Making Connections Between People and Products: A Case Study Approach to Developing Values and Dispositions

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Abstract
This article describes and discusses an approach to curriculum development which engages both tutor and student teachers in action based research A partnership between two institutions of Higher Education and two Non-Government Organisations has resulted in the opportunity to explore and develop course materials and work in local school as well as researching into values and disposition for sustainable futures and how these might be developed. With design and technology at the centre of this development it has been possible, over a number of years, to chart how a responsible design ethic can emerge. The focus of this work is the design and manufacture of products, specifically concentrating on collaborative projects within current social and cultural context.

The case study outlined in this article describes work undertaken within the design and technology courses in the ITT programme, whereby student teachers, and the children they work with, are encouraged to analyse and question their own values and disposition through product analysis within a global context, and make connections between products and the people who use them, wherever they are located. The case study also illustrates how research projects, which emerge from teaching, can inform curriculum development with invaluable insights.

This article has developed from a paper given jointly with Juliet Sprake, Design Department entitled 'Connection, products and people: developing design perspectives through small and large scale products' at the *1st Biennial International Conference On Technology Education* Nizhny Novgorod, volga Region, Russia 10-13 July 2002.

Introduction

Education for sustainable development enables people to develop the knowledge, values and skills to participate in decisions about the way we do things individually and collectively, both locally and globally, that will improve the quality of life now without damaging the planet for the future. (The National Curriculum 1999.)

The project discussed in this paper outlines strategies for supporting student teachers in developing their own design ethic. Since its inception the National Curriculum for England: Orders for Design and Technology have encouraged young people to explore and evaluate products as part of their own designing and making process. The complexity of designing and making as a process has been the topic of much debate in recent times with perhaps the most influential

model developed by the Assessment of Performance Unit based at Goldsmiths College in the late 1980s (Kimbell 1991). In this model the designer/maker starts from hazy impressions inside the head which, through discussion, drawing, sketches, diagrams, notes, graphs etc. they develop solutions 'outside the head'. These solutions they then explore further, modelling to 'predict or represent reality' before clarifying and validating by which 'inside the head' process they are able to prototype their solution. The manifestation of their developing thinking is more developed solutions.

While it is vital to look at the relationship between 'inside the head' and 'outside the head' in creative processes, the underlying values of the designer/maker also come into play. Thus the pyramid of 'thought in action' drawn by the APU (Assessment of Performance) team over a decade ago can be seen to stand upon a foundation of prior experience and understanding, that is, values and dispositions held by the designer/maker. The guidelines for reflection, given to the students on the BA(Ed) Primary Design and Technology course and based on Kolb's model of learning, ask them to make connections with their prior experience. Through their experience of working with student teachers, the author contends that support is needed in making these connections, particularly when addressing issues of sustainable futures.

This is not, however, a new debate in design and technology education. A decade ago Budgett-Meakin stressed the urgency of education taking account of the concept of sustainable development by applying the criteria of 'appropriateness' to technology (Budgett-Meakin 1992; Budgett-Meakin 1996). McBrien and Martin demonstrated the importance of the perspective of the teacher in using development education resources (McBrien 1994). Members of Values in Design and Technology Education (Validate) have been active in keeping values on the agenda for curriculum development in design and technology. 'Looking at Values through Products and Applications' (DfEE 1995) was published as part of the development of teaching strategies for product evaluation activities. In reporting on the issues raised by teachers using this booklet, Martin suggests that a notion of product evaluation capability where the development of capability is dependent on attitudinal as well as practical factors. In his paper Martin further explores the use of product evaluation to uncover value judgements (Martin 1996). More recently Kimbell and Perry, in their report for the Engineering Council on

design and technology in a knowledge economy describe 'a move from receiving "hand-me-down" outcomes and truths to a situation in which we generate our own truths' (Kimbell 2001, p7).

To support student teachers in developing 'their truths' and gaining a better understanding of the connections between people and products issues need to be raised which will, in turn, lead to a questioning of values.

Methodology

- The case study is drawn from the work with primary student teachers engaged in as part of their second year courses. This should be seen as action based research, as an aspect of a larger cross-curricular study carried out by WWF Partners for Change project based at South Bank and Goldsmiths Universities.

The work began with a series of workshops through which the student teachers were required to explore and reflect upon the focus of the work i.e. sustainability in product design. During a period of evaluation and analysis, student teachers were engaged in 'hands on' activities to try out and test ideas.

The values and dispositions of second level student teachers on the primary BA(Ed) degree programme were monitored and data collected over two years. Issues raised during an introductory workshop were explored further through the rest of the course. Data was collected through questionnaires, assignments and semi-structured interviews. When the project came to an end in June 2001 the course continued to develop with opportunities for broadening the student teachers' experience of product design and manufacture within the framework of education for sustainable development.

