The subject leader's handbook

Coordinating design and technology across the primary school

Alan Cross

THE PRIMARY SUBJECT MANAGER'S HANDBOOKS SERIES

Coordinating design and technology across the primary school

THE SUBJECT LEADER'S HANDBOOKS

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Figure 6.1, page 88: The author and Publisher would like to thank David Fulton Publishers for permission to reproduce Figure 2.2 from Harlen, W. *The Teaching of Science* (first edition).

Series editor's preface

This book has been prepared for primary teachers charged with the responsibility of acting as design and technology coordinators (d&t) within their schools. It forms part of a series of new publications that set out to advise such teachers on the complex issues of improving teaching and learning through managing each element of the primary school curriculum.

Why is there a need for such a series? Most authorities recognise, after all, that the quality of the primary children's work and learning depends upon the skills of their class teacher, not in the structure of management systems, policy documents or the titles and job description of staff. Many today recognise that school improvement equates directly to the improvement of teaching so surely all tasks, other than imparting subject knowledge, are merely a distraction for the committed primary teacher.

Nothing should take teachers away from their most important role, that is, serving the best interests of the class of children in their care and this book and the others in the series do not wish to diminish that mission. However, the increasing complexity of the primary curriculum and society's expanding expectations make it very difficult for the class teacher to keep up to date with every development. Within traditional subject areas there has been an explosion of knowledge and new fields introduced such as science, technology, design, problem solving and health education, not to mention the uses of computers. These are now considered entitlements for primary children. Furthermore, we now expect all children to succeed at these studies, not just the fortunate few. All this has overwhelmed a class teacher system largely unchanged since the inception of primary schools.

Primary class teachers cannot possibly be experts in every aspect of the curriculum they are required to teach. To whom can they turn for help? It is unrealistic to assume that such support will be available from the headteacher whose responsibilities have grown ever wider since the 1988 Educational Reform Act. Constraints, including additional staff costs, and the loss of benefits from the strength and security of the class teacher system, militate against wholesale adoption of specialist or semi-specialist teaching. Help therefore has to come from exploiting the talents of teachers themselves, in a process of mutual support. Hence primary schools have chosen many and varied systems of consultancy or subject coordination which best suit the needs of their children and the current expertise of the staff.

In fact, curriculum leadership functions in primary schools have increasingly been shared with class teachers through the policy of curriculum coordination for the past twenty years, especially to improve the consistency of work in language and mathematics. Since then each school has developed their own system and the series recognises that the one each reader is part of will be a compromise between the ideal and the possible. Campbell and Neill (1994) show that by 1991 nearly nine out of every ten

primary class teachers has such responsibility and the average number of subjects each was between 1.5 and 2.2 (depending on the size of school).

These are the people for whom this series sets out to help to do this part of their work. The books each deal with specific issues whilst at the same time providing an overview of general themes in the management of the subject curriculum. The term *subject leader* is used in an inclusive sense and combines the two major roles that such teachers play when they have responsibility for subjects and aspects of the primary curriculum.

The books each deal with:

- coordination—a role which emphasises: harmonising, bringing together, making links, establishing routines and common practice; and
- subject leadership—a role which emphasises: providing information, offering expertise and direction, guiding the development of the subject, and raising standards.

The purpose of the series is to give practical guidance and support to teachers, in particular what to do and how to do it. They each offer help on the production, development and review of policies and schemes of work; the organisation of resources, and developing strategies for improving the management of the subject curriculum.

Each book in the series contains material that subject managers will welcome and find useful in developing their subject expertise and in tackling problems of enthusing and motivating staff.

Each book has five parts:

1. The review and development of the different roles coordinators are asked to play.
2. Updating subject knowledge and subject pedagogical knowledge.
3. Developing and maintaining policies and schemes of work.
4. Monitoring work within the school to enhance the continuity of teaching and progression in pupils' learning.
5. Resources and contacts.

Although written primarily for teachers who are d&t coordinators, Alan Cross's book offers practical guidance and many ideas for anyone in the school who has a responsibility for the design and technology curriculum including teachers with an overall role in coordinating the whole or key stage curriculum and the deputy head and the headteacher.

