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## Teaching design and technology in the National Curriculum: the use of video tape

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## TEACHING DSEIGN AND TECHNOLOGY IN THE NATIONAL CURRICULUM : THE USE OF VIDEO TAPE

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### INTRODUCTION

The National Curriculum makes new and wideranging demands on teachers of design and technology. While the documents undergo a necessary period of interpretation and development resources to support new teaching initiatives are understandably scarce. This paper seeks to promote the advantages of employing video tape to support the teaching and learning of design and technology in the classroom. It particularly highlights the development of programmes which address issues of Attainment Target 1 (AT1).

In a recent article, Eggleston (1) reviews the important contribution that the BBC and ITV Thames are attempting to make in the delivery of design and technology. Both companies have considerable experience in the production of educational television programmes and potentially these can be replayed via the medium of video tape. The focus of this paper is concerned with the wider exploitation of the video tape player. The 1980s may be seen as a period in which video matured. However, while new technology has provided alternative means of presenting moving images the humble video tape is likely to be the most appropriate means of delivering video images at present. The laser disc never really progressed in the way that was predicted due to the very high costs involved in production and play-back machines. Subsequent developments such as CD ROM are likely to be more realistic in this respect but are only just becoming commercially available. With the potential of editing your own interactive video programmes, clearly CD ROM will be a major influence in schools during the 1990s but teachers require assistance now as they attempt to meet the requirements of the National Curriculum.

### THE USE OF VIDEO IN SCHOOLS

Most schools possess a video tape player and it has been the extent of this facility that has led many researchers to investigate how it can be utilised to improve teaching in the classroom. Some of the most significant findings concern the exploitation of the educational potential of the video tape player rather than merely using it to replay 'television' style programmes. In their examination of the use of video Choat and Griffin (2) promote modular video tape instead of costly video discs. Their work encourages a greater recognition of the advantages of the video tape player in the classroom when used appropriately. Like videodiscs, carefully produced video tape material provides a resource that is not limited to broadcast scheduling. Also, it may be used by small groups of pupils who can be encouraged to exploit the stop/start, pause, rewind, and fast-forward controls so that true interaction can take place.

The educational advantages of using video in schools are well documented. Elliot for example lists twenty benefits in his book 'Video Production in Education and Training' (3) but it is a particular type of video that is likely to provide the most significant advances in teaching. The achieving of some educational objectives may only require the exploitation of traditional 'linear' programmes: for example, the teaching of routine procedures or techniques. However other objectives exist across the curriculum and these require an alternative approach to the production of video tape cassettes. Crooks and Kirkwood (4), in their analysis of Open University programmes, identify a requirement for students to interpret complex, real-life material. If the objective is to develop such skills then what images are presented and what narration accompanies them must be carefully considered. The facility to stop and replay certain sections is likely to be important and this may be done individually or in groups. The process of stopping, reviewing and analysing is supported by Roberts (5) who views group brainstorming techniques as an ideal means for pupils to order and analyse such real-life material. Roberts's identification of hypothesis-formulation, data analysis and the discussion of evidence are

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important foundation elements to the creative interpretation of contexts as defined by AT 1 of the design and technology National Curriculum

## USING VIDEO IN THE DELIVERY OF DESIGN AND TECHNOLOGY

AT 1 from the National Curriculum for design and technology requires that :

Pupils should be able to identify and state clearly needs and opportunities for design and technological activities through investigation of the contexts of home, school, recreation, community and business and industry.'

Design and technological activity does not need to start with AT 1 but at some point teachers must deal with this aspect. The first three volumes of this six volume video series were all aimed at meeting this need - beginning with an exploration of the meaning of design and technological activity and product analysis as a starting point for such activity and then specifically addressing each of the contexts. Bringing these contexts to the classroom is no easy task and clearly teachers will often opt to take the students out to explore real situations but video is one approach which can be exploited.

Teachers will no doubt use video cameras themselves to bring pictures of, say, recreation facilities or the local community into the classroom - in the same way that photographs and slides have been used in the past, but this is a time-consuming activity. It is also difficult to match the image or editing quality produced by professionals and to which the pupils are likely to be exposed nightly. As the authors have no special competence in making videos it was decided that an attempt should be made to form a working partnership with a professional company, Curriculum Video Ltd of Aberystwyth, in order to produce video material to supplement that prepared by teachers locally. This paper focusses on the authors' attempt at AT 1

Key stage 3 relates to levels 3 to 7 in the attainment targets and programmes of study. The following statements of attainment are taken from these levels.

