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Evaluating the work of others at key stage 4: requirements, opportunities and approaches

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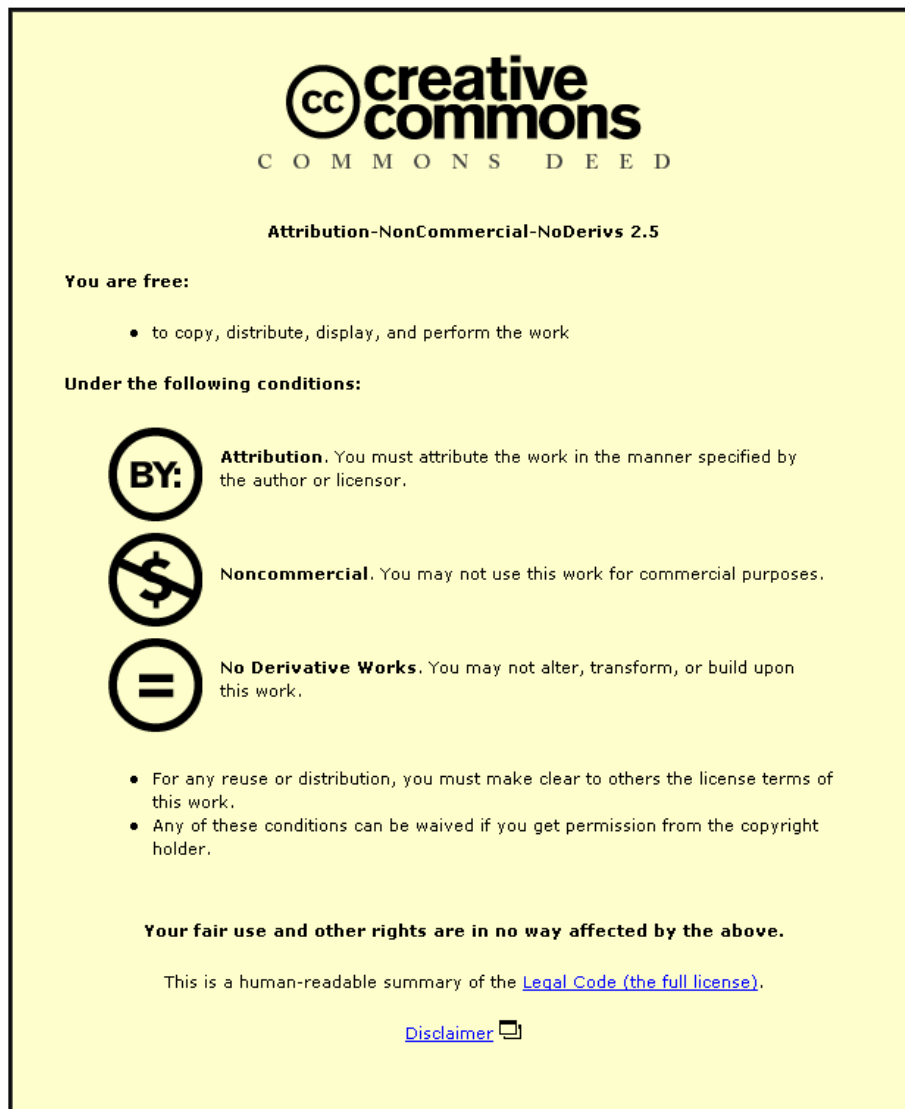
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Evaluating the work of others at key stage 4 - requirements, opportunities and approaches

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Abstract

The existing Technology National Curriculum requires pupils to evaluate the work of others engaged in design and technological activity. This is an area that many teachers have not traditionally dealt with in any depth and requires special care during teaching and assessment. This paper will cover the following aspects of evaluating the work of others:

- 1. Requirements and opportunities within key stage 4 to address cultural and value issues through evaluation of the work of others.*
- 2. Related issues and concerns*
- 3. Approaches to teaching and assessing the work of others.*

Throughout, the paper draws heavily on the experience of Intermediate Technology personnel who have been working closely with classroom teachers.

