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Valuing products and applications

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Abstract
As part of the development of teaching strategies and identification of key educational issues surrounding product evaluation, a conference was held in February 1995 which has subsequently led to the publication of the booklet 'Looking at Values through Products and Applications.'(DfEE 1996)

The booklet has now been distributed along with a number of short questionnaires to determine the current level of product evaluation activities undertaken in schools. Responses indicate that teachers have explored a variety of ways of enabling pupils, across the entire age range, to evaluate products.

This paper highlights some of the issues raised, through the questionnaire, by teachers who already have, or are planning to, undertake product evaluation activities with pupils. These issues, both practical and pedagogic, focus attention on the need for further research, development of teaching strategies and in-service training.

To further understand the process pupils go through when evaluating products, a notion of product evaluation capability is put forward where the development of capability is dependent on attitudinal as well as practical factors. In addition, the use of product evaluation to expose and uncover value judgements is explored. Finally suggestions to develop research and share experiences are outlined.

Introduction

Children are growing up and will continue to grow up in a highly technological society where they will be expected to make decisions about the appropriate use of a wide range of products. In this way their reaction to, and interaction with technology will affect their own lives and this in turn, will affect the lives of others.

For example, the use of products such as video recorders can profoundly affect our social lives. In addition, as consumers of such products we have a distinct effect on employment patterns which in turn affect society as a whole.

Experiences that children have in looking at and evaluating technological products and applications at school contribute to the development of their attitudes, and consequently society's attitudes, to technology in the future. The investigation, disassembly and evaluation of products and applications, now statutory in the revised National Curriculum for Design and Technology (DFE 1995) are likely to be of great importance in this regard.

Efforts to find examples of product evaluation in school during Spring 1995 proved difficult and instead an exploration into perceptions of products and applications was undertaken (Martin 1995). One year on, however, and there are a variety of things happening in schools.

What's happening?

In December 1995, staff at the Centre for Technology in Education decided to start research into values and product evaluation. This coincided with the publication of a booklet *Looking at Values through Products and Applications*. An accompanying questionnaire was sent out with some of the booklets in January 1996 and from responses there is clear evidence that many teachers are undertaking product evaluation activities with children.

From 50 responses received to date, a wide variety of activities were undertaken during the 1995/96 academic year in 18 schools.

Products evaluated by year group
- Yr 1 hand tools;
- Yr 2 holding devices; bags;
- Yr 3 chairs;
- Yr 5 gearing mechanisms;
- Yr 6 watches;
- Yr 7 camera; frame joints;
- Yr 8 ball point pen; pizzas; packaging - tissues boxes; household plug; drinks packaging;
- Yr 9 ties; clocks;
- Yr 12 hair dryers, table lamps, kettles.

Products evaluated in several year groups
- Yrs 3-6 construction kits;
- Yrs 7, 8 & 9 packaging analysis and re-design, also product analysis, re-design and model making; puppets, place mats, containers, pasties, pizzas.

The range of products being evaluated and the variation through the age range is quite considerable but not, perhaps, unexpected given the different perceptions of, and attitudes towards Products and Applications in the curriculum (Martin 1995). The choice of activity and the reasons for selecting particular products have not been fully investigated at this time but this is an area of continuing research. There are, however, several issues highlighted by teachers which can be explored at this time.

Issues

Teachers have expressed a number of concerns which they feel need to be addressed before evaluation of this type can take place. The most popular of these, drawn from the questionnaires received, and two INSET days with Primary and Secondary teachers, were:
- Having enough products;
- Finding artefacts appropriate to take apart;
- Time to undertake such activities;
- Storage;
- Cost.

Most of these issues can be quite easily addressed and it is likely to be only a matter of time before teachers accumulate products, determine which are appropriate to use, and integrate product evaluation into existing activities and schemes of work. The one exception, however is storage which tends to be a general problem in all schools. One, rather cynical, answer to this was to suggest the collection and use of small products!

Those issues raised in questionnaire responses that would appear more difficult to address include:
- Identifying criteria to work with;
- Addressing children's confidence in dealing with contentious issues;
- Superficial evaluation without consideration of wider issues;
- Children's lack of understanding of what criteria they are evaluating against;
- Vocabulary to be able to articulate and communicate;
- Integration into schemes of work.

