

Developing design and technology in primary schools in England

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1 Setting the context

In 1989, there was a major reform of educational policy in England, which included the compulsory implementation of a National Curriculum into all state schools.

English, mathematics and science, the core subjects, were introduced first, followed in 1990 by design and technology. Indeed, England was the first country in the world to include design and technology education in a primary National Curriculum. During the following ten years, design and technology education has become firmly established in the English primary curriculum; the profile of primary technology education world-wide has been raised; and the subject introduced and integrated into a growing number of international primary curricula.

As design and technology was a new subject, there was considerable confusion initially as to its nature. There had been little in the way of teacher training, teacher Inservice courses or published materials which gave a clear rationale for the subject and its content. Despite the lack of preparation for the introduction of the subject, there is much evidence to support the notion that good practice exists in majority of primary schools; however there are areas which certainly need to be developed if standards in design and technology are to continue to rise in all primary schools.

2 Factors contributing to good practice

2.1 A national framework

The introduction of a national policy, a national curriculum document and a national scheme of work have provided a foundation for a common understanding and approach to the development of the subject.

2.1.1 A National Curriculum-policy and document

Any change at a national level is brought about, in part, by Government policy. In England, the introduction of a National Curriculum as a mandate meant that there was a minimum curriculum entitlement for all children. Not everyone would agree that such legislation is helpful and that change brought about in such a way does not win the hearts and minds of many teachers (Fullan 1989) but it is one way of trying to ensure that all children have access to a broad

and balanced curriculum. There are few other countries in the world where such a mandate exists and it appears that in those countries where there is no national co-ordinated approach to the introduction of the subject, the rate of change is very slow and inconsistent.

The current document (DfE 1995) has proved to be the most successful. The language is clear, the content manageable, and the structure provides appropriate guidance in order that schools can create their own schemes of work from it. It allows flexibility so that schools can focus on areas, which they feel best, meets the needs of their children, while providing a balanced experience over the primary age phase. The recent publication of the new curriculum for 2000 contains few revisions and this should ensure that schools will be able to concentrate on building on their current practice to continue to raise standards

2.1.2 A national scheme of work

The scheme of work for design and technology at Key Stage 1 and 2 (QCA 1998b) is a national exemplar scheme which breaks down the National Curriculum into Units of Work and indicates how a broad and balanced curriculum can be created throughout a primary school. There are a number of reasons why this should contribute to the raising of standards. Whilst there is still flexibility, it does ensure that all children are covering a similar curriculum; this scheme of work certainly has reduced the time needed for planning; and it provides an example of good practice against which schools can match and modify their own schemes.

2.1.3 The nature of the subject

Even as the subject was being introduced into primary schools there was ongoing debate about the nature of the subject. Whilst the content was set in the National Curriculum, one of the key issues was the 'process' versus 'product' debate. The notion that the end product was of little importance was given credence by some. It was argued that the process through which the children worked was all important and that the teaching of practical skills and the production of a quality product were relatively unimportant. Others held opposing views, arguing that a quality finished product should be the most important aim. As a consensus emerged, practitioners were able to focus on an agreed way forward, which did include teaching of appropriate skills, knowledge and understanding together with opportunities to use and apply them. This debate may have led, in part, to the slower development of children's design skills as it is easier to concentrate on making skills, which are more easily identified.

2.2 Practice in school

Of course, a quality national framework does not ensure that there is quality practice in schools as a number of factors contribute to success.

2.2.1 A supportive headteacher

For any successful curriculum change to occur, there is much research (Benson 1998, Harland and Kinder 1997) to show what an important part the headteacher plays. If the headteacher shows that he/she values the subject and wants to ensure that all the children have a quality experience, it will have an effect on both staff and children's attitude to the subject.

2.2.2 A proactive co-ordinator

A co-ordinator has the responsibility to ensure that the whole staff are made aware of the scheme of work and how its implementation will be monitored and evaluated. By involving all staff in discussions and decisions, a whole school approach to the subject begins to emerge and this is crucial if quality outcomes are to be achieved. The co-ordinator needs to be able to motivate, to be approachable and to inspire confidence. Indeed, Mike Ive (1999) stresses the importance of such a person in school to lead the development of the subject.

2.2.3 Sufficient resources

There has always been much debate about the cost of introducing the subject into the primary curriculum and the Design and Technology Association's annual surveys (DATA 1996a, 1997, 1998) have provided much useful information. In the 1997/8 survey in the teachers' judgement levels of funding have continued to rise, with more than 50% of schools reporting adequate or better resourcing. This is certainly a positive finding but there is no room for complacency as 48% still feel that learning is restricted because of the level of funding. Many schools are creative in the ways in which they gain resources and utilise links with people connected to the school and local companies to acquire a wide variety of materials and tools.

2.2.4 Teaching and learning

Whilst documentation is important, appropriate teaching and learning methods are critical if the subject is to flourish. Teachers use a variety of teaching and learning strategies to meet the needs of individual children and differing curriculum areas. The introduction of three types of activity for the delivery of design and technology has certainly aided the quality of teaching and learning in the classroom. Investigative, disassembly and evaluative activity (IDEA), focused practical task (FPT) and a design and make assignment (DMA) have provided a framework for the delivery of each unit of work and this has helped teachers to understand that there is a need for some direct teaching of skills and knowledge which can then be applied, when the children carry out an open ended assignment. Evidence of the raising of standards in teaching and learning is found in recent Office for Standards in Education (OFSTED) reports though there are still more concerns at Key Stage 2 than Key Stage 1 (Ive 1999).