Introduction

What is new about National Curriculum Technology at key stage 4 compared to previous GCSE courses? Some would say that nothing is new and that the continuation of good practice will, on its own, ensure the success of technology education. To a large extent this is true. There will be different ways of working, perhaps closer co-operation between traditional 'departments' but fundamentally it is felt that little will change.

Looking closely at the existing Order (DES 1990) and the GCSE courses that have followed there are a number of changes to what teachers have traditionally taught. One of the areas that has received little attention is the inclusion of social, environmental and cultural issues. Another is the whole area of evaluating the work of others. Both of these are now statutory at key stage 4 and therefore have to be taught and assessed.

Whilst these two things are a statutory requirement, they should be seen as an opportunity by teachers to widen pupils' perspective in and on technology and make them critically aware of the rapidly developing technology around them.

This paper will look at the requirements of the new GCSE syllabuses in these areas, highlight opportunities to address cultural and value issues through the work of others and then suggest approaches to teaching and assessment.

Requirements at key stage 4

National Curriculum

Since the formation of the Working Group for Technology in 1988, the members of which produced their Interim Report in 1988 (DES 1988) and Final report in 1989 (DES 1989), one of the reassuring aspects of the development of the curriculum has been the continued inclusion of what can be called the wider aspects of technology. These elements are present in the early key stages:

make simple judgements about familiar artefacts, systems and environments, including those from other times and cultures (Level 2)

p15, DES 1990

becoming more sophisticated at the higher levels:

illustrate the economic, moral, social and environmental consequences of design and technological innovations including some from the past and other cultures, using specific examples (Level 6)

p17, DES 1990

Many teachers may well have steered clear, or perhaps paid lip service to, these wider aspects during key stage 3 but this becomes increasingly difficult at key stage 4 where pupils are expected to show evidence of their understanding. This is clearly reflected in the content and assessment criteria of the recently published GCSE courses.

GCSE Courses

Currently, all the examining boards for England and Wales have published a number of syllabuses for courses starting in September 1993. Others are still in the pipeline and should be in the public domain before the courses start (it is hoped!). For the purposes of this paper, I have concentrated purely on the so called 'generic' *Design and Technology* syllabuses. The following quotes illustrate how the different boards have interpreted the 1990 Order in relation to evaluating the work of others:

Evaluating the Work of Others

(a) Social, moral and environmental effects of design and technological activity, e.g. changing patterns of lifestyle.

(b) Criteria for judging the success of manufactured artefacts, systems and environments, e.g. fitness for purpose, cost, quality, efficiency.

p19, MEG 1993

*Candidates should be able to:
Levels 4-6*

(b) investigate existing solutions to design and technological problems;

(j) demonstrate awareness of the principles of fitness for purpose, and how these relate to a variety of conflicting parameters;

pp32-33, NEAB 1993

*Personal, Moral and Environmental Issues
The different aspects of the processes of designing in relation to ethnic and cultural influences.*

Matters of safety, the quality of life, and ethical issues relating to the effect of technology.

p52, SEG 1993

Consider the inter-relationship between technology, the individual and society. Understand that economic, cultural, historic, social and industrial perspectives have implications for technological developments.

Understand the contribution made to technology by various cultures, both past and present through their artefacts, systems and environments.

pp31-32, ULEAC 1993

*Environmental, moral and social considerations
Candidates should be aware of the purpose of*

technology as an instrument of change in the improvement of their own and others' situations, the balance between gains and losses. They should be encouraged to consider human values and attitudes inherent in a culturally, socially and economically diverse society.

Candidates should be able to:

appraise existing, historical and analogous solutions (artefacts, systems and structures) as an aid to design;

p28, WJEC 1993

Do the new GCSE courses constitute a national curriculum?

For many teachers in England and Wales, the period from February to September 1993 will be remembered as a taxing time when they were trying to de-mystify the complexities of key stage 4 National Curriculum and attempting to sort out the parallels and differences between the syllabuses from the Examination Boards. A commonly held view, I suspect, would be that prior to the National Curriculum there was more common ground between syllabuses from the different boards!