To these issues raised I would add a couple more which ought to be addressed:
- How effective are such activities?
- If the purpose of an activity is to develop more critical thinking, how can this be measured?

All of the above issues raised appear to emphasise how little is known about the detailed processes of evaluation that children go through and the influences that teachers, and other children, have.

Teachers are in a good position to develop the skills of critical evaluation in children and so allow them to evaluate technological products in more depth, in order to expose the embedded values. To do this, a better understanding of the processes of evaluation that children go through is required.

Before and after

Children's attitudes and values will affect how they look at, use, scrutinise, disassemble and generally become acquainted with products. The quality of the 'evaluating experience' will vary according to the way in which children approach it - beauty being very much in the eye of the beholder! Indeed there are a number of factors which might affect the success or failure of an evaluation of products,

such as:

- Children's attitudes and values
- Teachers attitudes and values
- Teaching strategy adopted e.g. whole class, group or individual work
- Support that teachers give e.g. question sheets
- Children's previous experience of formal product evaluation

The last point is particularly significant as it raises the question of progression and the notion of 'product evaluation capability'.

Product evaluation capability

In attempting to understand the process of evaluation undertaken by children, I would like to put forward the following equation: (See figure 1)

Ideally pupils product evaluation capability will increase allowing them to approach the next evaluation with more experience and a positive attitude. In this way an ever increasing capability will be developed. One poor evaluating experience, however, and a downward spiral may start with evaluation being seen as extra work to be avoided.

The model, although simplified and without a significant research basis, could be useful if one of the aims of undertaking product evaluation is to enable children to evaluate better in the future. Several questions emerge from this model.

- Are there generic 'transferable' evaluative skills independent of the activity and its

associated body of knowledge?
- Is there progression in the types of evaluation activities that can be undertaken?
- How does product evaluation affect pupils' own designing and making?

Answers to these questions, however, are not easily found and will require further research. An important aspect of the notion of product evaluation capability is that of an increasing consideration of values issues - that is, if values issues are important?

Values issues

Underlying, or perhaps underpinning, all design and technological activity are values issues. We, as educators may choose to ignore them but they are nevertheless always there, like a strata in the bed-rock of design and technological activity. This is recognised by most commentators and best illustrated by the following quotes:

> 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)

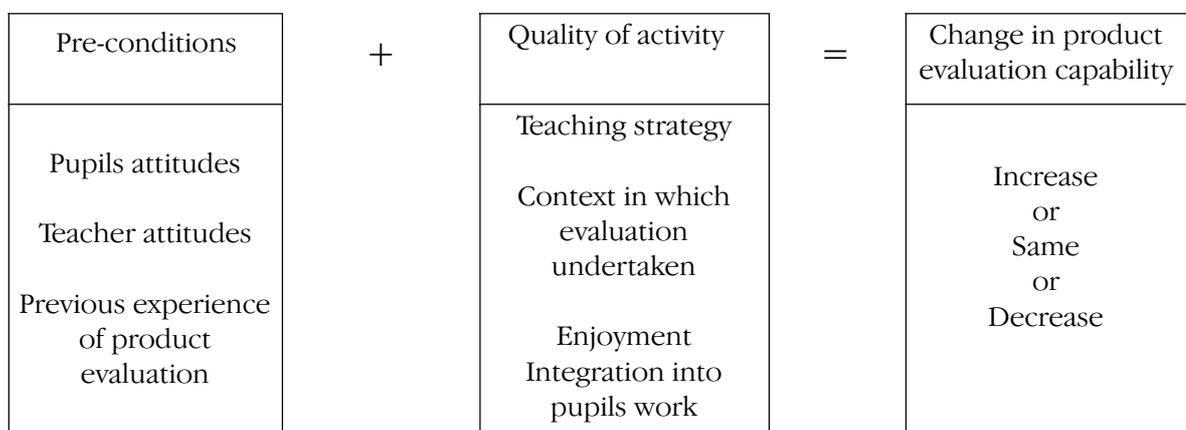| Pre-conditions		Quality of activity		Change in product evaluation capability
Pupils attitudes Teacher attitudes Previous experience of product evaluation	+	Teaching strategy Context in which evaluation undertaken Enjoyment Integration into pupils work	=	Increase or Same or Decrease

Figure 1

Considering values is a critical part of Design and Technology and it follows that teaching and learning about values and experiencing the difficulty of optimising different value positions, is a critical dimension of Design and Technology in the curriculum. p114, Kimbell et al (1996)

Values issues, although ever present are rarely taught openly in the classroom. One of the biggest blocks to developing classroom activities where children exploring values issues, has been the question of how and when do you 'teach values' and what does it look like in practice? Using the vehicle of product evaluation, however, could be an answer.

