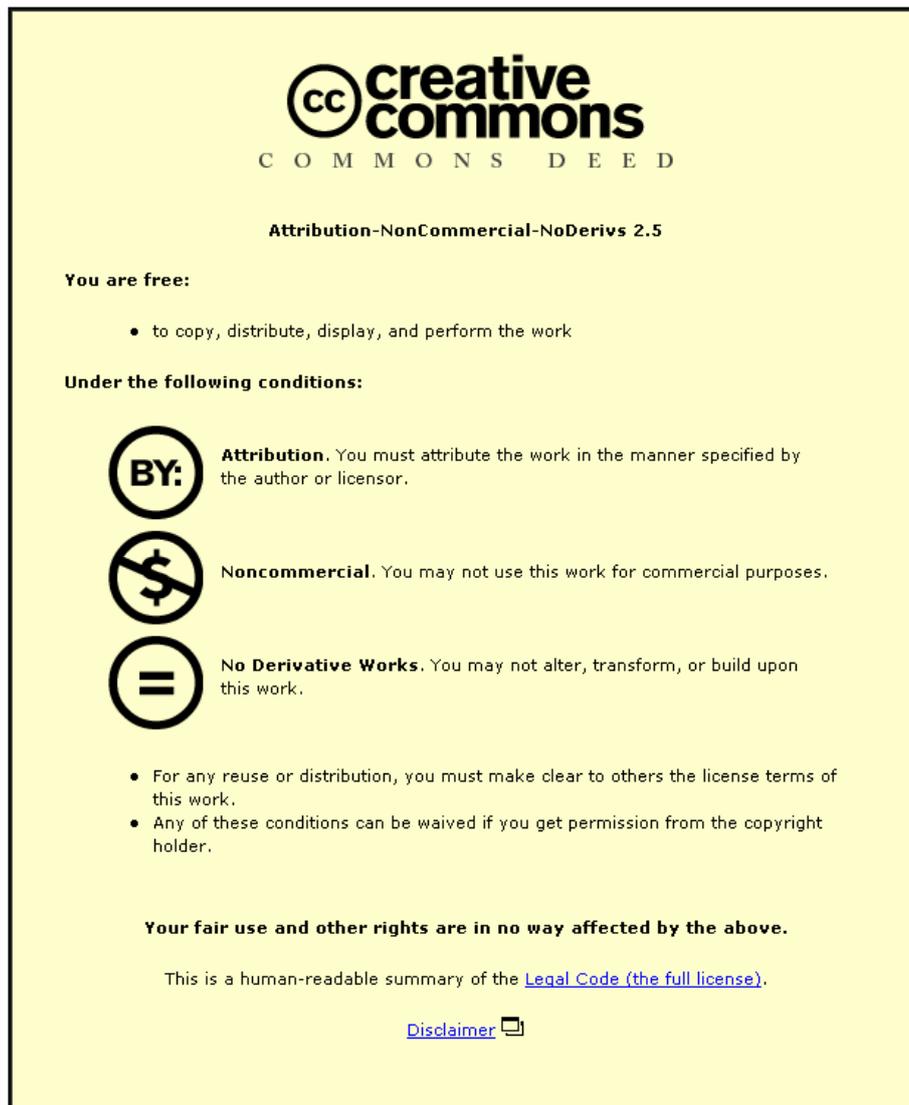


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**An investigation of the features of design and technology lessons that motivate disaffected and low ability pupils to engage in learning: an action research project focussing on perceived relevance**

**by**

**Michael Gary Thomas**

**Doctoral Thesis**

**Submitted in partial fulfilment of the requirements**

**for the award of**

**Doctor of Philosophy of Loughborough University**

**October 2007**

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## **Publications produced during this enquiry**

Thomas, M. and Denton, H. (2006) 'Exploring low ability and disaffected pupils' perceptions of the relevance of design and technology: a case study with a group of pupils aged between 14 and 16, Key Stage 4', E Norman (ed) *Design and Technology Education: and International Journal*, Trentham Books Ltd, Stoke on Trent, Volume 11.1, 145 – 58

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Thomas, M. and Denton, H. (2007) 'Factors contributing to low ability and disaffected pupils having a positive perception of the relevance of design and technology', E Norman (ed) *Design and Technology Education: and International Journal*, Trentham Books Ltd, Stoke on Trent, Volume 12.1, 47 – 54

Thomas, M. and Denton, H. (2007) Action research: A review of the research methodology used in a practitioner action research project at a South Wales comprehensive school with particular reference to interview methodology, 20/06/07 <http://idater.lboro.ac.uk//conferences>

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## **Abstract**

This thesis is based on practitioner and action research by the author. A series of iterative case studies identified factors that contributed towards a group of low ability and disaffected pupils being engaged in learning in design and technology. The findings of each case study were analysed and conclusions used to frame the subsequent case study. Findings from these case studies were then used to develop an action research project.

Discussion of the relationship between pupils' perceived relevance of an activity and their levels of engagement has appeared on the UK educational agenda, (Ofsted 2005:51-52, Davies *et al*, 2004:147, Daniels *et al* 1998:5.5, Denton, 1992), but not with the frequency which might be expected. Initial research at the school found that a group of low ability and disaffected pupils had a very positive perception of the "relevance" of design and technology. In contrast the literature reviewed suggested that pupils in their samples had a low perception of the "relevance" of design and technology.

Qualitative methodology was used. This included interviewing teachers and pupils and the development of a semi-structured interview schedule. Analysis of this data was aided by the use of a Likert, (1932) rating scale. A "summated" scale, Trochim, (2006) supported the interpretation of data. Observations were used to record classroom interactions. A Delphi group (Toffler, 1970:462) explored issues emerging during the research and to limit the danger of single observer bias.

Pupil understanding of the term "relevance" was explored. The findings identified strategies employed to promote the relevance of the subject. These strategies were developed into an action research project that tested the strategies in three other schools. One school, with a relatively inexperienced teacher, found the strategies had a positive impact on teaching and learning.

**Key words:** design and technology, relevance, low ability, disaffected, special educational needs, engagement in learning, action research, Delphi group

## Research diagram

2000 / 2001  
**Pre-research phase** reflecting on practice via an MA, learning about research in action



2002  
Loughborough University part time PhD  
**Primary research question** - What are the factors in design and technology lessons that contribute to low ability pupils being engaged in learning?  
**Pilot interviews** and interviewing techniques, Ethical considerations, Curriculum Research / Curriculum Development



2003  
**Case study 1** - What are the features of design and technology lessons that motivate disaffected and low ability pupils to engage in learning?  
**Discussion** – relating findings to literature review  
**Findings** – many factors resonated with literature – relationships, practical nature of subject, enthusiasm, use of exemplar material, the use of praise, lesson timing, scaffolding, group work  
**Focussing** – the pupils had a positive perception of the relevance of design and technology in contrast to the findings in the literature review - a dissonance with the literature  
**Case study 2** - Exploring disaffected pupils' perceptions of the relevance of design and technology: a case study with a group of pupils aged between 14 and 16, Key Stage 4  
**Findings** - The pupils subscribe to both definitions; *“relevant” connected to the present, situational; “relevant” preparation for a particular purpose.*



2004  
**Case study 3** - What factors contribute towards low ability and disaffected pupils having a positive perception of the relevance of design and technology at this school?  
**Findings** – Findings developed into a set of teaching strategies a “toolkit” that promotes the relevance of the subject  
7 July 2004 Progress Review 1 Year 2

**Background reading** – methodology, literature review of key words in the title – design and technology, motivation, disaffected, low ability pupils, engagement in learning, teaching. **Discussing research** with pupils, parents and colleagues



2005  
**Case Study 4** – Action Research: Phase 1 -  
to establish if strategies that promote the relevance of design and  
technology, identified in previous case studies at the researcher's  
school, can have an impact in different schools. Three schools  
agreed to take part in the research.



2006  
**Case Study 5** – Action Research: Phase 2 - to establish if the  
strategies that promoted relevance at the researcher's school had  
any impact at the other three schools. The teacher at school B  
was the least experienced. The strategies implemented by him at  
this school promoted the relevance of design and technology.



2006 – Publications  
*Exploring low ability and disaffected pupils' perceptions of the  
relevance of Design and Technology*  
*Ethical Practitioner Research in Design and Technology  
Education*



2007  
**Conclusions** - reflections on the methodology used, a statement  
regarding the limitations of the work, a summary of the findings, a  
summary of the contribution to knowledge and potential questions  
for future research.  
8 June 2007 Progress Review 5 Year 5



2007 – Publications  
*Factors contributing to low ability and disaffected pupils having a  
positive perception of the relevance of Design and Technology*  
*Action research: A review of the research methodology used in a  
practioner action research project*

Background reading – methodology, literature review

## **Chapter 1 - Introduction**

**Thesis – An investigation of the features of design and technology lessons that motivate disaffected and low ability pupils to engage in learning: an action research project focussing on perceived relevance**

*This chapter introduces the research and offers background to the case study work and the research questions. Also included are discussions regarding curriculum development and curriculum research, and the ethical considerations of carrying out practitioner research. The purpose of this is to develop a working understanding of these terms as used in this research.*

### **1.1 Introduction**

This thesis reports work completed as a long term action research project by the Head of design and technology in an 11 to 18 comprehensive school in Wales. This project began with a case study which had as its primary research question: *What are the features of design and technology lessons that motivate disaffected and low ability pupils to engage in learning?* (Case study 1) This appeared to show that these pupils had a positive perception of design and technology at the school. The case study identified a range of factors that contributed to the development of the pupils' positive perception of the subject. Factors such as good relationships between staff and pupils, the practical nature of the subject, the use of group work and perceived relevance. These factors were then discussed in relation to the literature reviewed. The pupils' perception of the relevance of the subject contrasted with findings in the literature. How these pupils perceived the term "relevance" was explored in the next case study, (Case study 2), reported in a published paper, (Thomas and Denton, 2006:45).

Case study 3 explored how a positive perception of "relevance" of the subject was promoted at the school. It used feedback from the pupils' perceptions gathered in the 2 previous case studies. It then added data and analysis based on observations of teaching and learning in design and technology

lessons with this group. These observations were fed into a staff Delphi group (Toffler-1970: 462) for analysis and the results fed back to the pupils for checking. A range of strategies emerged that appeared to support the development of a positive perception of the subject by the pupils. This was reported in a published paper, (Thomas and Denton, 2007:11). Finally these strategies were developed into an action research project that tested the strategies in three other schools. Results from the action research project show that one school, with a relatively inexperienced teacher, found the strategies had a positive impact on teaching and learning.

## **1.2 Background – Context**

This thesis reports work completed by the author, the Head of design and technology in an 11 to 18 comprehensive school. The school is located in an area of social deprivation and high unemployment, and supplies 37% of its pupils with free school meals, (Local Education Authority average is 22%). The catchment area has a strong community identity. The author has worked at this small, mixed, 11 to 18 comprehensive school of some 750 pupils for twenty three years, ten of which were spent as Head of Year, four as Head of Technology and the last three as Assistant Head Teacher. This length of time at the school means that a complex range of relationships with the subjects of the research has been developed. There are obvious methodological implications due to this context – bias, subjectivity, the “Hawthorn effect”, (See Cohen et al, 2000:127), and the difficulty of gaining an objective distance from events. There are also ethical implications – confidentiality, how to protect the identity of respondents in a small school setting, issues of role conflict. These methodological and ethical implications confront all researchers but because of the context and the researchers self it means that they take on a particular significance in particular circumstances.

### **Genesis**

Curriculum and staffing constraints conspired to create a distinctive group in design and technology for low ability and disaffected pupils: a “sink” group.

The group consisted of a maximum of 16 pupils, 70% of these being boys. The pupils were in the bottom set for all subjects and had “discrete” extra lessons in English and Maths. All the pupils had been temporarily excluded from school for fixed periods of time during the last 2 years. Details of a “sink” group are given in appendix 1.1. The reasons for exclusion have been varied but follow a general theme of wanting to challenge the school’s authority – verbal abuse of staff, failure to comply with the school uniform code, deliberately ignoring instructions given by Senior Management and teachers. A number of staff refused to teach the pupils either individually or in combination. They are “a very disruptive element which handicaps the rest of the group from making appropriate progress.” (Quote from science teacher)

Analysis of GCSE results over a three-year period identified that this group were gaining their best results in design and technology. Ipsitive analysis, comparing the same pupils’ results in different subjects, showed an average of +2.0 for the period. The pupils produced work as good as, if not better than, less problematic pupils in the year group, yet still continued to be disruptive and disaffected in other lessons. The Head of design and technology sought to identify factors that contributed to the pupils positive response to design and technology. Would these factors be related to the nature of the subject, the nature of the teacher, the nature of the pupils, the reduction in class size or a combination of a variety of factors?

These questions developed into a set of aims:

- To analyse the teaching and learning experiences of this particular group of pupils in design and technology
- To develop a more appropriate and effective course in design and technology to address the needs of this group of pupils

### **1.3 Primary question investigated:**

What are the factors in design and technology lessons that contribute to low ability pupils being engaged in learning?

### **Secondary questions investigated, questions that emerged as the enquiry unfolded:**

#### **Case study 1**

What features do staff perceive as being significant in the process of motivating disaffected and low ability pupils to engage in learning in design and technology lessons at this school?

What are the pupils' perception of design and technology at this school?

#### **Case study 2**

How do pupils at this school understand the word relevant?

Which interpretation do the pupils favour?

As a result of these interpretations and understandings, what subjects do the pupils perceive as being relevant?

#### **Case study 3**

What factors can be identified in design and technology classroom practice that contribute towards pupils having a positive perception of the relevance of design and technology at this school?

What factors can be identified in departmental documentation; policies, development plans and schemes of work that contribute towards pupils having a positive perception of the relevance of design and technology at this school?

**Case study 4 – the action research phase - Research questions, phase 1, before implementing strategies intended to promote the relevance of Design and technology**

What perceptions of the term “relevance” did the pupils at the 3 schools have?

How did these perceptions compare with those of the pupils at the researcher’s school?

How relevant was design and technology perceived by the sample pupils in these three schools before the strategies were implemented?

How did the staff at the three schools perceive their groups of low ability and disaffected pupils in terms of: ability, attendance, motivation, ability to remain on task, behaviour and quality of teacher pupil relationships?

What were the perceptions of the staff at the three schools regarding the pupils’ ability to engage in learning in design and technology?

What were the observations of the staff at the three schools regarding how relevant design and technology was perceived by: senior management, other staff, pupils, parents and the community?

What strategies did the staff at the three schools use to promote the relevance of the subject?

**Case study 5 - Research questions, phase 2, after implementing strategies that promote the relevance of design and technology**

How relevant was design and technology perceived by the pupils in these three schools after the strategies were implemented?

Had staff attitudes toward the focus group changed?

Had there been any change in the perceptions of the staff at the three schools regarding the pupils' ability to engage in learning in design and technology?

Had the perceptions of the staff at the three schools regarding the relevance of design and technology changed?

Which strategies, if any, did the staff at the three schools feel most effective in promoting the relevance of the subject?

