

Craft and Design Technology*

Introduction

This subject area has developed considerably over the last decade and the title, Craft, Design and Technology, describes more adequately than Handicraft the wide spectrum of activities undertaken in school workshops and drawing offices. The principal aim of Handicraft was the physical and emotional development of boys, mainly through the gradual acquisition of skills. Craft, Design and Technology extends this to provide a fuller experience in which cognitive development features more strongly. Its central aim is to give girls and boys confidence in identifying, examining and finally solving problems with the use of materials. Craft, Design and Technology has an important contribution to make to the education of pupils as part of their preparation for living and working in a modern industrial society.

The aim necessitates the formation of courses which make general and specific demands on all pupils and which encourage individual responses to unfamiliar situations. These responses may be made in both two- or three-dimensional forms. Aesthetic and technological principles underlie the quality of a pupil's statement and, regardless of the nature of the initial problem, all decisions made on the way to a final solution call for an understanding of the fine balance necessary between these important elements. Similarly each pupil's recognition of the restraints surrounding a problem call for an understanding of the physical properties of materials and of the time and resources available.

Problems arise either from the limitations of the designer's own environment, or of that of others, and an expressed need to overcome these, or conversely, from a personal urge to enrich the environment. In either case, it is the creative response which is of paramount importance. It is this which makes complex and interrelated demands on pupils in terms of technological and aesthetic sensibility and requires an understanding of human needs and human values.

As design problems may be selected to promote a real involvement with mathematical, scientific, social, political, ethical and even spiritual issues, the interdisciplinary opportunities offered through the wide range of work associated with Craft, Design and Technology are considerable. However, the quality of experience should be of a high order and may be recognised by the ability of the pupils to perceive, comprehend, analyse and evaluate. Thinking of this kind may not necessarily require a verbal description but may nevertheless be both complex and immediate. Generally, the quality of thinking is related to the excellence of craftsmanship but in some cases it is shown in the level of ingenuity and inventiveness reflected in the work.

The General Skills Involved

It follows that the general areas of skill development are identifiable even though these may seldom be achieved in isolation. The aim must be to develop

skills as they are required during the progress of designing and making. They include:

Technological – to help pupils to use scientific methods of problem identification, examination, hypothesis formation; methods of testing and evaluation; methods of enquiry, research and empirical exploration:

Aesthetic – to develop pupils' abilities to relate visual and aesthetic principles to both two- and three-dimensional forms with due regard for the materials concerned and the ergonomic factors involved in product design:

Discriminatory – to establish the criteria for judging the products made within and outside the school and to develop confidence in the evaluation of these:

Communicative – to assist pupils to initiate and develop thoughts and to communicate these to others; to evolve hypotheses for consideration as possible solutions to problems; to issue instructions and directions to others; to depict the probable final form of a piece of work; to plan a procedure or system of working; to explain a concealed mechanism and so on. Drawing is the usual mode of communication, as words alone are inadequate to portray the infinite subtleties of shape and form. The ability to communicate fully in graphic terms and to read a drawing is essential. Without the ability to draw and develop ideas or interpret the thoughts of others when expressed graphically, the capacity for communication in the modern world is seriously curtailed. Other forms of communication are important and pupils need to be able to judge the appropriateness of such aids as photographs, models or completed three dimensional forms. Language and linguistic skills are necessary in all design-based activities and areas of technological investigation as problems are identified and as ideas are exchanged between pupil and teacher:

Manipulative – to establish sufficient control, by hand methods or by the use of machinery or other equipment, over the more general materials through which design solutions may be expressed. These will include natural and man-made materials. An understanding is necessary of the relationships that exist between the physical properties of materials, the shaping and forming techniques possible and the way in which they may be employed. Few schools may be expected to offer the full range of experience with materials, but all should offer a depth of representative experiences such that pupils may achieve manipulative proficiency. If pupils are to express themselves clearly through materials, a level of manipulative skill must be

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established so that communication of intent is complete and unambiguous. Similarly, the realisation of proposals in three-dimensional materials calls for developing control of movements involving strength and dexterity, as complex skills of manipulation are acquired:

Constructional – to establish an understanding of traditional methods of joining materials and valid ways of testing them, and to explore new materials so that they may be exploited with confidence:

Mathematical – to establish those parts of mathematics which are relevant to three-dimensional form, to size and quality control and to the collecting, organising and using of statistical data.

Content Areas

The ever-increasing range of new materials makes it difficult to identify specific content which is essential to Craft, Design and Technology. Rather, the structure of the course which centres on materials should reflect the specific skill areas outlined earlier. However, within the structure, due regard must be paid to the need for carefully controlled progression, both within each skill area and particularly in the demands made when these are interrelated.

The intensity of the experience offered should be enlivened by an active involvement with technological principles which goes beyond the study of materials. Such experience should illustrate the opportunities that exist for the application of scientific theory to the problems of everyday life. The study of technology should also highlight the possibilities it offers in future for the relief of human suffering, the removal of tedium and the ultimate enrichment of life styles generally. At the same time, the teacher should alert pupils to the ethical responsibilities of the technologist in the preservation of the environment and the conservation of finite resources.

Development of Attitudes

At any level, craftwork provides a sense of inner satisfaction, both in the making and the completion stages, and because of this it plays a major part in the personal development of the individual. Its demands in terms of application, patience, tolerance, compelling interest, sensitivity to both material and form and a commitment to a search for perfection have always helped in the development of valuable attributes.

Craft, Design and Technology is concerned more with the development of desirable attitudes than with an end result or with the acquisition and retention of a specific body of knowledge. Its added commitment to design based activities and to the exploration and exploitation of technology offers further opportunities for the development of altruistic attitudes.

The work should also promote an active and informed attitude towards environmental development. Consumer education, developed from

general design awareness, aims to generate attitudes of concern for the quality of consumer goods in a world market.

Consideration of manufactured goods, and of the opportunities these afford for 'work simulation programmes', aims to develop objective attitudes to possible life styles in industry and commerce. In addition, craft design and technology aims to develop positive attitudes towards a productive use of leisure time.

Exposure to the potential of technology as an instrument for change and to the responsibilities this brings to all should develop attitudes of concern for the future welfare and development of mankind and for the preservation of the environment.

Expectations

Whatever the selected content, there are 'base lines' of achievement expressible in general terms which it is reasonable to assume will be reached by most pupils by the age of 16 years. These are:

- i. the ability to read a drawing and to model or make up an article, using both hand and machine processes;
- ii. the ability to communicate in graphic terms;
- iii. the ability to work and plan logically towards a desired end whether at a conceptual, developmental or production level;
- iv. the ability to recognise personal strengths and weaknesses in terms of Craft, Design and Technology and to plan and work within these;
- v. the ability to evaluate products objectively;
- vi. the ability to anticipate the needs of others and to work cooperatively in practical situations even though engaged on individual tasks;
- vii. the ability to work as an individual, or as a member of a small team, while working on a communal project;
- viii. the ability to realise that personal skills can help the disadvantages through design work generally or community service specifically.
- ix. Some but not all pupils, by the age of 16 years, will be able to identify and analyse a real problem and to produce a well-made solution which satisfies the need.