Looking at values

Evaluating products provides an ideal opportunity to look at values as they are 'near the surface' and there is little uncovering to be done to expose the whole range of personal, social and cultural values that run through products.

The booklet *Looking at Values through Products and Applications* (DfEE 1996) was developed with this very much in mind following the conference *Products and Applications: Exploring Value Judgements in Design and Technology* in February 1995. The booklet:
- considers what is regarded as 'quality' and the 'how' and 'when' of evaluation;
- suggests questions to generate discussion and reveal value-judgements;
- gives ideas for looking at four very different products;
- uses the conference as an INSET model;
- lists the groups and individuals who planned the conference and who are willing to encourage and share approaches and resources.

Although only a small start, the booklet is likely to act as a catalyst for activities where children look through products and applications to see the underlying values. It has already proved popular with a reprint of 10, 000 undertaken within a couple of months! Feedback from teachers is very positive - all welcoming some of the ideas and strategies.

In addition to looking at values within products, some reflection on the effect that products will have on people and society, and how products are valued, will be an important part of developing pupils capability/ technological literacy.

The emphasis should be not on mere artefacts, but on how these relate to social processes; and this should be done in a way that empowers, rather than enslaves.

In a general sense, society will benefit from having people sufficiently technologically literate to answer such questions as:

Who controls the technology?
What is it used to do?
Whose needs and interests does it serve?
Whose life does it enhance?
Who decides where and what technology is used? ...

An ability to answer these questions would constitute a real technological understanding, which is required for a technological society to work - as opposed to technological expertise. (p141, Benyon J & Mackay H 1992)

What must be avoided is the notion that product evaluation is the only area of activity where values can be explored. It may be the easiest but then not all aspects of Design and Technology are easy to teach!

Sensitivity

Children enjoy looking at what other people have done. This is particularly so when the activity is presented as a game such as 'What is in the mystery bag' where objects placed in a bag have to be identified by touch alone. Care needs to be taken to avoid objects from other cultures being ridiculed as weird and stupid.

In addition, care needs to be taken not to isolate children who have particularly strong viewpoints. Referring to the use of repertory grid technique, Siraj-Blatchford says:

Of course, strongly held, conflicting values will sometimes be identified and an open, dialogic approach is required of the teacher. An educational climate of tolerance and mutual respect must be

developed. p200, Siraj-Blatchford (1995)

Ways forward

Teaching materials

Teachers need to collect, select and use products with children in an imaginative way in order to make product evaluation an interesting and meaningful activity.

Teaching materials are needed to support classroom teachers as well as INSET if the evaluation of products is to be an integral part of design and technology education.

Additionally the sharing of ideas should be facilitated through national organisations such as DATA (Design and Technology Association) and the recently formed VALIDATE (Values in Design and Technology Education) - an informal network of educators which seeks to promote discussion of values as an essential dimension of design and technology education).

Further research

Many of the questions raised need to be looked into in more detail before product evaluation can settle comfortably within design and technological activity. Research into the use of *Looking at Values through Products and Applications* is being undertaken by VALIDATE who plan to disseminate ideas and strategies found useful by classroom teachers.

In addition, an extensive research project into the processes of evaluation that children go through is being undertaken by staff at the Chester University College. The research will focus on particular schools to develop case study material which, it is hoped, will form the basis of useful teaching materials.

Conclusion

Product evaluation activities are being undertaken by teachers in schools. A range of issues have been identified and it will take some time before answers to questions arising can be found (if at all!). More research is required as is the development of appropriate teaching materials that help to link product evaluation to pupils' own designing and making. The formation of a specific organisation (VALIDATE) that encourages discussion of values is likely to help teachers develop pupils capability so that they become responsible users and choosers of technology in the future.

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