### **1.5 Curriculum Development /Curriculum Research**

This section will examine the meanings of the terms "Curriculum", "Research" and "Development". The terms are all open to interpretation. The aim in this section is to establish a working understanding of the terms as used in this project.

The term "curriculum" is problematic and open to a range of interpretations. Cohen et al, (2000:32) uses Tyler's, (1949) rationale. This positivist tradition views curriculum as being controlled and controllable, ordered and predetermined. This resonates with those who see ideology and power as unproblematic. This contrasts with a post-modernist view of the curriculum as being problematic and fluid, (Doll, 1993). Not all knowledge can be included in the curriculum. Cohen et al, (2000:33) comment that the curriculum is a selection of what is "deemed to be worthwhile knowledge. The justification for that selection reveals the ideologies and power in decision making in society." Habermas, (1972), develops the principle that knowledge and its selection are neither neutral nor innocent. If the curriculum is based on the selection of certain types of knowledge then the next question must be *whose* knowledge? What and whose interests does that knowledge serve?

Any response to these questions will be related to the standpoint one adopts as to what the outcomes of education are – social control / social engineering, and what the primary purpose of education is. Dale, (1986:87) identifies the two ends of a complex continuum "to serve the national interest or to serve the

interests of the pupils.” Curriculum can be interpreted broadly as: “Encompassing the experiences of everyone in the institution. Curriculum does not just refer to the written intentions of teachers, but to the sum of all the messages sent and received” (Potts and Armstrong 1995:78). This definition includes the issue of pedagogy - “the interactions between teachers, students, the learning environment and learning tasks” (Murphy, 1996:48).

Stenhouse’s, (1975:142) definition, whilst acknowledging the breadth of the topic, introduces an element of measurement: “I have identified curriculum as a particular form of specification about the practice of teaching and not as a package of materials or a syllabus...It is a way of translating any educational idea into a hypothesis testable in practice”. Stenhouse is closely associated with the teacher as researcher movement. Curriculum, in this research, will be defined as a combination of Potts and Armstrong’s encompassing definition, and the focussed “testable” aspect defined by Stenhouse above.

Curriculum development is defined by Skilbeck, (1982:180) as: “In talking about curriculum development in any form we must give our main attention to plans, designs and ideas for action: our theory is a theory of action....the planning, design, implementation and evaluation of a programme of student learning”. This definition resonates with School Teachers Conditions of Service Document, (2000:80-88). Paragraph 51.5 relates the headteacher’s duty to: “Determine, organise and implement an appropriate curriculum” and paragraph 51.6 “To review the work and organisation of the school”. Whilst paragraphs 58.1 – 58.6 of the teachers’ duties include such conditions as: “Planning and preparing courses....reviewing methods of teaching and programmes of work....advising and cooperating with the Headteacher on the preparation and development of courses of study...teaching methods”.

It is arguable that Skilbeck’s, (1982:181), definition of curriculum development is a part of the teachers’ conditions of service. It is not about what good teachers do, it is about what all teachers must do. It is inevitable that the amount of contribution that teachers make towards curriculum development varies considerably. Some teachers may not be in a position to participate in

planning and preparing courses and evaluating their outcomes. Reasons for this could range from inexperience, management policy to total lack of interest. Many teachers may be unaware that they have been contributing towards curriculum development. Subtle changes in pedagogy – a slight change of emphasis, even a change of classroom – could all contribute towards a curriculum “development”. Contractually, however, it is not an optional activity. What then distinguishes curriculum development from curriculum research?

Research does not have a shared meaning. It can be used to cover a wide range of activities and approaches. Cohen et al (2000:5), identify three characteristics common to all forms of research:

“Research is systematic....empirical... and self correcting – open to scrutiny”.

Not all teachers are capable of, or committed to carrying out, curriculum research. Stenhouse, (1975:144) distinguishes between the *restricted* and *extended professional*, drawing on the work of Hoyle, (1972). The extended professional has, according to Stenhouse, (1975:144), the following characteristics:

- *The commitment to systematic questioning of one’s own teaching as a basis for development*
- *The commitment and skills to study one’s own teaching*
- *The concern to question and to test theory in practice by the use of those skills*
- *A readiness to allow other teachers to observe one’s work.... and to discuss it with them on an open and honest basis*

These characteristics feed into a form of research labelled as “action research”. Curriculum development happens. At one level it could be described as concerted effort at a national level to develop an aspect of the curriculum, eg. Pro/ DESKTOP. At another level it could be described as a subconscious activity; the individual teacher making subtle subconscious changes.

Curriculum research, however, needs to be “systematic....empirical... and self correcting”. It should be pointed like a microscope to look at curriculum developments not just to measure and evaluate the success of their outcomes, but also to question every aspect – Why? What? How? - from conception to maturation to obsolescence.

## **1.6 Ethical considerations**

### **Introduction**

Much classroom practice has advanced on the basis of practitioner research. Such research is ultimately about improving teaching and learning. However, it has the potential to harm the subjects of the study; the pupils themselves and fellow colleagues. Practitioner researchers, therefore, need a strong grasp of the ethical as well as methodological issues involved in such work.

Practitioner research is normally of small scale and focuses on the immediate role of the practitioner. The research may be passive, such as a survey, or it may be active. The latter is often defined as action research and follows Cohen and Manion’s (1994:186) definition of “a small-scale intervention in the functioning of the real world and a close examination of the effects of such an intervention”.

### **Background to the ethical debate**

Any research in a social context should be based on sound ethical principles. These principles are interrelated and are inevitably tied to the researcher’s perception of their world and their construction of what they constitute as knowledge. Dockrell, (1988:180) noted that most books on educational research published in the 1970s (Butcher and Pont 1973; Kerlinger 1973; Taylor 1973), not only do not include a chapter or section on ethics but do not even include the term in their indexes. This is not to say that the ethical debate did not exist before the 1970s. Hargreaves (1967:193 -205) raised several ethical issues in his discussion of role conflict. However, it serves to illustrate the shift in ethical emphasis to more centre stage. Kemmis (1988) and

Whitehead (1993) regard action research as being an ethical enquiry; Radnor (2002:34) describes interpretive research as “ethics in action: dignity and respect for participants”.

This new emphasis reflects the shift from seeing participants, in this case pupils, as samples or representatives of the population to seeing participants as individuals. It can be argued that this “dignity and respect for participants”, (ibid), is a factor in assessing the accuracy of the data collected. Lincoln and Guba, (1985) believe that a standard for qualitative research, where events and the perspectives of those being studied have to be reconstructed, is the demonstration that the researcher’s findings and interpretations are credible to the participants. The act of research in this form becomes a dialogue between researchers and researched.

The British Educational Research Association (BERA 1992) provides a set of ethical guidelines to support the researcher in an educational setting. Ethical committees and guidelines are also, usually provided by universities. In this case the Loughborough University guidelines last revised in 2003 were used. The guidelines provide a very clear framework and check list that can raise the awareness of the researcher as to what may lay ahead.

### **Ethics and the researcher’s professional role**

White (1973:223-237), argues in her exploration of the relationship between “Education, democracy and the Public Interest” that education is central to democracy. She continues the argument as to what might constitute an “appropriate education” and who determines it. Public interest policies like education are about things that the public “**ought**” to have, (White’s emphasis) and are therefore based on value judgements. The development of educational policy and the curriculum are intrinsically connected to this ethical debate.

A cursory analysis of the UK “School Teachers’ Pay and Conditions Document 2000” reveals a list of professional duties that relate to issues that affect the

quality of existence of pupils, governors, parents and fellow professionals. These duties include formulating and implementing policies that range from the curriculum, to pastoral care, discipline, relationships with staff and with parents, (See DFES 2000:77 –83). Keirl (1998) asserts that anyone who has an interest in the quality of our existence is faced with ethical questions and therefore involved in some degree with an ethical discourse. The study of ethical issues inevitably leads to the discussion of associated terms such as right and wrong, obligation and values. Slote, (1995:591-595) argues that a major problem of moral philosophy is the development of a rationally defensible theory of what constitutes right and wrong action. Singer (1993:204) rejects this notion of theory and comments that: “Ethics is practical, or it is not really ethical.”

Keirl, (1998) discusses the issue of ethics in relation to design and technology education. He considers the question of technology curriculum design and describes it in terms of competing variables. These variables include issues about what should be taught, and how. Any response to address these issues requires ethical reflection and action. It remains incontestable that there will always be a debate about what is meant by “good design and technology education. “Ethics”, “design” and “technology” all have in common that they are contestable, non-neutral terms open to interpretation. Keirl concludes, (1998:221) that the practise of ethics and the ethics of practice in technology education constitute a complex issue, central to the concerns of educators and society alike.

### **Before beginning the research**

It is clearly essential to have permission from the Headteacher and governors to carry out research at their school and to gain that approval before any research has taken place, (See section E: Loughborough 2003, and clause 7, BERA 1992). A vital factor in gaining consent is the nature of the research itself. Is the aim and purpose of the research clearly conveyed to this audience? What reassurances can be offered regarding use of time,

resources, and confidentiality? What does the school stand to gain? Who should be included in this audience?

The matter should be discussed with the Headteacher and a statement made at a staff meeting to raise awareness. The ideas of the research project could be outlined at parents' evenings with individual parents. An appropriately worded outline of the research and its implications could be used as a basis for the discussions. If parents of the target group were unable to attend the research outline could be sent home to them with an invitation to contact the researcher at the school for further details. The pupils could be included in these preliminary discussions. This inclusive approach has to be balanced against the methodological implications of sensitising the participants. Sensitisation via informing parents and children could reduce the reliability and validity of any data.

Teacher practitioner research can be viewed as an extension of professional practice: reflecting rigorously on teaching and learning with the aim of becoming a more effective teacher. Evaluating and reviewing is enshrined in the School Teachers Conditions of Service Document, (2000:80-88): "Planning and preparing courses....reviewing methods of teaching and programmes of work....advising and cooperating with the Headteacher on the preparation and development of courses of study...teaching methods", (para. 58.1 – 58).

Sharing ethical concerns with all stakeholders during the course of 'normal' professional reflection and curriculum development is rarely considered. Where to draw the line between these activities and "research" is itself an ethical decision. A decision further complicated by communication and language problems due to the diversity of the audience. Is it possible for all participants to have a common understanding of the aims of the research? A parent could withdraw a child from a group because they misunderstand the nature of the research. A pupil could object to an interview transcript being used or the meaning the researcher draws from it. A means of overcoming this problem is to have a simple set of objectives. The language and terminology

must be understandable to all the participants in the research at the school. There may also be potential benefit for all parties in allowing the research to go ahead. For example, to identify teaching strategies so that learning for the pupils might be more effective.

The researcher should present the methodology used in detail and include how the various parties have been briefed on the research. This should enable the reader to be clear as to potential sensitisation and be in a better position to make his or her own judgement as to the validity of the work.

“Reasonableness” must be applied. There is a danger that the pursuit of ethical purity could prevent any potentially valuable research from taking place.

### **Potential for bias – objectivity / subjectivity**

Burgess (1989:68) argues that the researcher might be tempted “not to tell all”. Practitioner / researchers must also guard against telling it as they think it is, or seeing what they expect to see. Extreme circumstances may arise. How might they react to an act of professional misconduct by a colleague? Griffiths (1985:210) reflects on this ethical dilemma that could be particularly acute amongst teacher researchers; how could the research affect “the delicate credibility structures amongst one’s colleagues”?

As a practitioner / researcher the author has a role within the school that sets serious time and movement constraints on his availability to carry out the research. This may give rise to the temptation to see his “snap shots” of a situation as being wholly accurate. Torrence (1989:177) warns that this may be exposing routine practice to potentially unfair criticism. Taking a subjectivist approach to the research would seem an inevitable perspective to adopt. Historically this perspective may have been problematic but it would appear that the subjectivist approach has gained an acceptable level of respectability. Indeed, Glesne and Peshkin (1992:104) consider that: “The subjectivity that originally I had taken as an affliction... could be .. taken as virtuous...My subjectivity is the basis for the story that I am able to tell. It is a strength on which I build ”.

Is recognition of these perspectives sufficient or are there other checks and balances that can help the researcher guard against the potential ethical problems associated with bias? Yes, firstly, Fraser, (1997:2) argues that “practitioner” researcher has a professional obligation to the subjects of the research; in this case a professional responsibility to pupils, parents and staff. Secondly, the research is being supervised externally and aspects published as the work proceeds; a biased line of reasoning can be identified and challenged by supervisors and peer review. Thirdly, respondent validation will help guard against the researcher’s own personal bias predominating. Transparency also supports research methodology: the reader is given all the information necessary to help them make judgements on the data and conclusions drawn from the research. Figure 1a is a simple diagram of an ethical research plan. The plan emphasises the need for renegotiation based on feedback from the participants in the research

### **The subjects of the research – the staff and pupils**

The BERA ethical guidelines (1992:1) have five points on ethical considerations relating in particular to the participants of the research. They are summarised below:

- Participants in a research study have the right to be informed about the aims, purposes and likely publications of findings....the potential consequences
- Care should be taken interviewing children...permission should be obtained
- Honesty and openness should characterise the relationships
- Participants have the right to withdraw
- Researchers have a responsibility to be mindful of cultural, religious, gender differences

The BERA ethical guidelines, (1992) appear fairly mechanical to execute. However, issues such as the participants right to withdraw are far more problematic for the teacher researcher. Such researchers have an obvious existing relationship with the subjects of the research. They cannot reconstruct these relationships; they are already firmly established. Pring (1984:10) adds the factor of re-negotiation. It is not sufficient to negotiate aims and purposes at the outset, as it is possible that these will shift as the project evolves. The researcher must develop a process of feeding back data and sharing findings with the participants. This supports the research principle of data checking. However, this action carries with it the problems of participants being over sensitised and the “Hawthorn effect”, (Cohen et al, 2000: 303)..

This quality of relationship will be a factor in collecting data but it can also be perceived as part of the wider debate regarding the goal of educational inquiry. Bird *et al*, (1996:90) comment on the changing conceptions of qualitative research; can evidence be independent of the presupposition of the researcher? To what extent can educational enquiry produce accurate representations of educational processes? This line of reasoning develops into the distinction between the use of fictional and factual rhetorical forms in accounts. An interview account is a version of events as the interviewee and interviewer perceives them. It could well be that the themes of the stories being told are more significant than the accuracy of the language of the account. Walker (1978:147) poses a set of searching questions at the beginning of his article, “On the use of fiction in educational research”: Can the quest for objectivity distract us from the pursuit of truth? Is fiction the only route to some kinds of truth?” Hammersley, (1995, chapter 1) argues that accounts produced by researchers are accounts that reflect their personal characteristics and socio-historical circumstances.

## **Confidentiality, anonymity and withdrawal**

BERA point 13, and section G: Loughborough, 2003, both highlight the issue of anonymity and confidentiality. Researchers use several strategies to address the issue of confidentiality: the use of fictitious names, as in “Hightown Grammar”, (Lacey, 1970), or as Richardson (1973), did in her “Nailsea” study, negotiate with all the subjects before the report was published. Radnor, (2002:35) discusses the ethical approach of a PhD student undertaking an interpretive study. The student summarises her consideration of ethical issues as a means “to protect her respondents”.