2.3 Support for the implementation of design and technology

Whilst support was initially slow, there have been some initiatives which have had a marked effect in helping to raise standards.

2.3.1 *Developing teachers' confidence and understanding of the subject*

Teachers' confidence has been raised through two main routes. Firstly, there has been the opportunity to take part in Inservice courses; and secondly the subject has been introduced to Initial Teacher Training courses. Inservice courses have varied in quality, length and geographical distribution. Where courses have been successful there is evidence to show that these have had a positive impact both on individuals and on schools. However, in order for Inservice to be more effective, it should be available across the country and monitored to ensure that standards are maintained.

Over the last ten years there has been no structured national programme for design and technology in Initial Teacher Education. Generalists students' entitlement has varied from 5 hours to 25 hours and more over their course (Benson 1997, Till 1999) whilst specialist students have had an equally varied provision. It has therefore been hard to maintain standards and to ensure that all those leaving teacher training courses are equipped to teach the subject in the primary school.

More recently there have been a number of initiatives which should continue to increase teachers' confidence and understanding. The Teacher Training Agency (TTA) has identified design and technology as an area in need of inservice support and providers were allowed to bid for substantial courses. The Department for Education and Employment (DfEE) has determined that all those who want to teach design and technology and other foundation subjects unsupported in the classroom need to have achieved a certain level before leaving their place of training (DfEE 1998). DATA has identified a set of standards (DATA 1996b) which indicate in detail what all generalist and specialist students should be able to do. They have to show that they have capability not only in the subject but in their ability to implement it in school.

2.3.2 *A National Association*

The importance of having a strong national association that can encourage, offer support and, if necessary, fight for the subject area is evident. DATA has been active at all levels during the last ten years. It has constantly given a steer to the development of the subject at Government, Higher Education, Local Education Authority, school and individual teacher levels. It has maintained a national profile through for example its Journal, its National Conference, its primary publications and its lively primary advisory group. It has brought together groups with differing viewpoints and has helped to provide a coherent and cohesive national support structure.

2.3.3 *Information sharing*

Schools need to have on-going support to help them to maintain and develop design and technology. There are so many new initiatives and literature with which schools are bombarded that it is not an easy task to decide what is, and is not, useful. It would be valuable to have a good national 'filter system' which highlights any kind of support which may be useful to schools. DATA, for example, produces a newsletter and is trying to provide a range of useful information on its website (www.data.org.uk) including news of the latest documents and case studies of work in schools. Other useful websites include QCA (www.open.gov.uk/qca/), Nuffield ([www.nuffieldfoundation.org / primaryDandT](http://www.nuffieldfoundation.org/primaryDandT)) and CRIPT ([www.uce.ac.uk. then education.research.cript](http://www.uce.ac.uk/theneducation.research.cript)) which offer support for all those involved in design and technology education.

2.3.4 *Research*

As design and technology was a new subject a decade ago, there has been little research on which to draw. Gradually there have been opportunities to address this problem and dissemination of research has been possible through a number of avenues. Proceedings from conferences such as The International Design and Technology Educational Research Conference (IDATER) and the First Primary Design and Technology Conference (1997) and journals such as the DATA Journal and the International Journal for Design and Technology provide a forum through which to disseminate valuable research information.

3 **Future developments**

Whilst in England we have moved a long way in the development and implementation of the subject, there is no room for complacency and there remains much to be done.

3.1 It is essential that there is a period of stability in terms of documentation and national initiatives; this is certainly different to a period of inaction. If we are to move forward and build on best practice, the 'big picture' must stay the same. Schools can then concentrate on evaluating and changing their practice, without constantly changing the long term frameworks.

3.2 There is still a need for sustained, quality Inservice work to support co-ordinators and classroom teachers.

3.3 The structure of different types of activities has helped teachers to structure their work but it has sometimes led to the fragmentation of the whole design and make process. As teachers become more confident, the structure should be less rigid so that both teachers and children see the process as a whole.

3.4 Areas for specific development such as designing, including evaluating, the specific use of technical vocabulary and the development of children's knowledge and understanding need to be highlighted and specific strategies used to ensure standards are raised.

3.5 The development of the use of IT within design and technology needs to be extended and support given to help schools to move forward.

3.6 The development of cross curricular links needs to be addressed in a more organised way. Links with language, mathematics, science, IT and art need to be clearly identified both in teachers' planning and with the children.

3.7 With the rapid developments in technology, the possibilities for sharing good practice world-wide through, for example, e mail, video conferencing and the Internet will increase and cost less. Children are already excited by design and technology. Watching others in different countries taking part in projects will only increase their interest.

3.8 Useful areas of research need to be identified and focused on. Joint initiatives with colleagues both in this country and overseas can only enhance our understanding of design and technology and its development. Such work enables all of us to reflect on and evaluate our own practice.

Once the new curriculum for the year 2000 is in place, there is a need in England to ensure that there is continuing world-wide discussion and debate relating to the evaluation and evolution of the curriculum in order that the subject develops appropriately for the new millennium.

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