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Abstract

Following a design and technology specialist module as part of the third year of my BA (Hons) primary education at the University of Central England, this paper reports on and examines my findings concerning children's ability to design. Part of the module involved working with a class from each key stage at a local primary school. As a group of five design and technology specialists, we planned and taught units from the Qualifications and Curriculum Authority (QCA) scheme of work over four lessons. The topics that we covered were:

- Year 3: structures, unit 3D photograph frames
- Year 2: textiles, unit 2B puppets.

We were based at a Roman Catholic primary school, which is a beacon school for design and technology. The school is well-resourced, and the children are enthusiastic about their studies.

Introduction

My observational focus whilst teaching and working in each class was the children's understanding of designing and the suitability of drawing as a design tool. Many children *'when asked to model their ideas by drawing them, make drawings which do not clearly relate to the product which they subsequently make'* (Egan, 1999, p.79). I chose to concentrate on this aspect of designing because OFSTED has repeatedly expressed cause for concern over designing being an area of weakness:

'Pupils' designing skills have lagged behind their making skills because most teachers are unsure how best to structure and develop this aspect of design and technology.' (OFSTED, 1998)

I decided to collect qualitative data by making notes on the children's understanding of the design process through observations and discussions with the children. Quantitative data collection would not be appropriate because design ability is not a simple can/cannot issue. The aim of the discussions was to elicit a definition for designing from the children. The questions that I asked each child were not the same because every child has a slightly different understanding and responds to interviewing in a slightly different way.

I first became aware of this gap in children's understanding when teaching the QCA unit 'Moving Monsters' to a Year 3 class. All of the children drew a design and produced a

final product, but only two or three final products actually resembled the drawings. On reflection, I realised that my explanations had not been explicit enough:

'More is needed than a simple instruction to draw an idea prior to making' (Egan, 1999, p.83)

The children understood designing as drawing a picture, but did not relate that picture to the product they were going to make afterwards. By contrast, in a Year 1 topic on designing and making sweets for a specific person, children had a better understanding of their designing. I explained to them that the purpose of their design sheet was to plan what colour and flavour sweets they were going to make so they knew their intended consumer would like the sweets.

The designing lesson in Year 1 was more successful because I anticipated that the children would not know what designing is. Consequently, the worksheet they had to complete was very simple, and we discussed how and why certain design decisions would be made to please the consumer.

Group teaching

In our group teaching, I think we took it for granted that all the children understood what it meant to produce a design and so did not teach this area in enough depth. The group decided that a different pair would take the main responsibility for planning and delivery of the lesson each week. We decided that this would enable those not leading the session to have more time to make observations and discuss the children's work with them. We decided to plan an overview of what would happen each week together. The specifics (lesson plan, assessment, etc.) would be left to the pair leading the session.

The main down side of this approach to planning became clear after the second lesson with our first class (Year 3). There were aspects of the fine planning (the delivery of explanations etc.) that I felt could have been improved if we had discussed the lessons in detail as a group. We all have different experiences of design and technology from our teaching practices, and there are misconceptions that occurred during the lesson that we could have avoided by thinking them through before the lesson was delivered. For example, the instruction to 'draw a design for your photograph frame' largely depends on the children's prior knowledge of what a design is. From my own experience, I know that sometimes a class seems to have a good understanding of what a design is. They answer questions about it and give simple definitions, but, in fact, their understanding is

only at a very basic level. An effective designer requires a much more in-depth understanding in order to produce a design that is really useful and not just a picture.

Hindering providing children with an in-depth understanding of the design process in recent years has been the 'squeeze on the foundation subjects' (Bowen, 1999, p.36) and the wish for a 'narrowing of the subject's expectations' (p.38), in order to fit it into a timetable dominated by literacy and numeracy. Children often do not get the chance to design, including modelling, other than through drawing, as the end product is seen as the main point of the unit of work.

Findings

Below is a selection of definitions for designing from the children I worked with:

Child A: 'It's doing a picture.'

Child B: 'It's drawing a picture of what you are going to do.'

Child C: 'A design is when you draw your ideas. I couldn't have done it so well if I hadn't done a design because I couldn't remember everything and I would have forgotten what I wanted to do.'

Child D: 'It's like if you want to make a garden shed. You draw it first and if you draw two windows, then you make one with two windows. But you can change it if you want. Father Bradley does that. He says to do something one way, and then he changes his mind and Mrs Smith gets annoyed with him.'

The first two responses were typical of Year 2 – a popular phrase that teachers use to explain the task to children (Egan, 1999, p.83). The last two responses show improving understanding of the term from Year 3 children. Child D's response is beginning to relate designing to being a process. She recognises that ideas can be amended as you go through the design process. This was probably the best definition I found in the class. The subject of the explanation (the shed) demonstrated that this was knowledge she had learnt from outside school (this child was actually away for a main designing lesson). Moyles (1995, p.100) states, 'Relate the topic to children's lives and experiences as far as possible' as a 'golden rule'. The mention of Father Bradley and Mrs Smith gives an example of how the design process of changing ideas could be explained to children in simple terms unrelated to design and technology. If we had taken the time to discuss designing with the whole class and shared these definitions, I believe the children would have produced more effective designs because they would have understood the

purpose of the drawing activity in relation to the making task.

The National Curriculum attainment targets for design and technology (QCA/DFEE, 1999, p.25) state that at level one children should 'use pictures and words to describe what they want to do'. This was clearly achieved by all of the Year 3 children and most of the Year 2 children. Three Year 2 children needed a lot of support to relate the ideas they were trying to draw to the animal puppet that they were going to make. The level two description adds the word 'design' to this expectation and states that children should select 'appropriate tools, techniques and materials, explaining their choices'. Around half of the Year 2 children were working towards achieving this level. They included labels on their drawings and could say what they were going to use and how with little prompting. Other children in the class could draw what they wanted their puppet to look like, but needed support to suggest how they could do it. The Year 3 children showed the progression between the two years by independently selecting materials and techniques in most cases.