“Respondents received different names, any information was deleted if it was so personal as to lead to respondent identification”.

Each of these anonymity strategies has their merits. It is likely that they will be combined – negotiated with the participants and given false names. The question was how could this be achieved in the setting of the practitioner / researcher in this case – a small comprehensive school, a small group of identifiable pupils, and staff who are recognised by their academic subjects? It would be difficult for people external to the school to crack the anonymity codes, but those subjects could still be traced. The issue here becomes one of “reasonableness”. Has the researcher taken all reasonable steps to protect the participants?

Whichever strategy, or combination of strategies, are used, the subject should still maintain the right to read their material before the account is published. This raises three further questions: To what extent should the subject have the right to remove material to which they object? What constitutes material – transcripts of verbatim interviews and observations, or, interpretations of the transcripts? What is the relationship between the rights of the subjects and the rights of the community for whose benefit the study was executed? This particular action research focuses on low ability and disaffected pupils and, therefore, raises further questions. How does the researcher make the material of his / her research meaningful to the breadth of potential audience?

The methodology of interpretive action research can involve the subjects very closely in the construction of data. It is anticipated that the preliminary dialogue with participants would outline the potential benefits of the research. This would help give a wider perspective to problems created in the third question discussed above but also increase the potential to further sensitise the participants.

However, what if the participant disagrees strongly? The ultimate action would be for the participant to withdraw. Both the Loughborough and BERA ethical guidelines, (See section F: Loughborough, 2003, and clause 10, BERA, 1992) underline the participant's right to withdraw. The right to withdraw from the study also has broader implications for a teacher/researcher. Can a pupil request to opt out of the project or even leave the class under observation? Requests to opt out would be very difficult for the teacher/researcher and for the school to manage. If the child remained in the class they would have an influence on the class but their specific influence could not be recorded. Yet, removal from the group could create a different set of problems for the research by altering the composition of the group as a whole. This issue has implications for the viability of the research.

Discussing the implications of carrying out the research at the outset with all participants should help to avoid this situation. A different group of pupils could be selected at the start if the researcher had doubts. If a pupil requested to opt out from a class under observation the researcher would need to examine his / her methodology. Woods, (1996:83) describes researchers who adopt a qualitative approach as those who: "try not to disturb the scene and to be unobtrusive in their methods in an attempt to ensure that data and analysis closely reflect what is happening". Ideally the pupil would be made aware of the research at the outset but would be unaware of the research as it progressed. Withdrawal from the group could be for other reasons – prolonged illness, truancy or exclusion. The practitioner researcher has to work around these situations by applying skills of re-negotiation and reasonableness.

## **Role conflict**

Hargreaves (1967:194) defines role as an aspect of the total behaviour of a particular actor occupying a particular status within a social system. Role conflict occurs when expectations cannot be fulfilled. Hargreaves, (1967:199) assumes many roles during his research: as a teacher, with a role to play with other teachers and pupils, as an observer, and as a friend to the boys. He concluded that the ethical issues that developed by these roles and relationships were incapable of simple resolution.

Pring (1984:286), discusses role conflict issues – betraying trust, taking or not taking action that is expected of you. As a senior manager, during the course of every day teaching duties, the primary author finds himself in positions where decisions as to who to support are ethically difficult to make – the wronged child or the failing teacher? Nevertheless, decisions are made and are made on the spot as a result of his / her own judgement of the situation. How are these decisions arrived at?

Carr (1987:163-75) discusses the question – “What is an educational practice?” Part of his article illuminates the Aristotelean concept of “phronesis”, the ability to identify the particularities of a situation in the light of their ethical significance and to act consistently on this basis. It is not the judgement of an umpire applying a set of codified rules, but a form of wise and prudent judgement that takes into account what would be morally appropriate and fitting in a particular situation. “Phronesis” is an ability that develops through people’s life experiences by deliberating and reflecting on them: “Thus, deliberation is not a way of resolving technical problems. Rather, it is a way of resolving those moral dilemmas which occur when different ethically desirable ends entail different, and perhaps incompatible, course of action.” (Carr 1987:170).

## **Legal implications**

The discussion so far has focussed on an academic discourse. However, it is vital to be aware of the legal implications that are the consequences of legitimising the ethical debate.

The United Kingdom Data protection Act, 1998, is intended to safeguard people's rights when data about them is being collected and processed. There are eight enforceable principles of good practice that cover both facts and opinions about the individual. Enshrined in the legislation is the right of participants to know: who will process the data, what purpose is the data to serve, who will view the results of the research and comment on the outcomes. Previous to the 1998 Act these may have been perceived as ethically sound research methodology, now they are legal requirements.

The other legal landmark act that has legal implications for all who deal with children is the Children Act 1989. A key feature of the Act is "Paramountcy" – any decision made about the child has to be made in the child's best interest. Local authorities and professional associations have produced strict guidelines to support teachers, and other similar pastoral workers, to enable them to stay within the law. Confidentiality can never be promised. Any degree of confidentiality will be governed by the need to protect the child. What happens in the interview if a pupil makes an allegation against a parent, friend or member of staff? It is clear that the researcher has the legal responsibility to pass on this information and for action to be taken which lies far beyond the remit of the research.

There are also similar guidelines produced to guard against teachers getting themselves into potentially compromising situations and having allegations made against them. The whole issue of one to one interviewing needs to be evaluated thoroughly and the professional, as well as ethical, risks weighed up very carefully.

The process of open discussion focussed the researcher on the following questions: Why were a group of pupils achieving, on average, a GCSE grade in design and technology that was 2 grades better than their other GCSE grades? If factors could be identified could they be applied to raise standards of achievement in other contexts? This line of questioning locates the research in the area of school improvement: research that could be of benefit to all the stakeholders – pupils, staff, governors and parents. The author experienced no difficulty in gaining formal consent from these stakeholders. Consent and support from the stakeholders is essential if a longitudinal study over 5 years is to be sustained.

The research questions were also key factor in being able to share the research with the broad range of audiences. Communicating with staff and governors was not problematic. However, communicating the aims of the research with low ability pupils and their parents could have been problematic if the research was not perceived as being of direct benefit. Parents' evenings were used to discuss the research with parents. The parents were targeted and additional contact made with them to invite them to attend. A number of parents would have had poor literacy skills. To give them a written rationale may have alienated them from the start. They were presented with a simple verbal statement:

*“ Over the last few years children who have taken this subject have had good GCSE results. I am trying to find out why this happens. When \_\_\_\_\_ takes this subject I will want to look at her/his work closely and ask what she/ he likes or doesn't like about the subject. I will want her/him to be very honest with me. I might want to write down some of the things she/he tells me but I won't go and tell the other teacher about what she/he says and I won't write down that she/he said it. All this will happen in a normal lesson. I won't let this finding out stuff get in the way of a normal lesson and if she/he tells you that she/he is not happy about something then you must phone me so that we can sort it out. If you want to ask any questions about this then I'll try my best to answer them”*

This statement has been the standard during the research. No parent has ever said no, or asked further questions, no pupil has ever withdrawn. Is this to do with the clarity of the communication or with the imbalance of power that can exist between teachers and parents in these contexts? There is much to reflect on. The attempt to communicate simply the aims of the research is sincere; the quality of the relationship between parent and teacher is unbalanced. The parent is placed in a position where it is difficult to say no. Can confidentiality, anonymity and withdrawal be genuinely offered in the context of a small school? A concern emerges that in attempting to follow ethical guidelines unethical situations arise. "Reasonableness" must be applied or no research could take place.

Dealing with ethical problems as the research is being carried out brings additional situations that are potentially more problematic because of their immediacy, visibility and realness. Classroom observation is now widely used as a management tool in schools. However, observing a lesson for the purpose of research unearths more complex ethical situations. If the lesson goes wrong when does the manager intervene and when does the researcher intervene? Clearly the manager can intervene at once. The very presence of the "manager" can have a direct impact on the teacher classroom management. As a researcher there is a desire not to influence the setting. Perhaps the lesson that goes wrong may yield more useful data than the lesson that is effectively delivered. As a senior manager in a school and a researcher there is obvious role conflict.

What does the researcher do with the data collected – the interview transcripts and lesson observation notes? Anonymity and confidentiality have been promised but what occurs when the data uncovers: a child protection issue, an act of professional misconduct, a teacher victimising a group of pupils, lessons not planned, work not marked or a pupil who has given up? Child protection issues and acts of professional misconduct have defined responses that are legal obligations. Poor lesson preparation or pupils not working in a lesson are situations where when and how to intervene are less defined. Both situations pose a similar dilemma that could be based on a continuum.

## Conclusion

Teachers researching practice in their own school have a wide range of ethical issues to consider before the research begins and will become aware of additional ethical issues as the research continues. Fraser (1997:4), as a practitioner researcher, writes about her own ethical dilemmas: “In all of these instances there could not have been a planned theoretical response to the dilemmas, instead I needed to continually reflect upon my research and attempt to consider the consequences of whichever action I might take”.

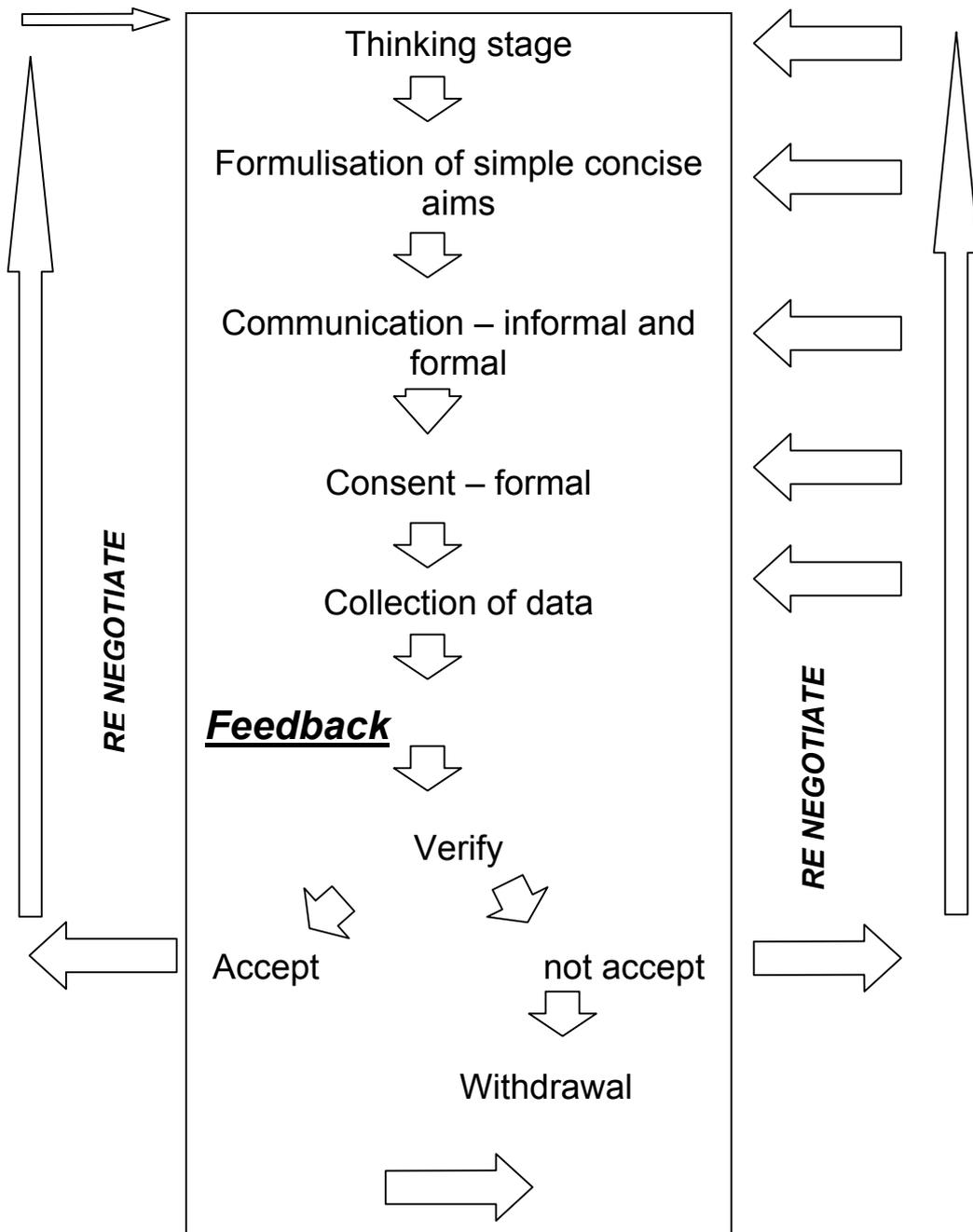
The shift in emphasis from seeing participants as samples or representatives of the population to seeing participants as subjects and the provision of legal frameworks, such as the Children Act 1989 and The Data Protection Act 1998, have undoubtedly moved the ethical debate to centre stage. Radnor (2002:34) believes that her model of interpretive research *should* be “ethics in action: dignity and respect for participants”. Add to this model the legal implications and perhaps it would be fair to say that research *must* be “ethics in action”.

In this case the practitioner/researcher has developed an ethical checklist and research plan based on the various guidelines and discussion above, (see Table 1a, Figure 1b). This was then used in planning the specific sections of research. This checklist will also act as a quality control / quality assurance measure throughout the research. The checklist must be seen as an active document and will be continually upgraded on the basis of on-going professional reflection during the practice of the author’s action research project.

**Table 1a. Ethical checklist for practitioner research in schools**

	<b>Before the research begins:</b>	
		<b>Done?</b>
1.	Raise awareness of ethical issues – background reading – legal implications – The Data protection Act, 1998, Children Act 1989	
2.	Think through the aims of your research – What do you hope to achieve? What does the school stand to gain? Can the aims of your research be clearly communicated to a range of audiences – staff / pupils / parents?	
3	Be open, talk through the plans for your research – discuss plans with colleagues	
4.	Gain formal permission from head teacher and governors – to interview children / staff / parents, administer questionnaires	
5.	Prepare simple written research outlines for the various audiences – give the aims of the research, the possible outcomes, possible publication of findings. Dispatch	
6.	Communicate aims of the research with pupils, offer confidentiality as far as possible (child protection issues), offer the right to withdraw as far as possible, apply “reasonableness” to both – guard against over sensitising	
	<b>During the research</b>	
7.	Be aware of your professional obligation as a teacher to your pupils – mindful of gender / ethnic implications	
8.	Be aware of the possible implications of one to one interviewing of pupils, using electronic recording equipment to carry out observations or interviews	
9.	Be aware of your own perspective on subjectivity. Temper your research using a Delphi group / your research supervisor to read over your work. Use respondent validation – feed back, to validate data collected	
10.	Be prepared to make changes as a result of feedback. Maintain a dialogue with all participants; be mindful of the conflict between their perspectives and the aims of the research.	
11.	Be prepared to renegotiate due to change in direction of research as the research develops	
12.	Reflect on all your work as it grows and consider the consequences of what ever action you decide to take	

Figure 1b. Diagram of ethical research plan



## **Chapter 2 - Methodology**

*This chapter details the methodology employed in this research. The chapter is made up of 4 parts: Part 1 - an overview of the qualitative nature of the research; Part 2 – interviewing methodology; Part 3 – observation methodology; Part 4 – describes the methodology used in developing the literature review*

### **Methodology Overview**

Undertaking qualitative action research as a practitioner researcher, a methodology was developed that considered a range of issues: present theoretical assumptions; professional responsibilities and time constraints; and the nature of the target group. In this section the following issues are discussed:

- Action research
- Qualitative and quantitative approaches to research
- Validity and relevance
- Myself as the main research instrument
- The teacher or practitioner researcher
- Case Study
- Bias
- Triangulation
- Interview
- Observation

### **2.1 Action Research**

Kemmis, (1988:42), describes action research as a form of research carried out by practitioners into their own practice. It is a self-reflective enquiry undertaken by participants in order to improve the rationality, understanding and the situations in which the practices are carried out. This resonates with

Archer's, (1992:12-13) model of action research; the teacher questioning his or her teaching to improve the quality of that teaching. It could be contended that many teachers are engaged in action research. However, as established in an earlier section *Curriculum Development / Curriculum Research*, there are important distinctions: "Research is systematic, empirical and self correcting – open to scrutiny", (Cohen et al 2000:5).