In making the book easily readable, Alan has drawn upon his considerable experience as a teacher educator, researcher and OFSTED inspector with responsibility for d&t. Alan's own enthusiasm for the subject spills out into the book and makes it an enjoyable read. He has written extensively on the subject previously and his advice will be invaluable for those attempting to develop a whole-school view of progress in d&t, particularly those who are new to the job or have recently changed schools. It will help readers develop both the subject expertise they will need and the managerial perspective necessary to enthuse others.

Mike Harrison, Series Editor
January 1998

Introduction

Opening remarks

Primary classteachers require leadership and support to teach design and technology as part of the primary curriculum. Primary schools require leadership in design and technology education to ensure coverage, balance, continuity and progression for all children. In the primary context design and technology is taught as part of a broad curriculum of nine subjects, often but not always as part of an integrated topic or theme. The response of most primary schools to the challenge of teaching a broad and balanced curriculum is to plan thoroughly and to delegate responsibility for the management of subjects and aspects. This book articulates and details the role of the coordinator for design and technology. It includes advice about priorities and actions and considers the development that you might encourage as a design and technology coordinator. This is done in such a way as to make it possible for students, teachers (including those newly qualified and others new to the subject] to develop professionally as they establish the needs of the school and to begin to address them. Evaluation will be stressed as part of the role and as a contribution to schools' systems for monitoring and evaluating aspects of the curriculum. Perhaps the biggest challenge for subject coordinators, particularly those who have recently trained, is to develop and maintain a whole-school view while maintaining a focus on individual development by children.

The word coordinator is misleading, the word manager may be more accurate. The role varies from school to school, it is hard to imagine the headteacher managing all of the subjects, so who better to manage a subject in a primary school than a teacher in that school? It has been suggested that subjects like design and technology as part of primary education might benefit from subject experts teaching specialised lessons (Alexander et al., 1992). Subject expertise in design and technology within primary education is in short supply. We should consider the advantages of a committed primary professional, who, with support from the headteacher, can achieve much. As design and technology expertise is so scarce, primary schools may need to consider specific actions to increase experience in this area. This must focus on the coordinator, it should include the other adults working with children. Support for design and technology as part of primary education should be manifested in a number of the following ways:

- leadership from the head/senior management team;
- a place for the subject in the school development plan;
- clarity about the role of coordinator of design and technology and its relation to others in school;
- regular review of your role as coordinator;
- an annual budget sufficient for the subject;
- attention to your professional and subject INSET needs as coordinator;
- attention to the professional and subject INSET needs of the staff; and

■ regular, planned, release time for you as coordinator.

Having seen that expertise in design and technology is limited in primary schools, it is important that we should make the most of what we have and build upon that actively. That is what designers and technologists (cooks, engineers, farmers, architects) do and it is certainly what we in primary education are used to!

Design and technology is a subject which is a statutory entitlement of all pupils in the United Kingdom (UK) from 5–14 years and part of the 'natural' entitlement of all pupils preparing to participate as adults in society (Eggleston, 1992). Whichever society you belong to in the twenty-first century, individuals are likely to need to be able to deploy skills and use knowledge from design and technology. Citizens will have to weigh up pros and cons in issues related to the environment and to products and services they use as consumers. They need to appreciate that science and technology often offer solutions to human problems, but that for each advantage offered there are usually corresponding disadvantages. Air travel is an example of a technology which offers much, including rapid transport of people and goods, but the disadvantages of air travel include use of land for airfields, pollution, noise and even air warfare. Science and technology almost always deliver more than the things they promise.

Primary schools are complex places. It may be relatively straightforward for a teacher to make significant changes in one classroom but those changes may never affect other classrooms. This book advocates a whole-school approach. Indeed this is the very reason that subject coordinators are identified, in order to ensure that there is a consistent, whole-school view of and approach to the subject.

This book is about management of design and technology education in primary schools and those who do that managing. It will refer to children, to their teachers and classrooms. Children are the reason for this book and their entitlement to and achievement in design and technology as part of their primary education should be the focus of the design and technology coordinator. The single aim of design and technology coordinators, and therefore the aim of this book, is raising children's attainment in design and technology and across the curriculum.

All subject coordinators should beware of being dominated by the need to provide paperwork and should constantly find opportunities to see children's design and technology work and be actively involved over a period of time in teaching and observing a wide range of children and their work.