Assessment

At the end of the unit with Year 3, we assessed the class understanding and achievement of the objectives by completing an assessment grid. We each completed this for the table group that we were working with. I found that assessing just a small group gave me the opportunity to interview children about their understanding, rather than just assume they had absorbed the information taught to them. The example of Child D was just one instance where I was able to give a truer assessment of her understanding of designing that I would not have been able to see from her incomplete written work.

'The assumption is frequently made that what the child has produced...is typical of ...their ability' (Hope, 2001)

The question of reliability of assessment techniques was highlighted when I compiled our assessments. We had discussed the assessment criteria before the lesson, but had completed the grid in different ways. Whereas I had interviewed each child as they worked, others had completed the grid through non-involved observation or through looking at children's work when they had finished. When we discussed the results afterwards, there were certain marks that stood out as questionable.

'Assessing pupils' capability in the process of design and development is a far more complex matter than simply assessing their knowledge and skills.' (Kimbell, 1997,

p.XI)

I believe interviewing alongside written work and final products is the most accurate way to assess primary design and technology as it enables the teacher to elicit more about the child's understanding, rather than just their recording and making skills. Kimbell (1997, p.29) describes 'practical skills...procedural skills...judgement ... and even emotional toughness' as areas that need to be developed in design and technology to demonstrate achievement. These are not always areas that primary children will be able to sufficiently demonstrate through written work and finished products.

Quality design work?

In trying to evaluate the quality of the design work undertaken with each year group, I would suggest that the Year 2 work was not as good as it could have been. This was because, rather than being given the scope for individual planning and thinking about how to design and make their puppets, the work that the school wanted us to complete with the children was very prescribed. There was quite a severe curb on possibilities. For example, the children had to produce a glove puppet, use felt, use running stitch, only have a choice of four animals, and they had to be completed by session four. This resulted in sheet after sheet of almost identical designs.

The Year 3 work I feel was more valuable in developing children's designing skills. They were able to make more independent choices and consider how things could be done for themselves. They had greater ownership of their work.

Conclusion

My experiences suggest that some children are not taught the value of the design process. Chalkley and Shield (1996, p.50) discuss that, even in a class well provided for and experienced in design and make activities, 'designing' became a chore which had to be undertaken rather than a valuable build up to the final product. This is in danger of happening when, as in Year 2, designing is not a valuable part of the process, but a worksheet that has to be completed before practical work can begin. Children see designing as a boring drawing activity, rather than a process of which drawing can be a part and making is a final summation of ideas. Some of the puppets and photograph frames produced in school were of far greater quality than their designs would suggest.

'Drawing can be seen as the objectification of an inner image' (Hope, 2000)

As such, teachers tend to rely on it as a way

of getting evidence of children's designing. This is because drawing is the most manageable classroom design tool. But drawing may not be a realistic way of expressing design ability. I believe the 'lagging behind' of design ability in schools is due to the fact that the way children are expected to design is so unnatural. Maybe the answer to improving pupils' designing skills is to completely restructure how it is taught.

Medway (1992, p.73) suggests that in the real world people who design and make a product themselves 'do the designing entirely in their heads'. This would suggest that the way to improve children's design ability in the National Curriculum could be to stop expecting them to perform such a specialised function (Medway, 1992, p.73). Children could undertake separate units of work where the focus is either on designing or making, unlike the current design and make activities (QCA, 2000). In the making units, they would not have to express design ideas in too much detail, and what is done could be done through photographs of 3D models and tape-recorded discussions with a teacher/adult helper. In designing units, tasks would involve thinking about and designing products for a specific purpose that someone else could then follow and produce – as in a real life manufacturing process.

References:

- Bowen, R. (1999) *Primary School Design and Technology in the Era of Literacy and Numeracy*, in *Second International Primary Design and Technology Conference*, CRIPT, pp.36-41.
- Chalkley, C. and Shield, G. (1996) *Supermodelling! Developing designing skills at Key Stage 2* in *The DATA Journal*, Volume one, Spring 1996, pp.50-57.
- Egan, B. (1999) *Children talking about designing: how do young children perceive the functions/uses of drawing as part of the design process?* in IDATER 99, Loughborough University, pp.79-83.
- Hope, G. (2000) *Why Draw Anyway? The Role of Drawing in the Child's Design Toolbox*, in IDATER 2000, Loughborough University. http://www.designdrawing.net/my%20papers/idater_2000.htm (November 2001)
- Hope, G. (2001) *Young Children's Drawings as Finished Products*, <http://www.designdrawing.net/biblipage.htm#finprods> (November 2001)
- Kimbell, R. (1997) *Assessing Technology*, Open University Press.
- Medway, P. (1992) *Constructions of Technology: Reflections on a New Subject*, in Beynon, J. and Mackay, H. *Technological Literacy and the Curriculum*, Falmer Press, pp.65-83.
- Moyles, J. (1995) *What shall we do today? Planning for learning – children's and teachers!* in Moyles, J. (ed) *Beginning Teaching: Beginning Learning*, in *Primary Education*, Open University Press.
- OFSTED (1998) *Primary Education, A Review of Primary Schools in England, 1994-1998*. '12.5

Design and Technology' <http://www.official-documents.co.uk/document/ofsted/ped/ped-12.htm#12.5> (October 2001)

QCA/DFEE (1999) *The National Curriculum*, QCA/DFEE.

QCA/DFEE (2000) *A scheme of work for key stages 1 and 2: Design and Technology*, QCA/DFEE.