Kurt Lewin, (1952:564), is credited with coining the phrase "Action Research" in 1944. He described the process in terms of method as a self-reflective spiral of cycles of planning, fact-finding and execution. Contemporary action researchers have tempered and refined these characteristics so that participation is now a central principle within the process.

There are various ways of conceptualising action research. Much of the methodology is shared; the differences that emerge are those of emphasis. Kemmis, (1982:15) realised the relationship between action research and political objectives: "*Action researchers are engaged in a selection of strategies, the resolution of tactical questions, and the conduct of political struggle*".

A key aim of this research was to improve practice through critical self-reflection. The researcher aligned himself with Kemmis', (1988:42), understanding of practice as "praxis – informed, committed action". Those who observe a "praxis" have a set of values and interests of their own. The notion of value free, objective social science is illusory, as human praxis will always embody values and interests. The aim of the researcher practitioner working in a self-critical reflective way is to interpret the action and to identify previously unrecognised distortions - assumptions of habit and custom. The information gathered is interpreted through language; language itself is a social praxis subject to influence by values and interests.

Evaluation of action research involved analysis of the discourse at each of these levels. The method of action research is distinguished by the notion of self-reflection – a spiral of cycles of planning, acting, observing, and reflecting.

Rigour is derived from the logical coherence of these interpretations through reflection, the logical coherence of justifications of proposed action and the appropriate mechanisms designed to guard against bias. This model of action research is high on the educational agenda, both in terms of classroom management and whole school management. Schools are encouraged to develop skills of self-reflection, planning and acting that is almost identical to Hopkins', (1985:55), model of action research. Using this approach practitioner research can be described as an extension of professional practice.

## **2.2 Qualitative and quantitative approaches to research**

*“The assumption that what we know is a direct reflection of what we can perceive in the physical world has largely disappeared. In its place is a view that most knowledge is an interpretation of experience.” Resnick, (1991:1)*

Educational research can take many forms and serve different purposes. Sometimes it is located within social science disciplines, other work is more policy orientated, and some can be closely linked to educational practice. A common way to conceptualise this diversity in methodology is the distinction between qualitative and quantitative approaches to educational research. Quantification means to measure on some numerical basis. Quantitative research has developed from physical science traditions. The logic of this type of research is based on the assumption that causes can be identified by physical and/or statistical manipulation of variables. In the author's experience school life does not consist of simple mechanical cause and effect relationships. These social relationships are complex and contextually variable.

A qualitative approach, by contrast, emphasises meanings and experiences. This is a very simplistic definition as there are diverse forms of both kinds of approaches. Quantified data can be used to represent qualitative factors. A sensory test graph or table can be a quantitative representation of qualitative data. The researcher's position as a practitioner researcher limited the potential *to measure on some numerical basis* to his own setting. Atkinson, (1995:38)

for example, used a sample from eight schools that involved 112 pupils. Correctly designed research ensured that the quantitative data was viable. To have made the resulting data in the context of this research statistically meaningful a large number of people would need to be tested and the sample cross checked to ensure that it was representative. This would have posed an operational problem in the context of this research.

Hammersley, (1993:2) identifies qualitative research as being more concerned with process than outcomes. Qualitative research could deal better with local circumstances and could be more attuned to the distinctive character of human social life. Bird et al, (1996:16) further describe qualitative methodology in terms of a methodology that would fit these circumstances as a practitioner researcher: *“Exploring phenomena – not testing hypothesis, more open ended and less structured. Typically involving a small number of cases which are investigated in detail, the analysis of results relies on interpretation of meanings”*. Qualitative methods are especially suited to research and evaluation in education, particularly where the *raison d`etre* of the enquiry is understanding. Erickson, (1990:98) uses the analogy of researching a billiard ball’s movement and how it would compare to researching a human actor: *“The billiard ball does not make sense of its environment. But the human actor in society does and different humans make sense differently. They impute symbolic meaning to others actions and take their own actions in accord with the meaning interpretations they have made”*.

The qualitative researcher uses a range of research traditions to support interpretation of events and to create meaning. Max Weber (1864 – 1920) - the social theory of action, *Verstehen*; George Herbert Mead (1863- 1931) - symbolic interactionism and Alfred Schutz, (1899-1959) - sociological phenomenology. These tenets can be identified in the work of Hargreaves, (1967), Lacey, (1977), and in Hammersley’s work on patterns of classroom interaction, (see Hammersley, 1974,1976 and 1977). These writers share a common theme - the classroom as a site of actual or potential conflict where participants strategically interact. This theme resonated with the researcher’s model of educational research.

These concepts are bound up with the philosophical study of what is meant by “understanding” and the role of language. The philosopher Heidegger, (1889 – 1976), developed a new meaning to the study of “understanding”. Radnor (2001:12) describes his position: “Understanding is a mode of being rather than a mode of knowledge”. To understand we need to have a language to share with others, to communicate and to make sense of social action. The act of communication rests on a shared perception of the concepts that we are communicating.

### **2.3 Validity, reliability and relevance**

In a research context, validity means that the data that contributes to the explanation of an event can be sustained and would be applicable in other, similar, circumstances. Validity must adhere to the research paradigm that is being employed. In quantitative research these would be embodied in concepts such as controllability, replicability or predictability. Qualitative research has several underlying principles identified by Lincoln and Guba, (1985) and Bogdan and Bilken, (1992). These include: *context boundedness, thick description, socially situated and descriptive data, and the importance of respondent validation*. In qualitative research the subjectivity of the respondents, their attitudes and perspectives contribute to a certain degree of bias. The manifold and dynamic variables mean that every context is unique and unrepeatable – even with the same players. There are various measures by which the issue of validity in qualitative research can be addressed and are discussed by Cohen et al, (2000:106 - 9) LeCompte and Preissle, (1993:323-4) and Lincoln and Guba, (1985:219-301). Bird *et al*, (1996:32) describe validity as “truth”: the extent to which an account accurately represents that to which it refers. Gronlund, (1981) suggests that in qualitative research validity should be seen as a matter of degree rather than an absolute. The accounts gathered in the course of this research are the researcher’s representation of reality rather than his reproduction.

Maxwell, (1992) argues for five kinds of validity in qualitative research. Three were prominent during the course of the research. Descriptive validity, *the factual accuracy of the account*, and interpretive validity, *the extent to which the account captures meaning*, were both attainable due to the use of the Delphi group, triangulation, (see section 2.8 and 2.9) and respondent validation. The third, generalizability, *the extent to which the account is useful in understanding other similar situations*, was achieved, to an extent, because the research helped to understand events in the other schools visited.

Research can be perceived as reliable if it demonstrates that if it were carried out in a similar context on similar respondents then similar results would be found. Reliability can be construed as consistency and replicability. The consistency and replicability associated with quantitative research is problematic to apply in this research because of the variable and changing nature of the subjects of the research. In qualitative research reliability can be regarded as a fit between what researchers record and what actually occurs in the setting that is being researched, (Cohen et al, 2000:119). Lincoln and Guba, (1985:108) construe the notion of reliability as dependability. They identify a series of checks, which include: respondent validation and triangulation, (see 2.8), and independent audits. These audits identify acceptable processes of conducting the enquiry. In this research this was achieved through the support of a tutor, peer review and the Delphi group (see 2.9).

Bird et al, (1996:32), argue that: "To be of value, research findings must not only be valid, but must also be relevant to issues of legitimate public concern". The research fell clearly into this category of relevance in terms of importance to the intended audience. The research question: *What are the factors in design and technology lessons that contribute to low ability pupils being engaged in learning?* can be addressed on many levels: personal professional educational relevance in terms of the researcher's role within the school, researching to make his / her own practice, and the practices of his / her colleagues more effective; public professional educational relevance in terms of addressing issues that are central to contemporary educational debate.

For research to be relevant its findings must add something to our knowledge of the issues to which they relate or at least corroborate what was previously suspected but not known with confidence. The literature highlighted numerous opportunities, in areas relating to the research question, where there was a dearth of academic peer reviewed research.

## **2.4 Myself as the main research instrument**

In all approaches to research, a discussion of the details of the instruments employed to collect data would be expected. Ball, (1990:171), argues that all qualitative research should be accompanied with similar details of the instruments employed – the researcher himself or herself. This practitioner researcher adopted an action research approach. The data collected was founded on the presence of the researcher. Somekh, (1995:347) suggests that action research reports are sometimes written in the first person to reflect this individuality.

The “Review of the Methodology for Hightown Grammar” begins with: “To write about one’s own methodology and the problems of doing empirical research is inevitably to make gross assumptions about one’s own theoretical orientations and even one’s biography”, Lacey, (1976:114). He continues with a brief autobiography of himself – his life experiences and the people who influenced him. Radnor, (2002:3) writes: “We interpret experiences through the filters of existing knowledge and beliefs, and this existing knowledge and these beliefs that we hold are a product of ourselves as active subjects construing meaning”. The researcher has included a brief autobiography in appendix 4.1. The purpose was to enable the reader to make judgements regarding the validity and reliability of the research.

Ball, (1990:157-71) describes the self as critical to a qualitative approach in two ways: Firstly, to engage the self in the research setting and to establish a rapport with the participants. Secondly, awareness of self provides part of the mechanism for rigour in the analysis of data. “The basis of this rigour is the conscious and deliberate linking of the social process of engagement in the

field with the technical process of data collection...I call this linking reflexivity.” Recognition and awareness of the researcher’s effect on the process of collecting data was vital. However, recognition and awareness of these issues were not enough. The key factor was how to manage these issues. This was achieved through reflexivity: “The conscious and deliberate linking of the social process of engagement in the field with the technical processes of data collection and the decisions that that linking involves”, (Ibid.1990: 158).

The research strategies needed to be themselves researchable. The researcher was part of his data. The research was a reciprocal process between the researcher and the other participants in the research. Data are social constructs, a product of the skills and the imagination of the researcher and of the interface between the researcher and the researched. The researcher’s presence was never neutral and stimulated particular responses. These responses were then analysed reflexively. “The fieldworker must weigh the impact and effects of their presence, their personae and the respondents’ perception of them”, (Ball, 1990:68).

## **2.5 The teacher or practitioner researcher**

Hammersley, (1993:1-15), examines the concept of the “Teacher as researcher”. The concept is not a new one. Hammersley identifies a strong teacher research movement in the USA in the 1950s. An influential advocate of this movement was Corey. He defines this form of research as, “Research undertaken by teachers, administrators and others to improve their own practice.” (Corey, 1949:509-14). A key aim of this research was to improve the practice of others. It was anticipated that some colleagues involved in education would be able to gain some value from the work.

The movement in Britain emerged in the 60s and 70s as a response to curriculum reform in schools, (Elliot, 1991). One area of research - curriculum development - shifted from the bureaucratic model. The bureaucratic model became open to criticism because of its narrow focus. The model developed out of the natural scientific method. The teacher as a researcher tradition

moved away from research that was dominated by quantitative methods, often associated with a “top down” approach, to a more eclectic mix of approaches to educational research. Hammersley, (1993:2), believes that the shift was motivated by the concern for process rather than outcomes, and by the switch in audience from the research community and higher level policy makers towards teachers and the public generally. Carr and Kemmis, in their book, *Becoming Critical*, (1986), assess approaches to educational research - the technical interest model, based on the scientific quantitative approach, and the practical interest model based on the interpretive, more qualitative approach.

A significant figure in the teacher as researcher movement in Britain was Lawrence Stenhouse. Stenhouse, (1975:142-65) argues that educational ideas expressed in books are not readily taken on board by practicing teachers. However, educational ideas that are expressed as curriculum specifications are available to be tested by the practicing teachers. Walker, (1989:4) comments that educational research can often be, “More accurately described as research on education” rather than “research conducted primarily in the pursuit of educational issues and concerns”. Stenhouse is aware that not all teachers are capable of or committed to carrying out this research. He distinguishes between the *restricted* and *extended professional*, drawing on the work of Hoyle, (1972).

The work of Stenhouse, Carr and Kemmis has contributed towards a critique of conventional research and the development of the teacher or practitioner researcher movement. Hammersley, (1993:5) identifies four criticisms of conventional educational research and provides a balanced argument for each criticism.

## **2.6 Case Study**

The aim of this research was to understand and interpret events. Interpretive researchers have frequently used the case study because it can provide a unique example of real people in real situations. This can allow the reader to understand ideas more readily than if they were presented as abstract

theories. Yin, (1984) identifies three types of case study: exploratory - as a pilot to other case studies and to develop research questions; descriptive – to provide accounts of events, and explanatory – where theories can be tested. This research used all three.

Case studies can establish cause and effect. They record action in real contexts and recognise the significance of context. The context is unique and dynamic. There is a continual development of relationships and interactions within the context. Adelman *et al*, (1980) describe the case study as the study of “an instance in action”. This instance is of a bounded system - in this case a group of pupils. Hitchcock and Hughes, (1995:317) extend the definition. They identify a series of factors that are characteristic of the case study: rich and vivid descriptions, seeking to understand the perceptions of the actors, highlighting relevant events and the researcher being integrally involved in the case.

The case studies in this research have parallels with the television documentary. The aim was to portray what it was like to be in a particular situation, to capture the participants’ lived experiences and feelings in a particular situation. It was important, therefore to allow events to speak for themselves rather than be continuously judged by the researcher. Several potential problems confronting the researcher using the case study were acknowledged by Nisbet and Watt, (1984:91): being selective in what is reported, sensationalising accounts, making claims that cannot be substantiated and being bland. The case study can make theoretical statements but the evidence presented must support the statement.

