools, students learnt how modern materials and new technologies worked and how to design and make with them. In so doing, pupils developed the skills to think, design and shape their future. They had a secure understanding of how technology was changing the society they lived in and how scientific and technological developments currently taking place might bring about further change. Not all students in all of the schools visited experienced D&T of this high calibre. Many teachers were not keeping pace with technological developments or expanding upon their initial training sufficiently to enable them to teach the technically demanding aspects of the curriculum. The variation between the best and weakest provision was unacceptably wide.

Pupils' achievement in D&T was good or outstanding in 54 of the 89 primary schools visited, and in none of them was it less than satisfactory. Children mostly got off to a

good start in the Early Years Foundation Stage, where a well-planned range of purposeful activities supported their early development of practical skills. Good teaching, observed in more than two thirds of the primary schools, was characterised by careful planning and challenging practical tasks. Information and communication technology (ICT) was used well in D&T in just under half of the 67 schools where the quality was evaluated. The quality of teaching and assessment and their impact on pupils' achievement were better overall than in those schools visited for the last three-yearly report. Nevertheless, assessment remained weaker than other aspects of teaching. Inspectors' visits in the final two years of the survey took place against a backdrop of discussion nationally about the primary curriculum. This was reflected positively in the schools visited through good enrichment activities, and in purposeful designing and making in response to real needs.

The needs of all pupils in D&T were met well in the highest performing primary and secondary schools. Pupils with special educational needs and/or learning disabilities and lower-attaining students made good progress as a result of the good individual support they received. Most pupils in all of the schools visited enjoyed designing and making products, solving problems and seeing their ideas taking shape.

Pupils' work in D&T from their primary schools was rarely built upon by the secondary schools in the sample. Teachers planned the curriculum without reference to what had gone before. This lack of continuity led, in the less effective schools, to weak curriculum planning at Key Stage 3. Pupils said they found projects and units of work in D&T easy and the nature of the work was pitched too low or duplicated earlier learning of the type commonly seen in primary schools. This did not challenge pupils sufficiently, particularly the most able.

Achievement in D&T was more variable in the secondary schools visited than in the primary schools. It was good or outstanding in just under half of the 89 secondary schools visited; in nine schools achievement was outstanding, but in another four it was inadequate. In Key Stage 4, attainment at GCSE was markedly different for male and female students, as was their choice of D&T options. As in primary schools, secondary teachers used a wide range of strategies to involve students in lessons and enable them to take responsibility for their learning. More outstanding teaching was seen in secondary schools, where lessons included up-to-date technologies which were demonstrated and explained accurately to pupils. However, most of the schools visited had not made sufficient use of subject-specific training to enable teachers new to the profession, and those who were more experienced, to continually update their subject knowledge. This often resulted in an out-dated Key Stage 3 curriculum, an issue which also related to the upper end of Key Stage 2. In around a third of the secondary schools, too little use was made of electronics, computer aided design and manufacture (CAD and CAM) and control technology in the teaching of D&T. Consequently, the take-up of GCSE courses in electronics and in systems and control was low, reflecting the national picture.

To enable education in England to keep pace with global technological change, new approaches are needed to teaching pupils how to apply electronics in combination with new materials and how to apply control systems in all aspects of the subject,

including food technology. The responsibility for tackling the challenge of ensuring that the D&T curriculum keeps up with technological developments is primarily that of schools. However, the review of the National Curriculum, announced by the Secretary of State for Education on 20 January 2011, provides an opportunity to guide schools and to encourage their re-evaluation of how they are enabling pupils to learn about innovation and to investigate practically how and why modern materials work.

Key findings

- Most pupils in the primary and secondary schools visited enjoyed designing and making products and gained much satisfaction in acquiring technical skills and in seeing their ideas take shape. They were well motivated by the active learning strategies and practical problem-solving aspects of the subject.
- Achievement in D&T was good or outstanding in just over three fifths of the primary schools and just under half of the secondary schools visited. In these schools, the teaching was challenging, tasks were interesting and relevant and pupils benefited from the use of up-to-date ICT and other technology.
- Achievement that was no better than satisfactory was the result of weaknesses in teachers' planning and assessment, and work that was pitched too low, lacked relevance or duplicated earlier learning. Secondary schools rarely built upon pupils' experience of D&T in their primary schools.
- In just over a quarter of the primary schools and about a half of the secondary schools visited there were insufficient opportunities for pupils to develop knowledge of electronics, systems and control, and computer aided design and manufacture (CAD/CAM). This is a key weakness at a time of rapid technological advance.
- Take-up of GCSE courses in the essential technological areas of electronics and systems and control has been low, due mainly to the lack of relevant expertise among teachers. Dated approaches to work on resistant materials and textiles frequently reinforced stereotypical gender choices of courses in Key Stage 4.
- Good and outstanding teaching encouraged pupils to be innovative and creative, and enabled them to draw effectively upon their technological understanding and skills to produce ideas and manufacture prototypes. However, the quality of teaching about design in secondary schools generally did not enable pupils to evaluate critically and question what they see around them in order to challenge stereotypical and poor design.
- Good or outstanding curriculum provision across the age range was enhanced by the use of visits and visitors to support teaching and learning. In the secondary schools seen, good provision was also characterised by effective collaborative planning within departments and constructive partnerships with industry and with other providers.
- Schools generally had not made sufficient use of subject-specific training to enable teachers to continually refresh and develop their practice to teach the

technologically challenging and more modern parts of the curriculum and to stay up to date with developments in research and innovation.

- Primary and secondary school subject leaders were often unaware of how to find out what D&T training was available to them. Governors and school leaders lacked nationally available information and guidance on how to keep up to date with modern resources and materials for D&T.
- Health and safety were taught well in the primary and secondary schools visited. Staff were vigilant and pupils demonstrated good attitudes in following health, safety and hygiene rules.

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