Human beings and technology

All societies have, and in the past have had, technology. The ancient civilisations, like the Inca or the Egyptians, developed their own technology of building, clothing technology, metalwork technology, food technology, and in the case of the Egyptians, even a technology for enbalming the remains of their dead. Similar technologies are seen throughout history around the world and in the present day. All human beings have needs and aspirations, including the need for clothing, food, security, warmth, to name a few, and aspirations which include a sense of place, of self-worth, a need to express oneself. Many of these needs and aspirations are achieved through a technology. The technology

of paintwork allows us to protect structures from the weather and to express complex inner feelings about humanity. These examples are as much part of the world of a six year old as an adult, as much a part of the life of a householder, teacher, plumber, artist or engineer. It is the engagement with, and response to, the 'need' and the person's ingenuity, creativity, knowledge of materials, tools and techniques that allows solutions to be found. One way to examine an individual technology is to list those things which distinguish it from other technologies. That is, all technologies have their own set of **tools:** i.e. the tools of painting technology are different from those in food technology. In the same way, each technology has its own **language, workplace techniques** and **practices.** Their commonality is the human being using them to solve problems.

Because so much technology derives from simple human needs for shelter, clothing, food and other basics, children are well placed to participate fully in design and technology as part of their education. All children have recent experience of dealing with and learning about these needs (see Figure 1.1—Making a house a home). As different people will often design and make different but quite acceptable solutions to a need there is much scope in design and technology for personal expression, building confidence and self-esteem. Thus design and technology as an educational experience has much to offer,

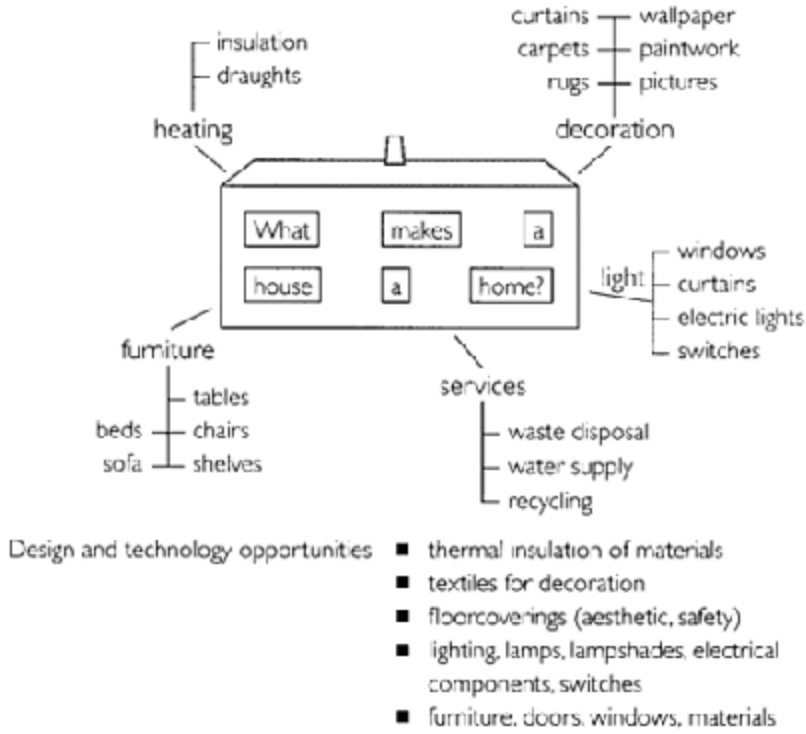

FIG 1.1

Example of a theme—what makes a house a home?

firstly in its own right as a subject but also for its spin offs into other subjects and the potential it has for personal growth. It may assist you to consider examples of design and technology in your life. Think about any simple designing and making you may have been involved in whilst:

- laying out a garden;
- reorganising a kitchen;
- decorating a house;
- developing an area in school;
- preparing a sports field or equipment; or
- setting up a TV, video or computer.