Nisbet and Watt, (1984) identify a series of strengths and weaknesses associated with the case study. A wide audience can understand the results because they are often written in everyday language. They can catch unique features separating the significant few from the insignificant many. Insights can be provided into other similar cases. It is possible for them to be carried out by a single researcher and unanticipated events and variables can be dealt with as the research progresses. These perceived strengths are then balanced by

the weaknesses. Generalisability is often perceived as problematic. It can take different forms, from the single instance to the class of instances. It is left to the researcher and the reader to see the potential application. Crosschecking is also a problem. The data collected could be biased, selective and subjective. Having identified these weaknesses the researcher must strive to guard against them. Some strategies are discussed in the different sections - *Myself as the main research instrument; Bias*.

## **2.7 Bias**

Hammersley, (1993), provides a balanced argument for the debate that surrounds the issue of bias when research has been carried out by practitioners who are close to the action. For each advantage perceived, Hammersley, (1993:219) gives a counter argument. He concludes that: "There are no overwhelming advantages to being an insider or an outsider....each position has advantages and disadvantages". Hammersley's reasoning is very sound but the intention in this research was to utilise all the advantages of being an insider whilst being mindful of the disadvantages.

The concept of neutral, value-free research is discussed by Eisner, (1986). He concludes that all methods and forms of representation are partial. Bias may be an inevitable consequence and can be evident throughout the entire research process, not just in its conclusions. What is important is that the researcher faces up to these biases. Myrdal, (1969:52), wrote: "Biases are thus not confined to the practical and political conclusions drawn from research. They are much more deeply seated than that". Lacey, (1974:65) wrestled with the issue of bias in his research at Hightown grammar. The more traditional anthropologists questioned his research proposals. They felt that due to his own experiences of school he could not obtain the necessary distance, his subjectivity would be a barrier in carrying out the study. By contrast Glesne and Peshkin, (1992:104), write: "My subjectivity is the basis for the story that I am able to tell. It is a strength on which I build. It makes me who I am as a person and as a researcher, equipping me for the selection of topics...to the emphasis I make in my writing. Seen as virtuous, subjectivity is

something to be capitalised on, rather than to exorcise.” Radnor, (2002:32), adds to this debate by discussing the concept of cultural understanding - when the observer is in a familiar location and is aware of how he or she and other people react within that context. Radnor believes this to be a distinct advantage, in that situations can be read with far greater accuracy and in a shorter time than if the researcher was in a culturally unfamiliar setting.

## **2.8 Triangulation**

Triangulation may be defined as the use of two or more methods of data collection in the study of some aspect of human behaviour, (Cohen et al, 2000:112). The term originates from maritime navigation or surveyor measurement technique. Several locational markers are used to develop an accurate perspective. Triangulation in educational research attempts to map out or explain more fully the richness and complexity of human interaction by studying it from different stand points.

Any method of data collection is susceptible to bias. Using more than one method of data collection helps to overcome the risk of error. This technique is known as “multi method triangulation”. However, it should be acknowledged that in research of this nature - social science research - methodological errors would always be very probable. Denzin, (1970), extends the concept of multi method triangulation and identifies other forms of triangulation: time triangulation, space triangulation, combined levels of triangulation, theoretical triangulation, investigator triangulation and methodological triangulation. (See Cohen *et al*, 2000:113).

Time triangulation attempts to address the problem of taking a snapshot of an event at one point only in time. Space triangulation is a concept that is beyond the capability of most practitioner researchers. It calls for triangulation by investigating across cultures and sub cultures. The notion of combined levels of triangulation refers to three levels of analysis adopted by many social science researchers: - the individual, the group and society. Combining levels of triangulation means that situations are analysed by more than one level of analysis. Investigator triangulation refers to the use of more than one

researcher to observe or record an event. There are obvious implications in introducing a third party into an interview or classroom situation. Denzin, (1997:300), develops the notion of methodological triangulation by identifying two categories. "Triangulation within methods" concerns the replication of a study as a check on reliability. "Triangulation between methods" involves the use of more than one method in the pursuit of a given objective. One of the commonest forms is to combine interviews with observation. (See Woods, 1979, and Lacey, 1976). In Lacey's review of his methodology for Hightown Grammar, (1979:125), he describes the range of methods that were deployed. He considered his main methodological achievement was the way in which these combined, triangulated and fed into each other. This formed a "spiral of understanding...escalating insights through moving backwards and forwards between observation, analysis and understanding". Lacey combined effectively both qualitative and quantitative approaches. This could add to Denzin's examples above and be termed triangulation between methodological approaches.

Triangulation was employed in this research to support the concepts of reliability and validity. Observations and interviews were used to gather data on pupil perceptions - *multi method triangulation*. The observations and interviews took place over many lessons; observers were instructed to take a longitudinal perspective - *time triangulation*. Observations and interviews were conducted in four schools - *space triangulation*. Some of the observations were conducted by members of the Delphi group - *investigator triangulation*. A group of pupils were interviewed and then a semi-structured interview schedule was designed to numerically crosscheck their responses. This gave numerical data that could be quantified but stemmed from data that was originally qualitative in nature - *triangulation between methodological approaches*.

## 2.9 The Delphi group

As a reflective practitioner carrying out Action Research it was inevitable that a range of researchable issues emerged. The practicalities of doing the research – relevance, time, fulfilling professional duties – meant that the range of researchable issues needed to be focussed. The researcher developed criteria to prioritise the issues that emerged. The criteria were based on the practicality of doing the research. However, there was a danger that the research could be over-influenced by the researcher's own bias towards a particular range of issues. Action was taken to alleviate this through carefully planned discussion with other people who were part of the research; in this case, teaching colleagues and support staff.

Focussing can be achieved through Nominal Group Technique, (Morrison, 1993, Cohen et al, 2000: 237). The researcher gathers information and presents a group of participants with a series of statements, questions or issues. The group then responds individually in writing to the presented information. Their comments are displayed and individuals in the group are invited to comment on the responses. These verbal responses are added to the written responses. The members of the group are then asked to identify clusters of responses, to give structure to the information. A group discussion ensues and meanings are clarified. Finally the researcher invites comments about the structures and meanings that have emerged.

This technique allows for individual responses to be included within the group response. It is also less susceptible to personality effects such as members following the lead of the dominant member of a group. The data can be organised and shared by the group. The process allows for individual disagreement to be registered. Its chief disadvantage in my setting was that it operated through a group meeting together. It would be difficult to arrange a time when all the group members would be available to meet for what could be a relatively time-consuming meeting.

Another method of focussing is the Delphi Technique developed in the 1950s at the Rand Corporation, (Toffler, 1970:462). The process of data collection is similar to that of the Nominal Group Technique but does not require members to meet as a whole group. The researcher asks the group to make written responses to a series of issues, questions or statements. This can be done at the individuals' convenience. The researcher gathers the responses and collates them into clusters. A group response begins to be formed. The information is then fed back to the group members for further reaction and comment. This gives the individuals in the group opportunity to agree or disagree with the group responses. Further responses may be collated and returned. The process ends when there is identification of clear consensus.

The researcher collected, collated, synthesised and re-circulated the data. The advantages were considerable for the group members as it allowed for flexibility in its application and also addressed issues of confidentiality as it protected the individual group members' right to privacy. Judd, (1972) comments that the Delphi Technique is of particular use in an educational context when attempting to find consensus as to values and evaluations; for example, in obtaining consensus on the characteristics of a "good lesson" or a "good teacher".

This research used a developed version of the Delphi Technique. The group members were used to give feedback in the traditional Delphi sense and also assisted in gathering data through conducting observations and informal interviews with the pupils. None of the group were "qualified researchers". They were very supportive and their contribution was a major factor in making the research achievable. The dynamics of the group were well established and they accepted my direction on how to conduct the tasks but remained confident to challenge and contest any claims made. The Delphi group consisted of a design and technology teaching colleague, the Special Educational Needs Coordinator, (SENCO) and a teaching assistant with experience of working with the target group. They had worked together for at least eight years in a supportive environment where listening to colleagues was an essential factor. This allowed for a more longitudinal perspective to be

applied. The Delphi group was utilised to explore issues emerging during the action research and to limit the danger of single observer bias. Details of the Delphi group are given in appendix 1.2; details of the pilot activities are recorded in appendix 1.3 – 1.7.

## **2.10 Interviewing**

The purpose of this section is to discuss the reasons for the use of interviewing as a method in this research. The research question asks: *What are the factors in design and technology lessons that contribute to disaffected and low ability pupils being engaged in learning?* A group of these pupils and a section of the staff were interviewed to gain their perceptions and responses to this question. In this section the following will be reviewed:

- The characteristics of a qualitative research interview
- Types of interview
- Why interview?
- Where to interview?
- Whom to interview?
- When to interview?
- Group interviews
- The design of the interview
- Interviewing – advantages and disadvantages
- How to gather the data
- Analysing the data
- Analysis – the Radnor method
- Topic ordering
- Constructing categories
- Reading for content
- Generating coded transcripts
- Analysis to interpretation
- Semi structured interviews

## 2.11 The characteristics of a qualitative research interview

Wragg, (1984:177), describes interviewing as, “the oldest and yet sometimes the most ill-used research technique in the world”. Interviewing requires skills. These skills, according to Woods, (1996:91), are portrayed through: Understanding and empathy – to gain access to people’s confidences; active listening – showing the other person that the interviewer is attentive; focussing – keeping the interviewee on course; checking for accuracy – pressing points, clarifying ambiguity; and identifying clues and indicators – developing the questions to ask next.

Kvale, (1996:30) sets out a list of characteristic features that should be evident in a qualitative research interview. The topic of the interview is the lived world of the subjects and their relation to it. The interviewer registers and interprets the meaning of what is said as well as how it is said. He/she seeks qualitative knowledge expressed in normal language and attempts to obtain open nuanced descriptions of different aspects of the subjects’ worlds. Different interviewers can produce different statements on the same themes, depending on the sensitivity to and knowledge of the interview topic. The knowledge obtained is produced through the interpersonal interaction in the interview. A well-executed interview should be a positive experience for all participants.

Bird *et al*, (1996:91), share the idea with other researchers - Cannell and Kahn, (1968), Radnor, (2001) - that the interview is a process to which both parties must contribute; a conversation rather than a monologue. Through this focussed conversation process reality can be constructed.

## 2.12 Types of interview

Cohen and Manion, (1980:309-10) describe four kinds of interview. The *structured interview* is one in which the content and procedures are organised in advance. It is therefore characterised by being a closed situation. In contrast to this, the *unstructured interview* is an open situation having greater flexibility and freedom. The *non-directive interview* derives from the therapeutic

interview; the respondent expresses his subjective feelings as spontaneously as possible. Finally, the *focussed interview* focuses on the respondent's subjective response based on a previous interview that has been analysed by the interviewer beforehand. To this list Faulkner, (1991:48) adds the *group interview*. Wragg, (1984:178 – 181) provides an invaluable interviewing checklist for researchers to use to qualify and justify the use of interviewing. During the research a semi-structured interview was developed, and this is discussed in detail in section 2.19.

### **2.13 Why interview? Where to interview? Whom to interview? When to Interview?**

Kvale, (1983:174) defines the purpose of the interview: "To gather descriptions of the life world of the interviewee with respect to interpretation of the meaning of the described phenomena". The researcher must outline questions to which answers are sought and seek the answers to these questions by using the most appropriate data gathering technique. Wragg, (ibid) warns against the researcher adopting interviewing simply because it is almost expected to be found in some form in a thesis.

Interviewing fellow professionals and pupils can present particular ethical problems, (Thomas and Denton, 2006). Griffiths, (1985:210), reflects on this ethical dilemma that could be particularly acute amongst teacher researchers; how could the research affect "the delicate credibility structures amongst one's colleagues?" Fraser, (1997:2) comments that the practitioner researcher has a professional obligation to the subjects of the research; in my case a professional responsibility to pupils, parents and staff. Pring, (1984: 10) adds the realistic factor of re-negotiation. It is not sufficient to negotiate aims and purposes at the outset, as it is possible that these will shift as the project evolves. The researcher must develop a process of feeding back data and sharing findings with the participants. However, this action carries with it the problems of participants being over sensitised and the "Hawthorn effect", (Cohen 2000:116).

The practitioner researcher had an existing relationship with the subjects of the research. These relationships could not be reconstructed; they were already firmly established over a period of nineteen years. In some cases a member of staff was line managed by the researcher whilst in other cases the researcher interviewed a member of staff who was in a more senior position. The nature of these relationships could colour their responses.

The group of pupils all had reading ages at least 3 years lower than their chronological age. The act of reading questions and then writing answers would be affected by their lack of literacy skills. Their experiences at school of similar activities – a comprehension test, sitting an examination – could easily colour their approach to a questionnaire. There was a need to be mindful that interviewing – asking these pupils questions - could also carry negative overtones if the pupils perceive it as a cross-examination exercise. Some of the pupils had little experience of talking openly to an adult, of having what they say taken seriously. The pupils needed to be reassured. Woods, (1996:90) points to the quality of the interviewer / interviewee relationship as being vital in the data collection process.

### ***Where to interview?***

Wragg, (1984:178 – 181) identifies the quality of the environment where the interview takes place as being crucial to gaining useful data. For both staff and pupils, offices in a school setting can be easily associated with disciplinary matters. This may create a negative, confrontational atmosphere before the interview begins. However, the office has the advantage of being able to provide a confidential environment. The confidential one to one interview may allow interviewees to be more open, out of earshot and fear of reprisal. This has to be balanced against the ethical dilemma of interviewing a child or a fellow member of staff behind closed doors in a one to one situation, (Thomas and Denton, 2006).

Interviewing in a classroom / workshop area negated the potentially negative confrontational environment of the office. It was a setting that was both familiar

and secure for both interviewer and interviewee, but would lack the privacy of the office environment. The most open environment would be in non-teaching areas – the yard, the staff room, the hall at break and lunchtimes. Such settings could provide an arena for the interviewee who wanted to sound off in front of friends or, conversely, inhibit the more introverted.

All settings will carry with them some form of value to the participants and have the potential to skew responses. Ideally a range of locations should be used to balance out this problem. Practically, however, as a teacher researcher the research needed to be balanced with other professional commitments. King, (1994:2) asserts, “There is no such thing as a relationship free interview. The relationship is part of the process not a distraction from it. The interviewee is a participant shaping the course of the interview.” The researcher rarely spoke to the pupils in an office setting and only had brief discussions with them in non-teaching situations when on duty. The obvious choice was to interview the pupils in the workshop. This setting was familiar to them and was the environment that supports the relationship between them and the researcher.

The members of staff were interviewed in settings that were negotiated. For example, a senior manager might want to have had access to pupil progress files. It made sense to interview in a setting where this information was readily accessed. In each case details were recorded of where and when the interview took place, the number of people involved, the time of day and even the relevant weather conditions. This would enable the reader to make their own judgements as to the quality and limitations of the data.

### ***Whom to interview?***

Wragg, (1984:179) writes: “Sampling is a problem throughout educational research. A single or a few respondents may be atypical, and a cast of thousands may be equally unrepresentative if badly selected”. Members of staff were interviewed according to their relevance in the research.

A random sample could give all pupils an equal chance to be interviewed. Pupils are chosen at random – for example, every other one alphabetically, three from each form. However, these random samples can be unrepresentative. For example, every other one on the register could be a boy; the three from each form could all be boys. It was decided that random sampling would not be appropriate in a study of this size. The overall samples would need to be much larger to achieve a statistical balance.

