The development of an assessment framework for design and technology at Key Stage 3

DATER 90

THE DEVELOPMENT OF AN ASSESSMENT FRAMEWORK FOR DESIGN AND TECHNOLOGY AT KEY STAGE THREE

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1 The Context

Most of the recent work that has been undertaken on assessment strategies in Design and Technology has concentrated on GCSE work (MEG 1990) (LEAEG 1989), and on the methods of external assessment developed by the Assessment of Performance Unit (APU 1987) which are being utilised during the development of Standard Assessment Tasks. It is in this context that this study was undertaken, in order to develop an assessment framework for Design and Technology at Key Stage Three. The framework was constructed around the following criteria.

2 The Criteria For The Assessment Framework

2.1

It must make use of the assessment structure identified by "Technology in the National Curriculum" (DES 1990). Although it might be argued that some aspects of Design and Technology which are worth assessing, such as an individual's contribution towards group work, are not included within the statements of attainment, this study is concentrating on a framework for assessment which can be developed and refined by individual schools. The baseline for this assessment must be the attainment targets for the Design and Technology Capability profile component. However, as schools develop cross-curricular and integrated approaches to learning, attainment targets from other subject areas could be included in the appropriate sections of the framework, and other sections could be added to extend the coverage of the assessment framework.

2.2

The assessment should be carried out whilst pupils are involved in the programme of activities which have been devised by the school in order to develop design and technology capability. The framework must be able to be used on any and every design and technology activity in which the pupil's are involved. There is no intention that any separate assessment activity should be devised, or that any activities within the normal teaching programme need to be identified as those which particularly merit assessment. This obviously means that activities which are carried out in a traditional Art and Design, CDT, Home Economics, Business Studies or Information Technology environment, must all be capable of being assessed by the same Design and Technology framework.

2.3

Pupils are to be responsible for the assessment of their work. Much of the development work of TVEI has involved pupil negotiation and records of achievement (McCormick 1987). This framework will rely on the pupils being actively involved in the assessment of their activities under the guidance of their teachers (or technology tutors). In areas with this has been attempted and pupils have been made more responsible for their learning, evidence suggests that in the main, they become more involved in their work (Gipps 1990). It clearly follows from this that pupils must be aware of the assessment strategy and realise what they need to do in order to progress from one level to the next.

2.4

The assessment procedure should be simple to operate, and should not be time-consuming. As a professional, a teachers time must be most effective when spent interacting with pupils, guiding, questioning, widening their horizons and giving them the opportunities to develop new skills. Teachers' time should not be spent endlessly ticking assessment grids, matching every statement from the

programmes of study and attainment targets, and producing extensive records of achievement which are rarely read.

2.5

Teachers, working with pupils for long periods of time, are the best people to make an accurate assessment of the capability of individual pupils. Compared with the time spent on Standard Assessment Tests - probably about 12 hours during Y9 - children will be involved in design and technology activities with the guidance and assistance of their teachers for relatively large amounts of time. In schools which are taking the technology tutor approach, this relationship between teacher and pupil will ensure that the progression and continuity of design and technology capability will be carefully monitored, and that progress of individual pupils can be carefully assessed.

2.6

Written evidence will not be essential in order to prove that pupils satisfy certain statements of attainment. In the SATs that are currently under development, only material that pupils write down can be used as part of the assessment process. There are however clearly occasions on which a teacher talking to a pupil about their activity can identify that they have thought about an issue to an appropiate depth, or when working on a practical activity can be observed to be working in a safe and accurate way. It would be wrong if this could only be assessed if it had been recorded by the written word. This could be compared with the anecdotal evidence of several alternative design ideas being recorded after the final outcome has been produced in order to satisfy examination board requirement (Harrison 1990]. If the teacher is there and observes behaviours which clearly match with statements of attainment then there is no reason why that cannot be recorded on the assessment framework.

2.7

The framework should act as a formative assessment tool. In a traditional educational system pupils are likely to change schools at the end of Key Stage 1 and Key Stage 2 and leave compulsory education at the end of Key Stage 4. There could therefore be some limited justification in providing summative assessment at the end of each of these key stages, mainly in terms of schools announcing the standards their pupils have achieved. However, there would seem to be very little justification in a summative assessment scheme for Key Stage Three, particularly at a time where Y9 will no longer be the stage where many subjects are dropped and new options are selected. There is however, clearly a need for formative assessment to be undertaken in order that progression can be encouraged and identified.

2.8

The assessment framework should take into account the holistic nature of a Design and Technology activity. As identified by Harrison (1990), technological tasks are made up of many sub-tasks, each of which consists of aspects of the four attainment targets. By grouping the statements of attainment, from different attainment targets if appropriate, into activities which can be readily identified by students, the holistic nature of technology can be emphasised, and the artificial boundaries encouraged by the attainment targets can be broken down.

3 The Statements of Attainment

As the framework was going to be based on the Technology statutory orders, the statements of attainment were re-written into a form which would be more easily understood by pupils. Less alterations were made to level seven statements as it was considered appropriate that the terminology would be expected to be understood by pupils aspiring towards that level. Reading ages of the statements at levels 3, 4 and 5 were, however, kept much lower.

The first person singular was used throughout the statements to make them more personal and to make it easier for pupils to identify that they had attained certain levels. Pupils would only have to make a simple "yes I can", "no I can't" choice.

The statements of attainment were then organised into eight groups, identified by the following questions.