Design and technology education

Design and technology is an unusual subject in that it was invented as part of the National Curriculum. Prior to the 1990 (DES) orders for technology we had growing but only sporadic implementation of Craft, Design and Technology (CDT) in the primary years. Where it occurred in primary education, design and make activities were included as part of primary topics or themes. As such, the subject was itself designed and made in 1990 and to an extent is now being evaluated. The evaluation has already seen several steps and rewrites in the form of new versions produced for consultation (DfE, 1992; NCC, 1993; SCAA, 1994) and the latest, post-Dearing (Dearing, 1993) version (DfE, 1995) which will no doubt be superseded. The 'evolution' appears to have been driven more by tensions in secondary education than difficulties in primary (Smithers and Robinson, 1992). Tensions still exist in the subject; the relative weighting on designing and making; balance of elements within the subject (i.e. construction materials, textiles, food); the place of assessment. To some extent, evolution in a subject as young as design and technology is inevitable, but it can produce a frustrating workload for primary coordinators who are teaching a class full-time, coordinating design and technology and possibly another subject or aspect of the curriculum.

Design and technology education is not the same as design and technology. This may sound confusing, but is important. There are many thousands of food technologists, constructors, householders and others who design and make in the real world. Children will design and make real things in the real world—as teachers we are educationalists, and need to focus on providing high quality design and technology **education.** This means providing coherent programmes of education which ensure progressive achievement for all within a broad and balanced curriculum. We must never forget that the primary context includes eight other subjects and where these relate positively to design and technology, we in primary education have a considerable advantage over secondary colleagues, for whom links with other subjects can be difficult to foster.

As was said earlier, we are teaching design and technology in primary education so that the next generation will be confident and able to see a place for technology in many areas of their lives. We may be able to encourage some children who will go on to study the subject in higher education and who may become designers or engineers.

Design and technology education encompasses a wide range of human experience that

may be reflected in the primary context in the relative ease with which cross-curricular links are established. The following links are often made with design and technology:

with science	– materials, their characteristics, uses
	– electricity, its use, components, circuits
	– forces, how they affect structures
	– investigations, to test structures, materials
with mathematics	– measures
	– shape and space
	– scales
	– plans
with the arts	– design
	– form
	– dyeing
	– stitchcraft
	– theatre
music	– amplification
	– materials
	– insulation
English	– communication
	– modelling
	– planning
	– imaging
PE	– balance
	– sequences
	– movement
	– clothing
history	– housing
	– clothing
	– travel
	– theatre
	– medicine

All of the above present opportunities for design and technology education. They are very important as they provide contexts within which design and technology may be applied. Design and technology cannot take place in a vacuum (Kimbell et al., 1996). If one is

designing or making something for the kitchen, it is important that you know what goes on in a kitchen. It will help you to know how kitchens have previously been designed and what tasks will be performed in the kitchen. Your designing and making will be furthered by talking to people who work in kitchens about their needs and it will help you if you understand some of the vocabulary of kitchens.

As well as researching and being knowledgable about the context and the needs of the users, the design and technology coordinator needs to be able to step back, to view the whole, to consider new ways of doing things, new approaches and new products. A great strength of primary education is the expertise primary teachers have in developing a theme or topic around which they will construct the curriculum over a period of time. Primary teachers are experienced at identifying and introducing contexts and ideas in ways which will be meaningful to the children. It is within such contexts that design and technology education will be most usefully placed, thus the child is immersed in a context where familiar and new ideas can be addressed. Vocabulary is familiar and yet will be developed. Design and technology becomes the vehicle for subjects like maths, English, art and science. Existing products can be examined and evaluated, improved or provide the basis for a new round of designing and making.

A useful definition of technological education was provided by the Association of Science Education which was part of their policy statement in 1991.

> *‘ Technological education should form an integral component of the educational experience of all young people aged five to nineteen years. As a consequence of this experience and that obtained in other subject areas, students will be better prepared to develop an awareness and appreciation of the world, its cultures and the influence of the past, present and future technological change.*
>
> I*nitially, young pupils should be encouraged, and helped to identify tasks in familiar contexts, which they are able to complete by drawing upon their present knowledge, understanding, experience and other skills. In doing this, and in following other tasks sensitively introduced by the teacher, students will develop and extend their technological capability until they become self-sufficient, independent of the teacher and able to identify ‘needs and opportunities’. In time, they should have sufficient confidence to generate, evaluate and present their own designs and acquire higher order skills in order to fulfil a particular task. As a consequence of this progressive development in their technological activities and abilities, young people will be enabled*