### Statements of Attainment.

- |          |  |
|----------|--|
| Level 3. | 3a. starting with a familiar situation, (pupils) use their knowledge and the results of investigations to identify needs and opportunities for design and technological activity.  |
| Level 4. | 4a. starting with an unfamiliar situation, identify needs and opportunities for design and technological activity.<br>4c. recognise the points of view of others and consider what it is like to be in another person's situation. |
| Level 5. | 5b. recognise that economic, social, environmental and technological considerations and the preferences of users are important in developing opportunities.  |
| Level 6. | 6b. explain how they have identified needs and opportunities for design and technological activities and give a justification of the conclusion they have reached.   |
| Level 7. | 7c. consider both the user and the producer when defining the need for a technological activity (6).   |

From these statements the expansion which is required in the students' awareness is evident together with an increasing ability to communicate their thinking (6c). Key stage 3 does not however, require a detailed evaluation from the students under AT 1. Only at level 8 (key stage 4) should students be able to :

'provide a detailed evaluation, in the light of a range of considerations, of the needs and opportunities for design and technological activity.' (8a).

It was decided to relate the video series to key stage 3 (ages 11-14) primarily because this age range will be in the first cohorts to begin studying National Curriculum technology in September 1990. It is the first cohort of key stages 1, 2 and 3 (years 1,3 and 7) who begin studying technology in September 1990 but it was felt that video was most appropriate at key stage 3. As far as the early years of schooling are concerned the value of stories, play, the child's imagination and study visits in providing

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rich sources of ideas for design and technological activity has been well documented (7). However, further research will have to be undertaken before the role of video within these ages can be firmly established.

## THE STRUCTURE AND DESIGN OF THE VIDEO PROGRAMMES

The first section of this paper claimed a key role for video in the classroom so long as the potential of video was exploited. Using the video player simply to show 'television programmes' vastly under utilises the potential of this teaching aid. Consequently volumes 1-3 do not set out to present programmes in that conventional sense. The aim was to supply a wide range of video images that would support the teaching of design and technology in the National Curriculum. Implicit in this is the expectation that the teacher can, and must, direct how such images are used. Each volume contains two programmes which, together with an introduction, cover the five contexts for design and technology identified in the National Curriculum. They are :

Volume 1	Programme 1	Introduction.
	Programme 2	Homes.
Volume 2	Programme 3	Schools.
	Programme 4	Recreation.
Volume 3	Programme 5	The Community.
	Programme 6	Business and Industry.

Planning the structure of each programme presented a pivotal dilemma. Should each video simply display a rich and varied cross-section of relevant images, thus placing the responsibility of interpretation onto the viewer? While this may reflect the spirit of AT 1 by allowing the pupil or teacher to identify opportunities with the minimum interference from the programme, it would require a comprehensive library of images and considerable input from the teacher to implement relevant material. The alternative to this would 'spoon-feed' the teacher and/or pupils with clearly defined 'opportunities'. Not surprisingly, an approach based on the advantages of both was adopted. To assist comprehension each programme has a similar structure. After a brief introduction the breadth of each context is presented through 'types'. Therefore, types of homes or types of schools reveal the variety of routes that subsequent analysis could take. How one could set about such analysis is presented in three further sub-sections and for programme 2 'The Home' these are;

- Functions of homes.
- Creating and maintaining homes.
- Homes in context.

Whilst avoiding the explicit identification of the interpretations possible, each sub-section is supported by visual stimulation of 'design opportunities'. Clearly the video can only present a limited selection but with teacher involvement these opportunities could be enlarged through investigative or analytical activity.

Paramount in the exploitation of this resource is the requirement for the teacher to direct the creative use of the video player. Pupils should be encouraged to review, discuss and develop their ideas. Each programme is intended to reveal to pupils how ordinary situations may display a wide variety of design opportunities. The three volumes seek to support AT 1 by inspiring children to investigate their world creatively so as to identify their own opportunities.

## EVALUATION OF THE PROGRAMMES

One of the sharpest forms of evaluation is the market place and early sales figures show that the series was well aimed. It was released in March 1990 and approximately 130 orders were received in the first two months. This is two or three times the level of any of the company's previous products and sales currently stand at 220. Only 8 have been returned, so the remaining purchasers would appear to consider the video sufficiently useful to buy. Videos are expensive to produce and consequently not cheap to purchase (£35 approx). From the company's point of view and the customers' perspective the video may be seen as a very successful product.

