

Starting the Journey: Discovering the Point of D&T

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Abstract

Starting with the question 'Why teach Design and Technology in secondary schools?', this paper describes the first stages of a journey to discover a values framework for D&T in English secondary schools.

Events and reflections, some of which are described, have informed the initial stages of my PhD studies which is to develop a framework defining the value of D&T in secondary school education in England. This paper is a presentation of some initial findings for the framework.

This is only the start of my PhD journey in which there are three stages:

1. An exploratory study of interviews and personal rationales to develop a framework of the value of D&T,
2. Using the framework to make judgements about the profiles different stakeholders have of the subject
3. Using the framework, evaluate the practice in schools

The values reported here have been identified from two stakeholder groups: trainee D&T teachers from my own university and D&T academics. At this stage in the study I am not comparing the values held by different stakeholders only in discovering their values which will inform the values framework.

At the start of their D&T teacher training my students write a personal rationale on why design and technology should be part of the secondary curriculum. A coding method from grounded theory was used to investigate and analyse the rationales (Aurebach ad Silverstein, 2003). The second data set for the framework came from interview transcripts with four D&T academics and was analysed using the same coding methods. Combining these led to the formation of the first version of the framework that consists of twenty-two value statements. It is expected the framework and method presented in this paper will stimulate debate and contribute to both the author and wider community's thinking about the value of D&T.

Introduction

'Why teach Design and Technology in secondary schools?' is a question I ask new cohorts of trainee D&T teachers during an introductory session. During this I share my own values of D&T, which when I started my career as a teacher educator I found difficult to articulate concisely or with clarity. After one of these sessions I stood back and reflected: 'Are these my values or am I just repeating what I have read and heard? Do I believe what I am saying is the value of D&T?' This made me reflect on what exactly were my values and could I define them more clearly?

After the session students are asked to think about the contribution D&T makes to pupils' education, and afterwards write a brief piece entitled 'A Rationale for Teaching D&T'. Within this writing students emphasized different values of D&T: some focused more on the benefit of learning skills for employment ('create many opportunities such as future employment prospects'), others talked about the value of developing their creativity skills ('opportunity for pupils to think creatively'), other looked at more philosophical values ('greater understanding of the workings of the world').

This led me to question whether there were any common values within their different responses? Based on subsequent reading about values (Braithwaite & Law, 1985; Rokeach, 1973; Schwartz, 1994; Thurstone, 1959) I believe, maybe naively to some, there must be some common ground: a value series/framework of D&T. Steve Keir last year discussed the challenge and the potential impossibility of finding common ground (2012); this paper begins to respond to his challenge.

Rokeach proposes that a value 'becomes, consciously or unconsciously, a standard or criterion for guiding action, for developing and maintaining attitudes toward relevant objects and situations' (1968, p.160). Accepting this explanation means the values a person holds of D&T will inform their behaviour towards the subject. For different stakeholders this could be how they engage with, teach, think about or act towards D&T. Looking back to the students' rationales I began to see how this would affect their approach and teaching in a school.

An example of how different values can impact on D&T occurred during this time of personal reflection, highlighting to me why it was important to clarify the value of D&T. The new Secretary of State for Education had launched a 'Call for Evidence' about the National Curriculum in England, an aspect of which could have implications for D&T: 'Should all school subjects be compulsory' (Department for Education, 2011), that is: were some more important than others? The result of this consultation led firstly to the value of D&T as a key component of a child's education being questioned (Great Britain, 2011) and secondly a new D&T curriculum proposed which emphasized the domestic and life skills aspect of D&T (Department of Education, 2013). As expected there were vocal responses from the D&T community (Barlex et al., 2012; Design and Technology Association, 2011) and others (E4E, 2013; Hardy, 2013; Prince, 2013; Royal Horticulture Society, 2013).

During this I wondered if the fragile position of D&T in the curriculum was really a surprise? D&T is comparatively new in England; first coming into being as a compulsory subject in 1992 following the 1988 Education Reform Act (Toft, 2007) after an evolution of over one hundred years (Eggleson, 1976; Penfold, 1988). Previously it consisted of separate subjects such as craft, home economics, sewing and technical drawing which is how many who are involved in influencing and shaping the subject today experienced

it. A further consequence and change in focus for D&T, which could be as a result of or effect stakeholder's values, has been that since its inception as a single subject in to the National Curriculum for England and Wales it has gone through four National Curriculum reviews in 1993, 1999, 2005 and 2012 (House of Commons, 2009), resulting every time in changes to either title, content or both. As a result of its history and subsequent changes, it is my belief that stakeholders in D&T have different definitions of its identity and value, which may manifest as a lack of understanding between the different stakeholder groups.