This phenomena has come about due to different interpretations of the 1990 Order and the GCSE National Criteria for Technology (SEAC 1992). All syllabuses have a core (5% time) of National Curriculum entitlement derived from the DES document. In order to create a GCSE course, this entitlement has to be expanded (to 10% time) and include extensions into Graphics, Food and Textiles. This expansion has been interpreted by each Board in a different way.

The consequence of this variation is that there will be different experiences for different pupils depending upon which syllabus their teachers choose. Certainly in the area of addressing cultural and value issues, there are widely varying numbers of statements in different syllabuses which could affect pupils' attitudes towards technology in general. Such variation, I would suspect, was not what the original Working Group anticipated nor what the Secretary of State at the time envisaged.

Addressing cultural and value issues

There are many issues to consider when evaluating the work of others. It is, I would argue, almost impossible to evaluate the work of others without making value judgements and without relying on some cultural viewpoint. For example consider evaluating an oil lamp from Togo made entirely from recycled materials. Pupils might well consider

it as 'crude' and 'primitive' perhaps assuming that all lights in Togo are made in the same way. They would clearly be studying the lamp from where they are - a country where the majority of light bulbs are the same and aesthetics for even the most utilitarian items has become important.

This example highlights one of a number of concerns that should be addressed by teachers prior to starting on any work involving cultural and values issues, particularly evaluating the work of others. Three important concerns are outlined below:

Technology is neither good or bad. It is value free...

Such a statement is common and derived from a somewhat naive perception of the world. All technology reflects the culture and values of the designer as well as the perceived culture and values of the users. The development and marketing of watches as fashion accessories shows up well the culture and values of the 'disposable age' where a watch is valued more as a piece of body adornment than as a means of telling the time. Values and design and technology are inseparable.

Values and value judgements are the 'engine' of design and technology. Judgements about what is possible and worthwhile initiate activity; judgements about how intentions are to be realised shape the activity; and judgements about the efficacy and effects of the product influence the next steps to take. Value judgements, reflecting people's beliefs, concerns and preferences, are ubiquitous in design and technology activity.

p36, Layton 1992

Pre-judging

Although the world is getting smaller and more information is now available about the lifestyles and activities of different people, a degree of pre-judging is inevitable when looking at the work of others. This does not necessarily pose a problem when it is recognised. The concern is that pupils and their teachers make assumptions about people, who have produced a product, based on a limited amount of knowledge and experience. Take for example the *Trabant* car which seems to have become an icon of the former East Germany. How many people in the West have condemned it without having any real basis to form an opinion? It could be argued that any car that was used by millions of people can't be all bad! (now there's a value laden statement for you!).

Other cultures seen as being only overseas and 'alien'

One of the major assumptions that teachers have made when referring to the 1990 Orders is that the expression 'other cultures' implies something outside pupils experience and probably outside the country. The very use of the term 'other' implies that the World can be divided into 'us' and 'them' with our dominant culture being the correct one. An interesting feature of the new Proposals for Technology (DFE 1992) is the adoption of the expression 'different cultures' rather than 'other cultures' implying there exists a range of equally valid cultures.

It is, I believe, extremely important that pupils look at the work of others in a whole range of geographically different areas including the school community, rural and urban areas near at hand, other parts of the country, countries and regions of Europe and a range of other countries throughout the World.