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Some interesting feedback was provided on the forms accompanying the 8 returned videos. Obviously these were not necessarily going to be complimentary.

'We were looking for audio-visual material that deals with the specifics of design and technology as envisaged by the National Curriculum.'

'Too general, more ideas needed particularly as starting points.'

'This video is too simplistic for our use. It has some good ideas but the information does not have enough depth.'

'We felt on viewing that this was inappropriate for the course we are trying to develop.'

Current responses to National Curriculum technology mean that there is some inevitability about the final kind of comment. There is a variety of interpretations so the videos are unlikely to be appropriate for all the courses being developed. The earlier comments are more disturbing. We were aiming at key stage 3 in both the images and the language used and 'too simplistic' implies that we have significantly missed our target! The notion that the material needs to be more specific almost runs contrary to the intentions of the series in promoting the ability of the pupils to identify their own opportunities for design and technological activity. This would appear to question the fundamental approach. Some interesting comments were also contained in a letter sent to the company:

'Comment about the content which we tried to watch on a Baker day was that we felt that in some ways it wandered too far - particularly about the 'home'. In effect you spoilt your own excellent presentation and effort (sorry for teacher cliches!) by going too rapidly and switching topics. But it was only one viewing under difficulties (a fault on the soundtrack) and Baker days tend to make everything taste badly'

While all the comments were interesting we needed to get a more quantifiable response. Questionnaires were therefore developed and sent to each of the first 130 customers and these followed the principles as outlined by Taylor in her book 'Planning for Video' (8). There are three major categories of information concerning the programme content which need to be evaluated:

- The presentation in terms of the pace and style
- The level of acceptance
- The relevance and value of the content

The format used for each question is shown below - respondents being asked to tick an appropriate box.

The information in the programme was presented :

Figure 1	Much too slowly.	<input type="checkbox"/>	0
		<input type="checkbox"/>	1
		<input type="checkbox"/>	2
		<input type="checkbox"/>	3
		<input type="checkbox"/>	4
		<input type="checkbox"/>	5
	Much too quickly.	<input type="checkbox"/>	6

Figure 2 (shown at the end of this document) tabulates the questions which were used to evaluate the context of the second programme - 'The Home'. Questions were also added to assess the likely use of the video and an opportunity for comment was provided. Nine replies had been received at the time of writing this paper and the average score is also shown in Figure 2. Scores of 3 and 4 for the questions concerning pace (1-3) were much as hoped. Clusters of 0/1s or 5/6s would imply the programme

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risked losing the audience or boring the majority. We would have hoped for all 6s from questions 4 and 5 but clearly the average scores indicate a very positive response to the style and structure of the programme.

The focussing on design opportunities did not receive great support and this will be developed for later programmes but the responses to questions 7 and 8 indicate a general level of acceptability. Questions 9 and 10 concerning the relevance and value of the content similarly reveal favourable criticism. The evaluation is on-going and programme 1 also appears to be receiving a favourable reception. It is currently being evaluated by several Leicestershire Advisory teachers within schools.

## CONCLUSION

The widespread investment in video tape players means that most schools can exploit resources that appear in this medium with minimal extra expense. Resources are desperately needed if the requirements for providing design and technology as specified in the National Curriculum are to be met. The meeting of Attainment Target 1 is likely to be problematic and specially prepared video tape programmes have been promoted as being particularly suitable for this task. The video programmes that have been written by the authors and produced to date are in the process of evaluation. They would appear to match some people's perceptions of design and technology but not others'. The programmes to date have raised as many questions as they have answered. For example, to what extent is the successful use of images and language related to cultural issues ? Are the messages received the same as those sent ? How significant is the commentary and is it possible or valuable to always present neutral images ? The evaluation of the first video to this series has revealed important requirements for the nature of video tape as an aid in the delivery of design and technology. The further evaluation of video volume 2 (programmes 3/4) and volume 3 (programmes 5/6) is likely to reveal other requirements for video resources. The latest work by the authors is on display as a 'poster' as part of the DATER 90 conference and we would welcome further comments on this work.

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Figure 2 Questionnaire responses to programme 2 - 'The Home'.