A development of random sampling is stratified random sampling, (Wragg, 1984:180). This technique allows for specified groups to be identified in advance as part of the research design. In the above examples the issue of gender imbalance - of having only boys in the sample would be avoided by specifying that a certain number of girls must be included in the random sample.

An opportunity sample is based on those participants who are convenient to interview. They are readily available and are prepared to talk. As a teacher researcher researching into the perceptions of a distinct group of pupils this appeared to be the most likely sample to select. The researcher met the pupils on a regular basis in the workshop. Both the environment for the interview and the group selected were all part of a natural setting.

### ***When to Interview?***

Wragg, (1984:181), also identifies the issue of timing – when to interview – as being critical to the quality of the data collection process. Interviewing this group of pupils at certain times - first thing in the morning, last lesson on a Friday, at the beginning of a term, at the end of a term – could be reflected in the nature of their responses. A pupil's response to a question regarding the quality of teacher / pupil relationships will undoubtedly be coloured by his or her immediate experience.

As a teacher researcher working at the school the researcher had timetabled access to this group of children, which was spread across all the timetable

slots in the school day and across all days of the school week. This allowed interviews to take place across a range of times, and helped address the problem of when to interview. Woods, (1996:92), stresses the above point and calls it “representative sampling”. This should cover not only times but also places and people.

The duration of the interview was also significant. The aim was to make the interviews as a part of the normal lesson and to use a maximum of ten minutes at the end of a lesson. The pupils were familiar with there being a discussion at the end of the lesson. Ten minutes would be slightly longer than the normal recapitulation but would probably be within the attention span of the pupils. To have used more time would create a class management problem - to hold their attention, to keep the interview focussed. As their subject teacher there was a need to balance their participation in the interview with their opportunities to complete class work. In each 10-minute interview a series of questions were asked. If the questions were not fully answered in this time it would carry over into the next lesson. This would continue until all the questions had been addressed.

#### **2.14 Group interviews**

Watts and Ebbutt, (1987) set out the advantages of the group interview. The group interview offers the potential for discussions to develop and yield a wide range of responses. Bogdan and Biklen, (1992:100) comment that group interviews are useful for gaining an insight into what might be pursued in subsequent interviews. These are both supportive reasons to begin this research with a series of group interviews. Cohen and Manion, (2002:287), add a series of practical reasons to support the group interviews: “Group interviews are often quicker and involve minimal disruption...can bring together people with varied opinions...might also be less intimidating for them, (children) than individual interviews”. Managing the dynamic of the group is a challenge. It can be easily hijacked by a small number of individuals. However, as a teacher researcher at the school the dynamics of the group were well known to the researcher. Dominant and submissive personalities were familiar

to the researcher. In these situations the ability to react with local knowledge was an advantage.

The group interview requires skilful management to keep the situation focussed. Cohen and Manion, (2002:287) also point to the size of the group as a key factor in achieving success. Lewis, (1992), summarizes research and indicates that a group of around six would be the optimum size. As a teacher researcher both of these factors presented management difficulties. It would be difficult to reduce the size of the group to six – a reduction of 66%. How would the 6 be selected? Would they be the same 6 each lesson? Where would the other pupils be supervised? The discussions over location and the size of the group are all governed by the researcher's position within the school. Ultimately the decisions that were arrived at were compromises between attempts to carry out "good" research and fulfilling duties as a teacher at the school. All the pupils present on the day of the interview were part of the sample.

Staggering the interviews over a 10-lesson period helped to reduce the novelty aspect of the questioning and allowed for some degree of flexibility.

This flexibility also helped overcome the problems presented by group dynamics – would only the vociferous be heard? What about the quiet ones? What about absent pupils who might have something vital to share with me? Creating further opportunities for the pupils to respond – to come back at break time or lunchtime – offered more flexibility. It also allowed pupils whose voices are not easily heard in the group situation a greater opportunity to take part. These interviews were not time bound in the sense that they were one off and of a predetermined duration.

## **2.15 The design of the Interview**

The design of the interview with these pupils was a combination of Cohen *et al* (1980:309-10) description of the four kinds of interview. Radnor, (2001:60), also designs her interviews drawing on all four elements. She begins by asking open questions to elicit responses to her research questions. These open

questions are supported by what she calls “pick ups”. These “pick ups” are areas of information which are deemed important to the research question. If responses to the original open questions are not sufficiently focussed she uses these “pick ups” to develop further questions. Radnor sees three main advantages in this interview technique:

- It keeps the interview free flowing. Subsidiary questions can be introduced seamlessly into the flow of the conversation
- Information on the same topics can be gathered in a range of interviews
- The interviewee has the opportunity to expand on her perceived priorities

Both Woods, (1996:91) and Radnor, (2001:60) emphasise the skill of active listening. Radnor, (2001:61) gives advice on how to carry out the active listening interview. Wragg, (1984:189) strongly recommends that interviews should be piloted. The questions should be scrutinised by a suitably qualified third party, ideally more than one. (The Delphi group members performed this task). The questions should then themselves be piloted with a group of respondents which is similar in make up to the group that will ultimately be interviewed. (See pilot interview, appendix 1.3)

Radnor’s use of “pickups” was adopted, but there was awareness that these interviews could unearth other relevant information. It would be methodologically unsound to ignore this potential of gathering data outside of the themes identified in the “pickups”. Flexibility must be retained to react to opportunities if and when they arise. The primary question to be investigated was: *What are the factors in Design and Technology lessons that contribute to low ability pupils being engaged in learning?*

This was researched using the following preliminary questions:

- How do the pupils perceive themselves at school?
- Pick up: self esteem, confidence, ambition, reference to school pecking order

- What are the pupil's perceptions of technology lessons?
- Pick up: relationships, subject content, teaching styles, resources
- How would you describe a "good lesson"?
- Pick up: relationships, subject content, teaching styles, resources
- When did they become aware of their feelings about the relationship between themselves, the subjects they study and the school itself?
- Pick up: self esteem, confidence, ambition, reference to school pecking order

These preliminary questions were then used to generate further questions.

## **2.16 Interviewing – advantages and disadvantages**

### ***Advantages***

King, (1994:22), identifies flexibility of use as a key advantage of interviewing: "It can address quite focussed questions on aspects of organisational life...experiences...or much broader issues...The qualitative research interview is ideally suited to examining topics in which different levels of meaning need to be explored."

There was also flexibility within the interview itself. There were questions and pickups scheduled but also an awareness that the interview could lead outside these parameters. This type of interview allowed the researcher the flexibility to pursue these points and created the potential for greater depth of data collection.

The interview allowed the researcher the opportunity to clarify questions and responses. If a question was misunderstood or was unreadable in a questionnaire then the usefulness of the data generated would be dubious. The pupils were able to ask the researcher questions to clarify any uncertainties. They were familiar with being asked questions at the end of a lesson. This series of interviews tapped into that familiarity. The interview had the potential to be the least obtrusive of methods. King, (1994:23), suggests that interviewees actually enjoy being interviewed. During informal, pastoral discussions with these pupils they have been pleased to be asked their opinions and have readily shared them. Oppenheim, (1992:81-2) adds to this theme of participation. He suggests that interviews have a higher response rate compared to questionnaires because participants feel more involved in the research process.

### **Disadvantages**

Interviewing can take up a great deal of time. Developing an interview schedule, carrying out the interviews, transcribing and analysing the interviews are all potentially very time consuming. Managing the interview is a skill that needs to be developed, especially in the case of a group interview that will always run the risk of being hijacked. King, (1994:23) also identifies “data overload” as another perceived disadvantage. Interviews can generate a great deal of data. This creates problems in how to collect and how to code and analyse the data. The researcher can feel overwhelmed. Transcribing the significant interactions of a 10-minute interview was more manageable than an hour-long interview. Manageable transcriptions, around 1 A4 sheet per 10-minute interview, were compiled for each interview.

The sample size was a problem in this research. As a practitioner researcher there were constraints due to professional obligations. The same could be said for generalizability but reliability was addressed through triangulation, and in the case of the interviews, respondent validation.

Tuckman, (1972) identifies four sources of error – the interviewer, the instrument, coding and sampling. Cohen and Manion, (2002:269) also identify the interviewer as a potential source of error. The interviewer can be prone to bias and subjectivity and therefore needed to ensure that appropriate measures - for example triangulation / respondent validation – were in place to guard against these problems.

### **2.17 How the data is gathered**

The researcher had interviewed similar groups of pupils during the course of an Open University M.A. course. The obvious method of recording was to use a tape recorder. This was assumed to be a fairly unobtrusive method. However, ethically it was assumed essential to tell the pupils that their conversations were being taped. This provoked a range of responses:

- A pupil withdrew and refused to have anything he said taped. He had experience of giving taped statements to the police and to him the use of the tape had negative connotations.
- Another pupil refused to take part because he felt that his voice would be recognised. This would ethically compromise my promise of confidentiality.
- A girl in the group sang in local clubs and wanted to hold the microphone. During the interview she was egged on to give a song.
- Some pupils were unusually quiet and said very little during the course of the interview. After the interview had finished they confirmed that they had silently opted out. Rather than making a bold statement as in the first two examples their actions spoke for them.
- Most of the group watched the tape recorder. It became the focus of their attention.

This attempt at using a tape recorder was not repeated. Using a video was also considered. However, there would be the same issue of acting up to the camera and an even more overt, ethical threat. Pupils would be physically identified. Other methods would be used to gain appropriate data.

The next interview was recorded by taking notes as the interview progressed through the schedule. This too came across too formally and detracted from the flow of the interview. The researcher could not write fast enough to keep up the comments and had to continually stop and ask for statements to be repeated. This led to frustration for the pupils and for the researcher. From these experiences the researcher developed a system of recording interviews with the groups of pupils and staff. The system is outlined below:

The interview took place at a convenient time, e.g. at the end of a lesson, and was no longer than ten minutes. During the interview, very brief notes were taken – key points, both verbal and non verbal. As soon as the interview and lesson had finished these key points were fleshed out. Due to the brevity of the interview it was found that this could be done quite accurately. See appendix 2.3 for an example of a transcript.

The next interview – the following lesson – began with reading the transcription to the pupils. The transcription could contain a verbatim story from the pupils, or it could be a more descriptive account; how the group felt about a particular topic, recorded using key points rather than being a literal account. This solved many problems in terms of recording the information and also problems of accurately transcribing. The group could verify the accuracy of the data. Group needs to be stressed because often an individual group member disagreed with the retelling of the interview. In cases like this the consensus would be accepted. There were reasons for the lack of unanimity – a pupil might have changed her mind about an incident from one day to the next, especially if she played a part in the incident. Honesty and confession might be her approach one day, whilst denial and distancing herself from the event may be the case the following day.

“Pupil 4 was angry when she told me about Mr 5” –

Pupil 4, the following day, “No I was not!”

Rest of group – “You were!”

Contextual issues could also be recorded – facial and physical gestures. How people reacted to each other in the group – how long is a pause? Tape recordings fail to capture these essential factors. This non-verbal data could be verified in the same way as the verbal discussed above. The chance of misunderstanding a non-verbal gesture would be as great as misunderstanding a verbal account.

Individual accounts could also be checked and further clarified either at the time of the interview or informally during the course of a lesson. “You were not happy with the way I read your story – how would you want to tell it?”

Involving the pupils developed trust. The interview transcripts had all identifying names omitted. The pupils felt that their confidentiality was being secured.

Reading the anonymous accounts back to the pupils gives them a feeling of recognition. This made the pupils part of the research. They became familiar and more comfortable with the format of the interview. This created a situation that cultivated frank exchanges of view.

The cyclical nature of these interviews reflected the cycle identified in action research. Each interview builds into and informs the next. This technique resonates with Kvale’s, (1996:183) proposition that: “Interviewee’s statements are not simply collected by the interviewer, they are in reality, co-authored.”

### **2.18 Analysing the data -*The use of computers***

Historically, analysis in qualitative research was an entirely paper based activity. Computer technology now offers an alternative technique of analysis. A range of computer programmes which assist the process of qualitative analysis are now available. “The Ethnograph” produced by Qualis Research

Associates is a popular example; others include NUD.IST, Qualpro, Word Match, and Word Cruncher.

These computer programmes enable the researcher to carry out sophisticated and rapid searches of textual data. The data would be typed in using Microsoft Word or a similar package. The programme numbers each line and the researcher identifies key phrases and themes that emerge in the course of an interview. Ethnograph allows the researcher to code each theme and even allows for overlapping themes and according to King, (1994:21), nesting. Nesting is the term used to describe a situation where themes within a theme emerge. The programme can then seek out these coded themes in the other transcribed interviews. (For further information see Prein, Kelle and Bird, 1995:190 – 209)

The deployment of such programmes would appear to be essential in order to carry out qualitative analysis of what could be potentially a great deal of data. However, whilst acknowledging the potential of these programmes there were several obvious disadvantages:

- A need to acquire and master the use of such a programme. Would it be best use of time to develop these skills or to use more traditional methods of analysis?
- King, (1994:22), writes that there is a danger that researchers might design their studies and analysis around the programme that they have and can use most effectively
- By reading and re reading the transcripts the researcher has a greater chance to identify a broader range of themes, sub-themes and overlapping themes. There would be a greater opportunity to immerse oneself in the data
- Using a word processor allows editing and movement of text from one document to another, from one category to another as it arises

## **Analysis – the Radnor method, (Radnor, 2002:71)**

There are many useful suggestions as to how to analyse qualitative interview data – see Cohen and Manion, (2002:282 / 86). As a practitioner researcher, Hilary Radnor has developed an approach based on the notion of,

“Helping to order the data so that it is possible for the researcher to consider them clearly. It advises a consistent, thoughtful ordering (not a mechanistic one), so as to encourage rigour without rigidity” (Radnor, 2002:68). Radnor identifies six steps, (Ibid: 71) outlined below:

- Topic ordering
- Constructing categories
- Reading for content
- Completing the coded sheets
- Generating coded transcripts
- Analysis to interpreting the data

### ***Topic ordering***

A list of the topics that emerged from reading the whole text was created. The original interview questions provided a percentage of these topics. It was essential, however, to read the transcripts carefully and with an open mind to allow further topics to be identified. After identifying all the relevant topics they were pasted as headings onto individual pages. Each topic was given a simple abbreviation, e.g. relationships – “rel”. This process was carried out with ease using a word processor.

### ***Constructing categories***

Having identified the topics, the categories within each topic were constructed. Radnor, (Ibid, 72) identifies two common categories: those that are explicit in the data – e.g. a respondent’s given reasons for liking a particular activity; and those that are implicit – responses to do with attitudes. The transcript then needed to be reread and the topics that had been identified fleshed out with sub headings. The sub headings were generated from the areas of interest,

issues and concerns discussed in the course of the interview. These sub headings were the means by which the categories were constructed. Using the topic of relationships, the discrete page started to look like this:

Topic: Relationships Code: rel  Categories: 1. with staff 2. with other pupils 3. with themselves 4. with the school 5. with the outside world 6. with family 7. with SMT
---

Fig 2a

### ***Reading for content***

The transcribed text could then be read for content. The text was coded and marked so that the section could be found easily again. Radnor, (ibid:73) uses the following method, which is better illustrated than explained (see figure 2b overleaf). The following is an exemplar extract from an interview:

Code: Rel describes relationships

Rel 1s describes relationships with staff

Rel 1sa describes the first extract in the transcript relating to relationships with staff.