Approaches to teaching and learning

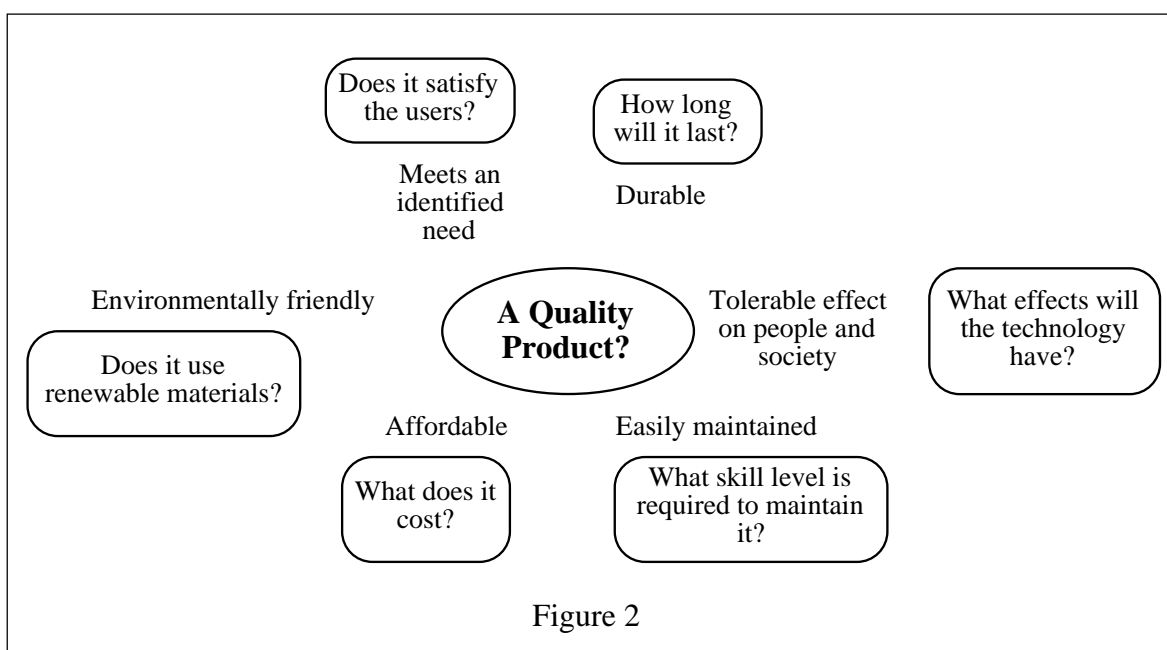
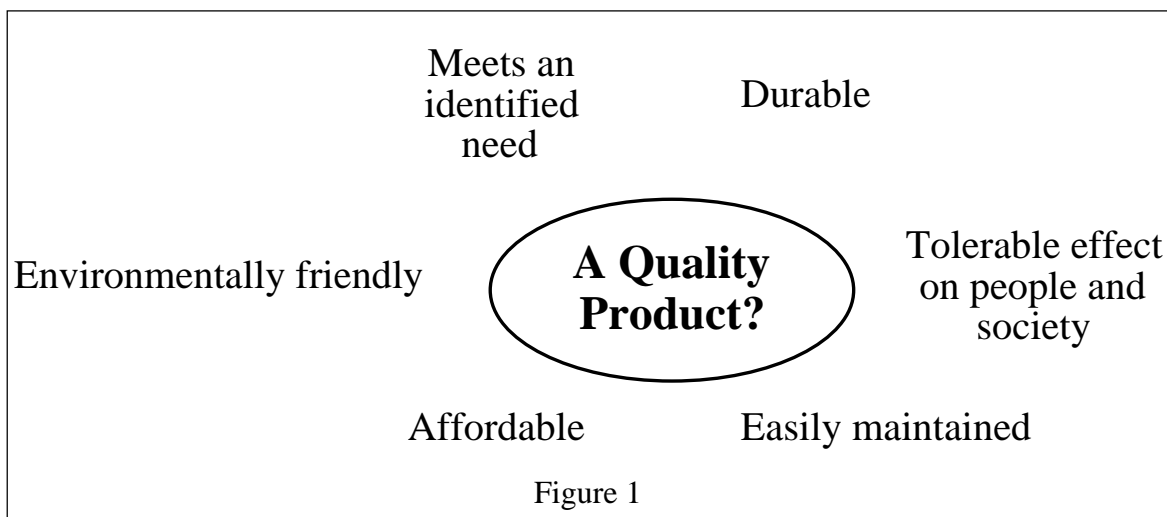
It has been made clear that evaluating the work of others and addressing cultural and values issues are an essential part of pupils entitlement at key stage 4. To date, many teachers have not looked at this area partly, I suspect, because they are unsure of what approaches to take in the classroom. How can a teacher ensure that whilst looking at the work of other cultures, for example, all of the above concerns are met?