1 How good am I at collecting information and getting advice from experts ?
2 How good am I at making choices and explaining the reasons for them, when faced with difficult decisions ?
3 How good am I at improving my design, and recording reasons for my decisions ?
4 How good am I at choosing and using the right sorts of materials and equipment ?
5 How good am I at using plans, drawings and models to help me in my design and technological activity ?
6 How good am I at overcoming difficulties ?
7 How good am I at finding out how well the outcome I produce satisfies the need I identified ?
8 How good am I at understanding the effects that technology has on all societies, both now and in the past ?

As the framework developed, these groupings increased and decreased in number, and certainly many other are possible, as witnessed by the many other projects currently working in this area.

However, the justification for selecting these groupings is that they seem to identify broad stages throughout a design and technology activity which pupils in Y7, Y8 and Y9 could easily identify with. They also cross attainment target boundaries, in some way attempting to identify how difficult it is to isolate individual aspects of design and technology and hence emphasising its holistic nature.

For example, the process of collecting information is very similar whether is is for identifying the need for a design and technology activity, for informing the production of a design proposal, or for finding out how to work a particular piece of equipment. Wherever a pupil is collecting information - a process which most youngsters would readily understand - the statements of attainment would be found within one grouping. Some statements of attainment appear in two groupings, as they have two distinctive features within them, but all the statements do appear once.

It is intended that each group of attainment targets being characterised by a question, will encourage pupils to identify with the framework as a way of helping them to progress in their work.

4 How The Framework Would Operate

At this point, the framework could be handed to pupils and they would be asked to tick off each statement as they felt they attained it during the course of their design and technology activities. Although research has tended to show that the majority of pupils when put in such a position of trust, do not abuse it (Gipps 1990), it is unlikely that this approach would be rigourous enough to be utilised throughout key stage three.

4.1 Teacher/Pupil Negotiation

The first stage in the development therefore was that a level could only be said to have been attained when both pupil and teacher agree, a first column being for the pupil to tick and the second being for the teacher's confirmation.

4.2 The Range of Outcomes

The statutory orders identify that all pupils should be involved in D&T activities in a range of contexts and produce at least one artefact, one systems and one environment throughout the key stage. Therefore, as a general rule, it is suggested that pupils must have matched a statement of attainment at least three times whilst being involved in the production of an artefact, a system and an environment, before they can be said to have attained that level.

4.3 Dealing With The Range of Skills, Techniques and Processes

Many of the statements of attainment apply generally to many design and technology activities, whilst others require more specific activities, particularly those related to tools and materials. It is also evident that many of the statements include terms such as "a variety of methods" or "a range of materials", and nothing in the statutory or non-statutory guidance indicates how wide that range should be. It is therefore up to individual teachers, or at least the faculty within the school, to determine how broad the experience should be.

In the interim report of the Design and Technology Working Group (1988), the range of contexts given as examples were large, indicating that pupils would need to be involved in using resistant materials, artists materials, food and textiles throughout the key stage. However, in the statutory orders (DES 1990), the contexts have now been broadened in scope and reduced in number to those of home, school, recreation, community and business/industry giving pupils the opportunity within the statutory orders to "specialise" in one area of Design and Technology.

To take an extreme, and simplistic example, it would be possible for pupils to plan a meal for friends (home), to evaluate school meals (school), to plan a meals on wheels service for the elderly (community), to organise a barbecue (recreation) and to market a new snack product (business and industry). All the contexts have been covered, but breadth and balance can hardly be said to have been achieved. Therefore, although a range of contexts are desirable in terms of breadth of experience and variety, they do not in themselves ensure pupils working with a wide range of materials or developing an extensive range of skills. In a similar way, the programmes of study do not identify specific materials or skills which should be covered.

The choices to be made are therefore up to the school and the pupils. The intention in the interim report was clearly that all pupils should be able to work with a wide range of materials, but because of the lack of any definition for "range" or "number of" in the statutory orders, that intention could be ignored. Whether it will be or not will depend on the degree of empathy which teachers have with the philosophy of the document. Nevertheless, an indication of the materials, equipment, techniques and processes actually used by the pupils will give a better measure of breadth and balance than simply describing the contexts investigated, and will do it in a simple and straightforward way.

Each statement which indicates a "range" or a "number" has six boxes next to it. This aspect of the framework can however, be used in a number of ways, from a very much teacher directed towards a far more pupil centred approach. If we look at, for example,

3 DT 3c I can use a range of hand tools correctly and safely;

The school may identify that the following six hand tools must be used in order to attain level 3c.

needle	hand whisk	scissors
hand drill	tenon saw	fine paint brush

Alternatively, pupils may be able to fill in their own choice of six from lists such as:-

Choose two hand tools from each of the three lists

Group A	**Group B**	**Group C**
scissors	tenon saw	icing bag
fine paint brush	hand drill	hand whisk
clay shaping tool	screwdriver	needle
air brush	bradawl	pinking shears

with or without consultation with their teacher.

A third approach would be to give pupils a totally free choice, but this would make it difficult to ensure a broad and balanced programme would be achieved.

4.4 Recording Progress

One of the overiding features of this framework is that it is seen as the assessment tool for the whole of the key stage. It would be given to a pupil on starting at Y7 and would provide the levels of attainment that the pupil will have reached by the summer term of Y9. As an initial starting point therefore it is considered appropriate that the pupil will have achieved a level when it has matched the statement three times, once for an artefact, once for a system and once for an environment, **and** has completed the appropriate range of six experiences by filling in the choice boxes.

At this stage the pupil will transfer that information to the record sheet at the back of the framework which provides a summary of their progress.

5 Summary

The framework undertook limited trialling during the summer of 1990, and alterations were made to it as a result. It is hoped that more substantial trials will be undertaken by schools in the coming months. A draft copy of the assessment framework will be available at the conference for those delegates who may be interested in developing it for use in their own institution.

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