Rel 1sb, describes the second extract that relates to relationships with staff.

Rel 1sc, describes the third extract that relates to relationships with staff.

Fig. 2b

Code	Person	Text of interview
Rel 1sa	Pupil	I really get on well with Mr.4. He's always got time for us. We do work but he lets us have a laugh as well.
Rel 1sb		P5 always tries to wind him up, but he never does. P5 is a prat. He does it with all the teachers.
Rel 1sc		We don't mind him winding up Miss 3 – nobody likes her anyway.

**Completing the coded sheets**

Using the above system the original coded sheet, fig 2a, was then completed as shown in figure 2c

<p>Topic: Relationships Code: rel</p> <p>Categories:</p> <ol style="list-style-type: none"> <li>1. with staff – 1a,1b</li> <li>2. with other pupils – 2a</li> <li>3. with themselves</li> <li>4. with the school</li> <li>5. with the outside world</li> <li>6. with family</li> <li>7. with SMT</li> </ol>
---

Fig 2c

This process was repeated for the other topics and their categories. The data was identifiable both in terms of its location in the main text and also on the one sheet. This gave an overview of the data collected for each category and assisted in assessing the significance of each category. For example in Fig 2b the simple extract given has been recorded. In a live situation categories 1, 2, 3, 4, 5 and 7 could generate many responses and perhaps category 6 has only

generated one response. The significance of this response could then be reassessed.

***Generating coded transcripts*** – See appendix 2.2, 2.3,2.4,3.2

Using a word processor the data identified in each category was copied and pasted. Radnor, (ibid:79) stresses the importance of “copying” rather than “cutting”. It was vital to keep a master copy of the original transcription intact because chunks of data were moved from the original to other places. These data chunks may well have had information within them that could be categorised elsewhere. Categories found in relationships could overlap with those constructed for lesson content or teaching styles. There was always the possibility that new categories would emerge from other interviews.

***Analysis to interpretation***

This is the final stage of analysis; the researcher interprets the data rather than describes it. The coded transcripts were supported by the researcher’s comments as to their significance. These comments summarised the findings within the category as interpreted by the researcher. The completion of this stage enabled the researcher to read with some insight the findings of the research for each identified topic. The next step was to identify relationships and patterns across topics and categories. Radnor, (ibid:90) believes that this leads to an ability to “make abstract conceptualisations of the phenomena under study”

**2.19 Semi-structured interviews**

Exploring the target group’s perceptions was not straightforward. The group’s literacy skills were weak, which contributed to their reluctance to engage in formal written work. In addition, as a teacher researcher, one’s presence potentially influenced pupil responses, (Hammersley, 1993:219). To alleviate this problem a semi-structured interview approach was adopted, (Cohen et al 2000:245). This was developed in such a way that the special needs coordinator (SENCO) could administer it. Woods, (1996:90) points to the quality of the interviewer / interviewee relationship as being vital in the data

collection process; a need to “develop the kind of trust and rapport that encourage people to relax”. The pupils knew the SENCO, a rapport and trust existed between them, and yet she would not be perceived as “belonging” to any particular subject.

The interview schedule was required to measure pupil understanding of the term “relevance” and to gain data on what they perceived as a relevant subject. It was acknowledged that collecting data from other subjects could be ethically contentious. However, all members of staff were aware that action research based on a theme of engaging pupils in learning was ongoing. Other subjects had to be included to establish a benchmark. The data needed to be in a form that would be readily analysed, (Wilson and McLean, 1994:5). The use of a semi-structured interview addressed both of these issues.

In order to triangulate data, the researcher had established a Delphi group (Toffler, 1970:462) within the design and technology department. They were asked to discuss the issue of relevance with these pupils. This was carried out informally in one-to-one situations or in small groups in a range of settings: classrooms; workshops; in between lessons; and at lunch times. The Delphi group met, pooled their findings and generated two broad interpretations of the term “relevant” that resonated with the definitions identified by the researcher.

The list of subjects was selected by timetable analysis. All the pupils studied English, mathematics, science and design and technology. To include every subject studied by all the pupils would have created a list of 16 subjects. The compromise was to include music, engineering, history and information communication technology, (ICT). These were selected because a substantial percentage, over 50% of the sample, was studying the subjects in KS 4. The data collected from these subjects could be of professional interest but comparisons could not be drawn between these subjects and the subjects that every pupil studied.

The format of the semi-structured interview needed to be user friendly. The group of pupils at the centre of the research were particularly sensitive to

'wordiness' and to being patronised. The solution was to word the statements as simply and briefly as possible. The SENCO checked the statements for their readability and then developed a more detailed script. She would read through the statements with each group, and amplify each from her more detailed script. The target groups were a group of 16 pupils in year 11 and a group of 14 in year 10. Cohen *et al*, (2000:258) emphasises the need for clarity, for short unambiguous instructions to support each section of the semi-structured interview. This first draft of the interview was then re-circulated to the Delphi group as a further check.

A battery of statements was established using simple language. Pupils were asked to assess the level of their agreement with these interpretations of the term "relevant" using a rating scale. Rating scales offer a flexible response and the ability to offer frequencies, correlations and other forms of quantitative analysis. The scale selected was a 6-point version of the Likert, (1932) rating scale ranging from 6 very strongly agree to 1 very strongly disagree. The 6-point scale was selected to avoid the neutral mid point that may have provided an easy option for pupils to select without much thought. The 6-point scale can also indicate the intensity of agreement / disagreement. However, the assumption cannot be made that the scale between intervals is mathematically accurate. A person who records 1 as a response does not necessarily have 3 times the intensity of disagreement than the person who scores 3, (Oppenheim, 1992:190-5). Rating scales have other limitations. The recorded responses may not accurately reflect what the respondents' opinion might be. The flexibility of a semi-structured interview enabled the researcher to add supplementary questions to clarify issues. The pupils were encouraged to add comments they felt were appropriate but not covered by the schedule. These would be recorded as qualitative data. The pilot semi-structured interviews are recorded in appendix 1.6.

## 2.20 Observation

This section discusses the reasons for the use of observation as a method in this piece of research. The research question asks: *What are the factors in design and technology lessons that contribute to disaffected and low ability pupils being engaged in learning?* A group of these pupils were observed to gain their perceptions and responses to this question. In this section the following are reviewed:

- Observation strengths and weaknesses
- Forms of observation
- How and what to record

Observation allows the researcher to understand the context of the event. Issues can emerge that participants might not want to talk about or are unable to verbalise in an interview situation. Adler and Adler, (1994:382) comment that, "observation produces especially great rigour when combined with other methods". Denzin, (1997: 300), identifies that triangulation between methods involves the use of more than one method in the pursuit of a given objective. One of the commonest forms is to combine interviews with observation, (Woods, 1979, Lacey, 1976).

To carry out the observation the researcher takes on a particular role within the context being observed. Gold, (1958) typifies four roles that the researcher can assume when observing. These range from complete observer, observer / participant, participant / observer to complete participant. Adler and Adler, (1994) and Atkinson and Hammersley, (1983) argue that all social research is a form of participant observation; we cannot study social life without being part of it. Adler and Adler (1994:378) put forward the traditional role of the observer as being non-interventionist. This clearly could not be the case in the context of this research. Ethically, as a practitioner there would have been a duty to intervene had an incident occurred. The methodological problems of "Myself as the main research instrument" and "The teacher as researcher" have been

discussed in earlier sections. These emerged once again in the act of observation.

The aim initially was to observe the researcher's own practice. This created, as described by Radnor, (2002:49) "a cultural understanding". Radnor explains that this can enable the researcher to read into situations with greater accuracy and in a shorter space of time. Morrison, (1993:88) adds that being immersed in a particular context gives the researcher a more holistic view of the interrelationship of factors. Immersion can facilitate 'thick descriptions', (Geertz, 1973) that can be more accurately explained and interpreted rather than relying on the researchers own inferences. However, there are dangers in having a cultural understanding and being immersed in the situation. The observer could make assumptions about what is happening, based on prior knowledge of similar events rather than focussing on the one under study. The problem of personal observational bias is identified in Radnor, (2002:52). Sharing the data with the participants, (Lincoln and Guba, 1985, Willis, 1977:197, Mac an Ghail, 1988:142) and cross checking with information from interviews helped to prevent observer bias. This was successfully carried out in the pilot interviews and pilot observations.

## **2.21 Forms of observation**

The form taken by the observation can range from highly structured to unstructured. A structured observation will have identified what needs to be observed and have categories worked out in advance. The structured observation will have its hypotheses decided and will use the observational data to confirm or refute these hypotheses. The unstructured observation will be more open as to what needs to be observed. The observation needed to be carried out as a means of identifying significant factors. Radnor, (2002:51-59) illustrates the advantages and disadvantages of these techniques by referring to exemplar studies carried out by her PhD students. Greta favoured an open ended, unstructured approach to observation. She had piloted a structured observation schedule and found that this was superficial because significant meanings were missed. Amany had worked out a detailed observation

schedule that gave details of background information, environment, teaching resources and a five-minute checklist that ran for the duration of the lesson. He felt that this approach gave him the richest description of practice across 18 lessons and was an aid to analysis. These examples emphasise the importance of piloting and developing a personal technique. The observational pro-forma can be found in appendix 1.4 and the pilot observations are recorded in appendix 1.5.

A combination of approaches was used. The unstructured observation allowed critical events that were then developed into categories, to be identified. Wragg, (1994: 64) defines a critical event as one that illuminates or typifies a particular action of an observed incident. These events may not be routine yet can be very revealing. They may be unpredictable and would therefore be difficult to include as a category in a structured observation schedule. The critical event, once identified, was then discussed with the Delphi group and included as a category in a more structured observation schedule if deemed pertinent.

## **2.22 How and what to record**

The initial, unstructured observations were recorded in field notes. These were written at several levels ranging from pure description to reflection and may take the form of fragmentary jottings. Cohen et al, (2000:311 – 313) provide a comprehensive list of elements that need to be included, drawing on the work of Le Compte and Preissle, (1993:224), Lincoln and Guba, (1985:273) and Spradley, (1980). Using these perspectives the observation notes included information on the following:

Context – the physical setting, time of day, weather conditions

Timing – an indication of when, how far into the lesson

Persons – the people that are taking part, how many of them, their characteristics

Activities – the aims of the lesson, in terms of teaching and learning

Resources – what resources are deployed

Reactions – how the pupils are reacting to the activities identified above

Critical events – things that are deemed noteworthy

Feelings – what people feel and how this is expressed

The headings were of a descriptive nature. The notes included: an opportunity to reflect on these descriptions; the methodological issues that emerged; the ethical problems that confronted the researcher; points that needed more clarification; and identifying lines of further enquiry. The notes were focussed on recording the observable; any inferences were made explicit. Observation notes included both oral and visual data and relied on the observer's reaction to events. Audio-visual data collection had the advantage of overcoming the partialness of the observers' view. However, audio-visual data collection was not used for several reasons: ethically all the participants and their comments would have been identifiable, and the issue of reactivity - the pupils performing for the camera - would have been problematic.

These categories were then built into the structured observation schedule. Cohen *et al*, (2000:306) suggest that numerical data can be generated from the structured observation schedule. This allowed for comparisons to be made between settings, situations and frequencies. Patterns and trends emerged and could be numerically calculated. The researcher devised a means of recording the data – a cross or tick. The categories were then ticked off as the observation continued. Categories were discrete and did not overlap. It was obvious from this that a structured observation schedule needed to be carefully piloted. Checks needed to be made to ensure that all relevant categories were covered, and that the observer was physically capable of recording the information during the observation. The preparation process was time consuming, but analysis of the data could be rapid. Developing a structured observation schedule enabled colleagues to carry out observations – triangulation within methods.

Care was taken to ensure that colleagues were consistent and followed a common approach to entering the data. The four principal ways of entering data onto a structured observation schedule were: event sampling – a simple

mark against each statement each time it is observed; time sampling – the researcher recorded what is happening in each category at a specific time interval; interval recording – the researcher recorded what has happened in the previous time bound interval; and, rating scales – the researcher makes a value judgement whilst recording an event. For example, a teacher's behaviour could be rated on a continuum of 1 to 6, 1 could be very supportive whilst 6 would be unhelpful.

Structured observation can provide useful numerical data, (Bennet *et al*, 1984, Galton *et al*, 1980) but there are concerns about its overall effectiveness. Cohen *et al*, (2000:309) argue that the method is behaviourist, and excludes the intentions and motivations of the people being observed. There can be an assumption that the observed behaviour provides evidence of underlying feelings. It is difficult to infer a particular meaning to a series of freeze frame snapshots of an event. Observation needed to be used in conjunction with additional data gathered from other sources. The notion of triangulation – between methods, within methods, using different observers – was central to generating reliable evidence.

A similar method of recording preliminary observations was used as for interviewing. Some details were entered into a pocket log before the lesson starts, quick jottings could be made as the lesson progressed and then fleshed out at the end of the lesson. The observations were then formally written up as soon as possible. This created an opportunity to reflect on the descriptions, and any problems that emerged, and identify points for further clarification or development. The next lesson began by reading the key observation notes to the pupils in the same way as for interviewing. This was an aid to credibility and validity.

There was always a danger of pupil reactivity to this type of situation. Cohen *et al*, (2002:156) advise remaining in the field for a considerable amount of time and the careful presentation of the researcher's self as strategies to address the Hawthorne effect. Lave and Kvale, (1995:226) found that reactivity was greatest when the participants were placed into new situations. Making this

short discussion a normal part of the lesson helped to reduce this perceived problem of reactivity. Ethically the researcher must ensure that the pupils were not placed in strange situations.

The notes were written up consistently as soon as the lesson finished. The same method of analysis based on Radnor, (2002:71) was implemented. This supported the developments of categories and the creation of a structured observation schedule.

## **2.23 Literature Review Methodology**

The aim of the literature review was to provide a clear, balanced picture of current leading concepts, theories and data relevant to the research question: *What are the features of design and technology lessons that motivate disaffected and low ability pupils to engage in learning?* The method of achieving this aim is similar to Hart's, (2003) recommendations. The scope of the question and the nature of the research meant that initially a broad approach was adopted. The researcher used key words identified in the research question to focus the review.

Published books were skim read and relevant sections highlighted. The references from these sections were then used to identify further reading. This process was repeated for the newfound reading. References from the newfound reading were used to identify further reading. Relevant information was filed under broad headings: reading for the methodology; design and technology; low ability pupils; teaching and learning; motivation; engagement in learning; and disaffection. Records of the references that contributed directly to the research were updated at regular intervals.

It is inevitable that this method of conducting a literature review is labour intensive. However, all the reading provided, to some extent, useful background information, and contributed to developing both depth and breadth of perspective. The reading at this early stage was broadly focussed. This approach is common in a qualitative inductive research.