Developing Criteria

One of the most useful tools that pupils can develop or adopt is a set of criteria by which any technology can be judged. Pupils can then apply their criteria to the work of others and quickly gain a first impression. How then might a set of criteria be developed and used as a tool? As an example the development of a set of alternative criteria for quality will be explained:

1. Start with a suitable question such as *Is it appropriate?* or *A quality product?*
2. Pupils can then develop some criteria by which they can measure the technology. These can be placed around the question to avoid any perceived hierarchy (figure 1).
3. The criteria can then be turned into questions which then become useful in evaluating the work of others (figure 2).

Removing the inner question and criteria leaves a space where the technology in question can be 'placed'.



Drawing parallels

An important aspect of all good educational experiences is building on existing experience. The drawing of parallels between the work of others and pupils' own experience is extremely useful and should be encouraged. Take for example the evaluation of a fuel-efficient wood burning stove from Sri Lanka undertaken by pupils. Parallels that a teacher might highlight could include:

- Safety of the appliance.
- The smoke and fumes given off, especially when something is spilt on the 'ring'.
- Cost of cooker types and their affordability.
- Shape and form of cooking pots and pans for different purposes. Why have so many?
- Kitchen design and the storage of foodstuffs.
- The aesthetics of the 'cooker'.

Learning from others

Early on in the design development stage of pupils work there should be opportunities for them to draw upon the work of others and learn from what people have done. There is nothing new about this as the majority of design work is really the collection and development of other peoples ideas.

Subjective / Objective evaluation

One of the best ways of approaching the whole area of pupils evaluating the work of others is for teachers to consider how **they** evaluate pupils' work. What is valid as an approach for teachers is surely valid for pupils. What therefore might pupils be encouraged to do?

There are 3 stages that pupils could go through:

- A. An initial subjective evaluation or first impression.

B. Objective evaluation using sets of criteria (e.g. 'appropriateness' and 'quality')

C. Discussion with others, similar to moderation

Following these stages, pupils are likely to obtain a much more realistic idea of relevance and suitability of others' work.

Assessment

This paper has concentrated on GCSE courses. These inevitably involve the assessment of pupils work. How then will teachers assess pupils' understanding of the work of others? Perhaps more importantly how will pupils demonstrate their capability in such areas?

Teachers will be assessing pupils work by using assessment criteria such as:

Illustrate an understanding that artefacts, systems or environments reflect the circumstances and values of particular cultures and communities...

p16, ULEAC 1993

Pupils should show evidence of their understanding. This could include:

- Subjective and objective evaluation of others work at various stages.
- Adoption of design ideas from other people.
- Transcript, tape or even video evidence of discussion with potential users.
- Recognition of the values associated with a particular technology.

Resources

What is required are a range of resources that help pupils and teachers tackle all the above issues and meet the concerns highlighted.

Given that the syllabuses only came out in February there are extremely limited resources around for any aspect of National Curriculum GCSE Technology. Teachers will therefore be forced to make up their own or adopt those from key stage 3. The danger is that these do not cover all aspects of the syllabuses. It will therefore be essential for the Examination Boards to work closely with teachers, and organisations with experience in these areas, thus ensuring all pupils have an opportunity to address every aspect of GCSE courses, particularly the National Curriculum Entitlement.

Conclusion

Evaluating what others have done and taking account of cultural and value issues is becoming increasingly relevant for designers working in the 'real world'. Developing respect and understanding of other people will stand pupils in good stead for life in a politically and geographically ever changing Europe and wider World. Opportunities to legitimately look into these areas are now clear and with increasing support from publishers and outside organisations, teachers can meet the challenge of educating young designers for the next century.

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