The Project

Context

Strategies for linking issues of sustainability with design and technology education have been developed on the second level design and technology course option on the primary BA(Ed) programme over a number of years beginning with projects which explored environmental issues with support from World Wide Fund for Nature (WWF) (Rogers 1996), sustainability working with colleagues from Oxfam (Rogers 1997) and more recently, sustainable development education as part of the WWF 'Partners in Change' project (Rogers 2002). Since the completion of the college based work further projects in school have been undertaken, working with class teachers and their children and tracking design and technology specialists into their NQT year. This has been funded through the WWF Partners for Change Extension project.

During the primary design and technology course student teachers have the opportunity to explore and discuss issues within the context of product design, looking at everyday objects with an informed eye with regards to the energy, costs and trade issues involved with their design and manufacture. Before this takes place however, the issues are raised through a workshop exploring lifestyle choices and their impact on the environment, other people's lives and options. This takes the form of a challenge to identify a fellow student for whom one of several statements apply, for example, who has been on holiday abroad within the last year; knows where cars run on alcohol; knows what Agenda 21 is or is wearing something made of cotton etc. (Rogers 1997). Having met this challenge the implications of these actions are explored. While not directly related to designing and making the impact of these actions is discussed and supports the student teachers in developing their own framework of questions. Some of the student teachers have reported that their awareness has been raised considerably through this workshop (Rogers 2002). The workshop also sets the context for product analysis.

Food products are used to raise questions which, on further analysis, could be used against a wide range of 'everyday' products. By devising questions to ask rather than identifying information given the student teachers are more likely to raise issues to do with sustainability and globalisation (see Fig 1: A Question of Sustainability 2002-2003 cohort). What they mostly gain from this approach is the realisation that the production, packaging and marketing of these food items is a complex and value-laden process. When the student teachers are asked to evaluate a product of their own choosing the main issues that tend to arise are to do with efficiency, use of material and durability of the products. The concept of 'mystery' products was also introduced one year, when members of the group asked their colleagues to identify the purpose of unfamiliar items. However, the overall emphasis in their evaluations is on life style and sustainability issues of the products.

During the workshops introducing food technology, textiles and plastics forming and shaping techniques, the student teachers are able to further develop their understanding of product design and manufacture, the use, techniques, materials and the needs that are being addressed. The 'Celebrations' project which completes the first section of the course allows the student teachers to explore a variety of contexts for the range of design and

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Figure 1: A Question of Sustainability (2002-2003 cohort): questions asked in evaluating food products

Is the packaging recyclable?
Is the packaging made from recycled materials?
Is there any direct/indirect harm to the environment in its production etc.?
Where did it come from?
What happens to the waste by-products?
Is all the packaging essential?
Are the producers getting fair money for the work they have done?
Where does the product come from?
Are the stocks of tuna sustainable?
Are any pesticides used in the manufacture of the tea?
How it it imported?
Does any of the profit go into counteracting anything that has resulted from its production?
What is the cost of recycling glass/plastic?
Does the country produce other products?

technology activities. These they research and, through 'hands on' activities, produce some excellent examples of cross-curricular links with design and technology. They are also given the opportunity to share and negotiate over the use of resources and facilities.

Outcomes/insights gained

In terms of the data collected over the two year period from 1999-2001 comparisons can be made from the student teachers' responses to the questionnaires (see Figure 2). Compared to 18% of the previous cohort, 37% of the second level student teachers questioned during the 'Partners in Change' project reported an increase in their prior understanding of sustainability at a good or very good level. At the other end of the scale 26% reported that they had no understanding of the issues compared with only 18% of the previous cohort. The biggest change in

Figure 2: A comparison between cohorts of student teachers' prior understanding

understanding was the 37% who reported a limited understanding compared with 64%.

Using reference to values and attitudes to

Figure 3: Inclusion of reference to values and attitudes in assignments (2000-2002 cohort)

technology in the assignments set to measure the level of understanding demonstrated at the end of the course, those making no reference to value and attitudes to technology had dropped to 12.5%. Over 75% had addressed values and attitudes to technology well with more than half of the group demonstrating a very good to excellent understanding of issues of sustainable development education, making the connections between design and technology activities in school and wider development issues (Rogers 2002).

Through semi-structured interviews and feedback from school-based work further insights have been gained as each cohort moves into the third level and more specialist course. These student teachers are asked to conduct a designing activity using a range of everyday products to investigate and evaluate. One student teacher used lunch boxes with a class of six to seven year-old pupils. The pupils were given the opportunity to work in pairs during their evaluation sharing the same A3 sheet of paper folded into different sections. The activity required them to engage in skills of discussion, negotiation and compromise as they designed their own 'ideal lunch box'. The student teacher had included a straw basket from Trinidad in the selection as well as the plastic carrier bag she was using for her own lunch. The pupils were fascinated by the story behind the straw basket and the flight home that was nearly missed while she was purchasing it. The strategy she had used in her teaching to address sustainability was similar to that used on the course 'looking at manufacturers, costs and the effects on society, on them and the environment'.