I identified four main stakeholder groups as part of my preliminary thinking about these groups:

1. Shapers, e.g., Secretary of State for Education, head teachers, non-ITE university lecturers.
2. Users and consumers, e.g., Pupils, employers and businesses.
3. Influencers, e.g., Parents, non-D&T teachers.
4. Holders, e.g., D&T academics, teachers, teacher educators and trainee teachers

These events and reflections have informed the initial stages of my PhD studies which is to develop a framework defining the value of the D&T in secondary school education in England. This paper is a presentation of some initial findings for the framework. At this stage in the study I am not comparing the values held by different stakeholders only in discovering their values which will inform the values framework. The comparison of values held by stakeholders will form the second part of my study.

Finding The (or a) Values Series of D&T

The aim of this stage of the research is to construct a values framework using textual data generated by individual stakeholders in which values of D&T are discovered. A purposive sample representing the above different stakeholder groups is being used. The analysis method is based on a coding technique from Auerbach and Silverstein (2003) which they describe as taking small steps up a staircase moving from a 'lower to a higher level of understanding ... (of) your research concern' (p. 35).

The values reported here have been identified from two stakeholder groups: trainee D&T teachers from my own university and D&T academics. These groups have been labelled 'students' and 'experts'. Both groups are within the field of D&T, which I recognise is a limitation and will be discussed later in the paper. Thirteen students gave consent for use of their rationales mentioned at the start of this paper. Four experts told me their values of D&T during face to face interviews.

Described below are the two phases and two steps in each phase based on Auerbach and Silverstein's coding method. Some anonymised examples from the data are included for clarity.

Phase 1: making the text manageable

Step 1. Identifying the research concern: What I want to learn and why
 What: I want to identify the values the two groups hold about D&T.
 Why: to create a values framework.

Step 2. Selecting the relevant text

This involved scrutinising each line of the text and copying relevant text to a new document. Each copied word or phrase I judged to be an example of a value (note: Auerbach and Silverstein call these 'ideas'). For example from the sentence 'D&T is everywhere; it is such a diverse subject which can create many opportunities such as future employment prospects' the text 'future employment prospects' was selected as relevant.

Phase 2: Hearing what was said

- Step 3. Repeating values: 'record repeating ideas by grouping together related passages of relevant text' (p.44).

The values from step two were grouped together and called 'Repeating Values'. Repeating value number six from the students' data is included below as an example. Each bullet point is an individual value identified in step two. The repeating value is named using an excerpt from the original text. This minimised overlaying the interpretation of other's values with my own.

Repeating value 6 – encouraging the pupils to challenge, explore and question their surroundings

- practical and theoretical exploration of relevant physical objects and structures, encouraging the pupils to challenge, explore and question their surroundings
- as we are surrounded by it; everything we wear and eat are products of D&T
- everyone is aware that the first part of being a discriminating user of a product is deciding if the product is needed at all
- look at their surroundings with 'new' eyes
- challenge expectation
- evaluate products from the past and inspiring them to design products for the future whilst exploring the aspects of current consumerism
- learn from past designers, inventors and manufacturers

- Step 4. Themes: 'Organise themes by grouping repeating ideas into coherent categories'. (p. 43)

In this step the repeating values from both groups were brought together to create a master list of values.

After these four steps the master list of values were tested through returning to the original text to check and refine the values. This was to minimize the loss of meaning through removing further away from the original data.

Findings

This section will only report on steps three and four as these led to the final series of values.

Step 3. Repeating Values

From the students' text: grouping the relevant text (phase one) produced twenty- five different values and seven 'orphans' (text which is not repeated) (Auerbach & Silverstein, 2003).

From the experts text: seventeen different values were identified with only two orphans.

Step 4. Themes (Creating a Master List of Values)

Initially there were twenty-two discrete value categories organized from combining the repeating values from students and experts.

- Fifteen values had repeating values from both stakeholder groups. All of which had only one repeating value from the expert group; seven had more than one repeating value from the student group.
- Two had repeating values only from the student group.
- Five had repeating values only from the expert group.

Through this process I was able to place all of the repeating ideas and orphans and one of the student repeating ideas (i.e., number two: aware of the impact of technology on society now and in the future) was included in more than one value category. After this process each category had a summative sentence written using the writing frame either 'I believe D&T is of value because....' Or 'I value D&T because....'.

During this iterative process repeating ideas were moved as the original data revealed that the repeating idea misrepresented the original intention. For example one category value initially had four repeating ideas with a summative sentence: I believe D&T is of value because it combines learning through using both hands and brains. The four original ideas were:

1. learning through using brains and hands
2. fuses design technology, practical skills and theory
3. engages pupils in different ways of learning
4. application and development of specific knowledge and skills

But looking back to the original text led to points two and three moving to a different category and point four being rephrased as 'combine both intellectual and practical skills'.

Each final summative sentence was reduced to a value statement and twenty-two value statements were the final outcome of this lengthy process creating the following values series:

1. Meaningful activity of solving real problems with real solutions
2. Learning happens through using brains and hands together
3. Empowers society to act to improve the world
4. Personal ownership of decisions and actions
5. Learning of vocational skills and techniques that open doors to a range of careers
6. Using raw materials to make a product

7. Designing for future needs and opportunities
8. Develops the skill of creativity
9. Freedom to take risks and experiment
10. Considers the ethics of technological development
11. Alternative to academic subjects
12. Identifying problems to be solved
13. Activity of designing
14. Helps the understanding of human beings' position and existence in the world
15. Become aware of the economic impact of technological development
16. Develops the skills of autonomy and collaboration
17. It is fun and enjoyable
18. Provides a practical purpose for other school subjects
19. Examination and questioning of the made world
20. Learn from evaluating personal success and failure
21. Contributes to the nation's industrial and economic competitiveness
22. Learn practical life skills

These axioms are in any hierarchical order but as they were discovered from the data, although I acknowledge some may appear lower down as a result of my personal judgment as to their importance.

Conclusion

Auerbach and Silverstein (2003) describe this coding method as hypothesis generation research linked to grounded theory. I am not using grounded theory methodology, only the potential this method gives me to use words from the participants rather than imposing my own words on the interpretation of the individual's values. It allows me to remain in 'contact with the empirical base' (Alvesson & Skoldberg, 2009, p. 57).

Therefore the methodology is reflexive as the different levels of interpretation interplay with each other and are acknowledged in the development of the framework. Within my research there are four levels of interpretation (see table 1). Each of these levels will, I believe, have an implication in how the final framework presented above has been developed. At this stage of my PhD journey I am still exploring my understanding of these levels but I want to explain my current thinking at this stage and how these levels could be impacting on my interpretation of the text.

Table 1: Levels of interpretation (Alvesson and Skoldberg, 2009, p.273)

<i>Aspect/level</i>	<i>Focus</i>
Interaction with empirical materials	Accounts in interviews. Observations of situations and other empirical materials
Interpretation	Underlying meanings
Critical interpretation	Ideology, power, social reproduction
Reflection on text production and language use	Own text, claims to authority, selectivity of the voices represented in the text.

The first level is interpreting the empirical material being mindful of how the data were created. The student rationales were not created only for use in this research, whereas the interview transcripts were. Also the student rationales were influenced by my earlier mentioned talk.

The second level is my interpretation as the researcher. I am not objective as I hold my own values of D&T, which could 'limit the possibilities of making certain interpretations' (Alvesson & Skoldberg, p. 273) even though I struggle to articulate my values. During the coding and values generation process I did have an affective response to some phrases used by participants to define their values of D&T. For those I had a negative response to I was conscious not to exclude them. For example I found refining value number eleven difficult as I did not want to acknowledge that for some pupils D&T provides a 'change from intense academic subjects' (words from one student). Being mindful of this after step four each individual's values from step two were cross-referenced with the final values to ensure all were included.

The third level is the critical interpretations which includes ideology, power and social reproduction. The labels I had given the two groups, students and experts reveal my relationship, and therefore the power, I ascribe to them within my interpretations. It was interesting to reflect that I used the experts repeating ideas to lead the formation of the categories at step four; is this evidence of the power I ascribe to this group of people? Earlier I placed this group as part of the Holders group but maybe I subconsciously placed them into the Shapers as part of my own interpretation of the power they have over the curriculum? Also the location where the data were created (time and physical space) could influence the values described within the text. The students wrote a rationale about D&T knowing I would read it and some of the interviews took place during a conference. All data collection took place during the curriculum upheaval mentioned earlier.

The final level is my reflection on the 'text production and language use'. The voices in this paper are all from within D&T and represent only the Holder group. Therefore the framework can only claim to represent the values held by this limited group and possibly only the representatives from these groups. For it to be more representative the values of other voices from outside the immediate D&T community need to be heard.

The study's next stage is interviewing members from the other stakeholder groups to discover their values (steps one to three of the coding process); these values will then be combined with the repeating ideas from all of the stakeholders to form the final framework (step four). This final framework will be used for stage two of the research, which is to make judgements about the profiles different stakeholders have of the subject.

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