While student teachers on the primary design and technology courses are encouraged to make collections of products to use to support designing activities, when this student teacher made the connection between everyday objects from different cultures, she was able to offer a far richer experience for her pupils. When designing and making musical instruments with nine to ten year-old pupils two student teachers were able to use a range of 'fair trade' products.

Further developments

The impact of the Teacher Training Agency Standards for Initial Teacher Training which came into force in September 2002 has led to significant changes in the programme offered to first and second year student teachers. While these new requirements highlight values teachers should hold, they also allow providers to scale
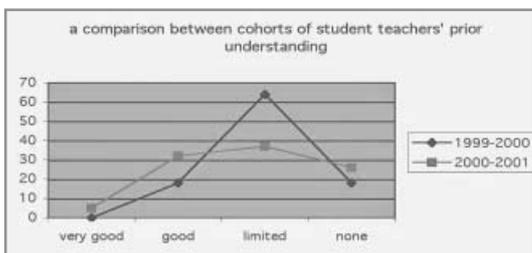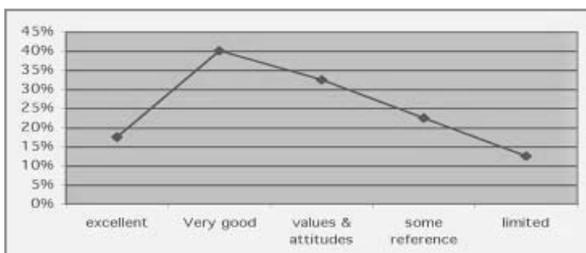
down or even omit training for design and technology education for primary school teachers.

The WWF Project has now moved into an extension phase reaching out into school-based work, and is due for completion and dissemination in 2003. Work with the recent cohort of student teachers has developed into unexpected directions. Education for Sustainable Development (ESD) is promoted by the Qualifications and Curriculum Authority but the relationship between design and technology education and ESD is not as yet recognised.

Against this background of change, new courses have been developed and implemented. Whereas the work described earlier has been undertaken with two groups of second year students (half the year group), in the current academic year all first year students have taken part in a seminar looking at the issues, analysing food products and a range of artefacts selected for the issues inherent in their design and manufacture. This will allow for further development of the second year course, next year, to extend this work into school-based planning and implementation. This will also present further opportunities for research as the effectiveness of a short seminar for all students is balanced against that of a much longer input with half the cohort. Further developments in the second year course will also offer opportunities for student involvement in research initiatives when embarking on their research reports in their final year.

Design and technology education has much to offer young people to 'develop the knowledge, skills and values they need to be active and informed citizens' (QCA 2002). Indeed, aspects of the new requirements for education in citizenship resonate with a design ethic that recognises the value judgements made in the design and manufacture of products.

Citizenship gives pupils the knowledge, skills and understanding to play an effective role in society at local, national and international levels. It helps them to become informed, thoughtful and responsible citizens who are aware of their duties and rights. It promotes their spiritual, moral, social and cultural development, making them more self-confident and responsible both in and beyond the classroom. It encourages pupils to play a helpful part in the life of their schools, neighbourhoods, communities and the wider world. It also teaches them about our economy and democratic institutions and values; encourages respect for different national, religious and ethnic identities and develops pupils' ability to reflect on issues and take part in discussions. (QCA 1999)

Summary

The case study above described asking questions which could then be applied more universally. By identifying which of the questions related to issues of sustainability it was clear whether or not the term itself was understood. The needs of the producer of products were highlighted and questions framed to do with cost not just in terms of value for money but also in terms of impact, of energy used in transportation, etc. Using this as a starting point for further workshops in design and technology ensured that the issues had to be addressed, particularly in respect of the use of resources.

This work often moves student teachers outside their 'comfort zone', asking them to make connections between themselves and the needs and wants of the different people involved in the design and manufacture of the products, connections that may have a profound effect on the way they view products in the future. The difference between the student teachers' prior knowledge and understanding and how they make the connections to their work with children demonstrates a reasonable success in this approach. As other research has shown, engagement of the teacher is essential for effective work with children in school. It is to this end that the extension project to the WWF Partners in Change, being conducted this academic year, aims to track former design and technology specialists into their first year of teaching to get a measure of how effective their experiences on the course have been.

Conclusion

This project, funded by WWF but based within the teaching of the primary design and technology courses at Goldsmiths, redefines product analysis to be driven by values and dispositions of the student teachers concerned. Empathising with the user/producer as much as with the function and aesthetic supports the development of a design ethic that pervades the rest of the design process. Within this debate asking questions rather than seeking more obvious or immediate solutions supports an empathetic approach to designing.

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