Using published books has a disadvantage in terms of time scale. The theories and discussion may reflect the opinions of the authors up to the date of publication. To gain a more current review of contemporary concepts articles in Journals were accessed. The IDATER journal was of particular use in the early stages. The references for each article were used to identify further reading. As a practitioner researcher working from home, electronic E-journals proved particularly accessible. Access to Loughborough University's library facilities via the Internet was also essential.

The Internet allowed access to the work of fellow researchers. This included abstracts, theses, bibliographies and conference proceedings. This not only contributed to a deeper understanding of the research question, but also produced contrasting theories. The theories contrasted either within the literature itself, with the researcher's professional experience of the phenomena described, or with the research findings.

The identification of contrasting theories contributed directly to focussing the research. Relevant issues that had emerged in the literature review had been summarised. These were then cross-referenced with my observations and interviews. A matrix was developed where the issues identified in the literature review were matched with those that had emerged in the research. The extent of the match or mismatch / agreement or disagreement between the emergent issues was assessed. Research questions were developed where claims in the literature could not be verified by findings based on the research experience, where there were conflicting claims made within the literature itself and where the literature called for further research to be carried out. Issues sometimes emerged in the research that had not appeared in the literature. This situation prompted further literature searches as described earlier.

A major factor in carrying out the review was time management. Reviewing the literature must be an ongoing activity; it must support the research through all stages. A balance must be struck between carrying out the literature review and doing the research. This balance was achieved through the concept of

“Sufficiency”, (Denton and Norman, 2004). “Sufficiency” in this context can be described as when new factors emerge less frequently. The factors that emerge strengthen the issues that have been identified rather than add new factors to the research.

## **Chapter 3 - Literature Review**

*The aims of this chapter are to: to develop an understanding of the terms used in the title; to examine the existing academic discourses that relate to this study and to compare and contrast between these academic discourses with specific reference to the primary research question. This section is made up of 6 parts: Part 1- design and technology, Part 2 - low ability; Part 3 - learning and teaching; Part 4 - engagement in learning; Part 5 – disaffection; and Part 6 - motivation*

### **3.1 Design and technology - a brief historical overview**

Designing and making have been necessary skills for the survival of the human race, (Dodd, 1978:14). These skills have been refined, developed and passed on to the next generation. The utilitarian nature of the subject can be traced back to man's earliest history. This, however, is only one simple strand of its development.

Education in the antecedents of design and technology was taken up by the Charity Schools, Schools of Industry and associated with pauper training and penal institutions, (Penfold, 1988:4). The people who instructed children in these activities were often not “teachers” but artisans. The public / grammar school curriculum based on the classical curriculum was perceived as high status knowledge. These schools were, “the chief nurseries of our statesmen...the largest share in moulding the English Gentleman”. (Clarendon, 1864:56). For the majority of the population a basic education, which would have included some handicraft work, was gained at the elementary school. Six million children attended elementary school at the start of the twentieth century. They were the children of the workers themselves destined to be the workers of the future, (Lawson and Silver, 1985:275). Pupils who attended these schools were tied into a rigid class system; low social status equated with low academic opportunities.

The 1944 Act argued for a tripartite, more egalitarian system – Grammar, Technical, and Secondary Modern. Design and technology, (handicraft, domestic science, etc) subjects became most closely associated with the Secondary Modern School - the school for pupils with “lower abilities” - as measured by the 11+ system of assessment – yet which catered for up to 80% of the school population.

The politics of education during the period from the 1950s and 1960s also contributed. The Crowther Report, (1959) discussed bridging the gap between education and industry. The Report attempted to change people’s perception of the word “practical” as meaning the opposite to “academic”. Crowther argues for an “alternative road” approach to education to enable the country to benefit from the capabilities of all young people. It can be argued that the comprehensive dream never truly materialised. In some areas the Grammar school remains to this day.

The Newsome Report, (1963), discussed education for “pupils of average and less than average ability”. The report underlined the value of practical activities to these pupils. It recognised the subjects’ ability to offer opportunities for learning by direct experience through a medium of expression other than the written word. The Report acknowledged that pupils achieve a sense of pride and satisfaction through positive experiences in the subject. However, “sense of pride” and “satisfaction” were not considered sufficiently educationally enriching.

At the same time there was debate from within the subject as to how it should be taught. “Project Technology” and “The Keele Project” were two curriculum development schemes to emerge from this era. Both were devised to move the teaching of design and technology forward. Some might argue that these were attempts to make the subject more academic, and to raise the educational status of the subject. Penfold, (1988:120 – 122), for example, comments that the majority of craft teachers spent most of their time teaching average and below average pupils. The teaching materials for “Project Technology” were beyond the ability of these pupils.

In the period leading up to the introduction of the National Curriculum, a plethora of courses related to design and technology emerged. They were available at different levels of assessment – *General Certificate of Education* and *Certificate of Secondary Education*, (GCE, CSE). The CSE qualification was designed specifically for lower ability pupils. It followed a structured course with the emphasis on practical outcomes.

The subject's inclusion in the National Curriculum has not been unproblematic. Denton, (1993:71), observes that many teachers over-emphasised the written and graphical aspects of the course at the expense of the practical. Denton, (2003) recalls at this time many County Advisors recommending that machinery and hand tools should be exchanged for clean tabletops and coloured pencils. The subject that engaged low ability pupils in learning, due to its ability“ to offer opportunities for learning by direct experience, through a medium of expression other than the written word”, (Newsome, 1963), was being stripped of the features that contributed to its effectiveness.

## **Summary**

- Design and technology has a link with lower ability pupils through its historical association with Elementary and Secondary Modern schools and its ability to offer opportunities for learning by direct experience, through a medium of expression other than the written word
- Design and technology has a link with knowledge that has a perceived lower status; practical being perceived as the opposite to academic

## **3.2 How is design and technology perceived by pupils, teachers and schools?**

From a brief review of the development of design and technology a concise definition of the subject would be problematic. Design and technology focuses on designing and making activities and developing technological “capability” for all pupils, (DES, 1988, paras 1.42-1.43). Kimbell *et al*, (1996), define

“Capability” as “The means by which a pupil combines skills, knowledge and motivation that transcends understanding and enables pupils to intervene in the world and improve it”. Pupils develop this “capability” to identify problems and then respond to them by designing and making a solution. This interrelationship between modelling in the mind and then modelling in reality has been described as “thought in action” and is fundamental to capability in design and technology. (See Kimbell *et al*, 1991)

These positive statements are echoed in research into the pupils’ perception of the subject by Brochocka *et al*, (2001:23-29). The sample investigated was small, (n=18), but are credible in terms of my own experience. The findings also support the work of Tyers, who accessed a much larger sample in the Crafts Council Learning Through Making Project, (1998). The research found that children enjoy design and technology and in particular making activities. The making activity was the key factor in the pupil’s enthusiasm; enthusiasm in turn is a key factor in motivation.

Tufnell *et al*, (1997:226 –227) found that teachers had positive beliefs about the value of making through practical activities. Teachers who took part in the research believed that pupils who take part in making activities develop skills and aptitudes over and above the practical skills needed for the making activities. These skills include cognitive abilities and personal qualities and attitudes. However, Atkinson, (1993:17 –25), identifies a growing lack of enthusiasm for the subject amongst Key Stage 4 pupils. There is considerable consensus on the issue of pupils’ perceptions of the relevance of design and technology. Brochocka *et al*, (2001:23-29) Growney, (1996:75-79), and Atkinson, (1993:17 –25), all found that the pupils had a low perception of the subject in terms of its usefulness in later life. “Usefulness” in these contexts can be defined as developing skills for future employment.

Design and technology can be conceptualised within schools in many ways. There is the historical argument that the subject does not have the same status as other “academic” subjects. Wellbourne-Wood, (1999:195-199) gives an ethnographic account of the routines and rituals of design and technology

classrooms in Australia. His account resonates closely with my own experience. Design and technology staff are described as “shed men”. However the term is used it carries a powerful image that is inextricably linked to status. Preconceptions of status are grounded in a social, political and historical context. This context shapes perceptions. The perceptions manifest themselves in the life of the school, in the minds of pupils, parents and teachers. Wellbourne-Wood identifies social and geographical isolation as significant manifestations of these perceptions.

Hansen, (2000:85 – 89) discusses the “*Learning preferences and tendencies of Canadian technological teachers*”. He contests that teacher education socialisation research carried out by Zeichner and Gore, (1990), suggests that most general subject teachers adopt some variation of the transmission model of teaching. Technology teachers tend to adopt a more practical perspective. Hansen *et al*, (1992) comment that some technology teachers experience a dissonance between value systems; school managers perceive the values and beliefs about learning held by technology teachers as being unimportant.

The low status of the subject by the educational establishment has been compounded by the subject’s ability to offer itself in an acceptable form to the least motivated of pupils, (Eggleston, 1996:14-15). These findings resonate closely with the findings of Davies *et al*, (2004:147) who undertook research into approaches to teaching pupils with behavioural, emotional and social difficulties in design and technology. The subject has the capacity to offer intellectual activity to pupils who, because of their low verbal capacity, may be excluded from areas of the curriculum; areas that demand a more literate and verbalised response. The nature of the subject and the pedagogy used to communicate it may make the subject more palatable for the less articulate pupils. Ofsted, (Office for Standards in Education) design and technology reports for 2001 and 2002 also identify this capacity to engage lower ability pupils. The conclusions state that pupils with special educational needs make comparatively better progress in design and technology than most other subjects.

## Summary

- Design and technology develops designing and making skills
- Pupils enjoy doing practical work, and making activities develop skills over and above those required to complete a specific task
- Pupils in the literature review had a low perception of the “usefulness” of design and technology
- Design and technology teachers can sometimes be perceived as different from other teachers due to their historical development, their educational backgrounds and the nature of the subject

### 3.3 What are design and technology’s educational features?

Recognition of the educational value of the subject can be traced to early educational thinkers such as Rousseau, Pestalozzi, Herbart and Froebel. All acknowledged the contribution that practical subjects could bring to a child’s education. Rousseau’s general principle in Emile’s education was to teach to learn by doing. “If instead of making a child stick to his books I employ him in a workshop, his hands work for the development of his mind” (Rousseau, 1780, see Dodd, 1978:8). By the mid nineteenth century the general educational benefits of practical education were widely recognised in Britain, (Dodd, 1978:18-19). In Finland, Uno Cynghnaeus was developing a course of woodwork that became known as “Sloyd”. Sloyd taught that practical work should not be seen as simply hand skills but must relate to the development of the whole child. This was a radical vision.

Design and technology was introduced formally into the National Curriculum as a distinct subject in 1990, (Technology in the National Curriculum Statutory order, DES and Welsh Office, 1990). Hendley and Lyle, (1996) identify the process nature of the design and technology curriculum as its defining feature. A move away from “hand me down” outcomes and truths to one in which our own truth is generated, Kimbell, (1997:47). There is a transformation from the pupil being a passive recipient to becoming an active participant - the difference in studying technology to becoming a technologist.

The framework for assessment in design and technology is process not content based. The nature of the cognitive processes is a key to the uniqueness of the subject. Design and technology is more about what might be than what is. Drawings, diagrams plans, models prototypes computer modelling are used to develop the imagined product, system or environment. This as a particular type of creative thinking associated with designers and technologists: - thinking that was different from and complementary to verbal modes of thinking. Kimbell *et al*, (1996:28) also discuss the cognitive process associated with the subject. The unique concrete language used in design and technology– for example, graphics and modelling – facilitates cognitive development. Through this accessible language pupils identify and solve problems in the real world. This further encourages the development of independence and resourcefulness. Kimbell, (1997:46) suggests that Design and Technology “combines practical, intellectual and emotional challenge that is unique within the curriculum”.

Kimbell and Perry, (2001) argue that design and technology has a distinctive pedagogy. The subject draws on a wide range of learning styles, some of which are distinct from other National Curriculum subjects. The task centred nature of design and technology requires pupils to acquire and create new task-related knowledge whilst being able to demonstrate their deployment of existing skills and understanding. The subject utilises the inter-relationship between conceptual knowledge and procedural skills.

Linton and Rutland, (1998) note that practical problem solving activities were used as a successful strategy for working with a Year 6 class of children. The class was composed of a high percentage of pupils with learning difficulties and behavioural problems. Design and technology in this context also encouraged the development of independence and resourcefulness.

Research carried out by Davies *et al*, (2004:143 – 149) reviewed approaches to teaching Design and technology to pupils with Behavioural, Emotional and Social Difficulties, (BESDs). The research confirmed that design and technology could be used to engage these pupils in learning. A series of four

case studies was used to identify common approaches. The subject's ability to offer opportunities for group work, raising self-esteem and its relevance were among the factors identified. Design and technology can be used to help to reduce learning difficulties, (Pearson, 1991:156). Pearson acknowledges the breadth of learning opportunities that are to be found in the subject and makes a series of recommendations as to how these learning opportunities can be accessed. Many of the schemes stem from the notion of scaffolding—displaying key vocabulary as an aid to develop verbal and written skills.

### **Summary**

- Design and technology's contribution to a child's general education has been recognised since the time of the early educational philosophers
- Design and technology directs pupils to be active participants as opposed to passive recipients
- Design and technology offers a wide range of learning opportunities to pupils of all abilities

### **3.4 Low Ability Pupils**

The low ability pupil who leaves school without qualifications has been an accepted feature of many schools. Public examinations were not originally designed for the least able 40% of the school population. Higher rates of truancy among these pupils have been institutionally expected, (Rutter *et al*, 1979:48,72). Serious bad behaviour was dealt with by permanent exclusion. Hargreaves, (1967:87) commented: "If the upper streams passed their examinations and the lower streams did not riot, the school was, for most teachers, succeeding". Performance management of teachers in schools has added more potential pressure onto this group of pupils. Teachers must make decisions as to whether the potential D, E, F or G grade pupil is entered for public examination. The climate is changing. Schools are under enormous pressures of accountability and this slice of school life has to be worked with; not excluded but included.

Low ability pupils fall within the spectrum that is covered by the term “Special Educational Needs”. The development of “Special Education” has its own history. From its inception it is possible to identify strong links between the provision for these pupils and a “practical education”, (Warnock, 1978 para 2.2.) The Liverpool Blind School, 1791, taught handicrafts to pupils as a means of giving them a skill to earn a living.

Section 312 of the Education Act, 1996, states that a child has special educational needs, (SEN) if: “he/she has a significantly greater difficulty in learning than the majority of children the same age”. The term “Special Educational Needs” encompasses learning problems, emotional and behavioural difficulties, and physical disabilities. It is estimated, (Geen, 2001:50) that 20% of children have some form of SEN at some stage in their school careers. The group of participants in this study are all located in the bottom 20% of the Year group’s results in the SAT tests, CAT tests and NFER reading test results.

Identification of a child’s specific special needs will be influenced by the assessor’s particular perspective. For example, a boy refuses to work in class. His refusal may be because of: a medical problem; a pedagogical problem; home and family problems, or the interaction of all or some of the above factors? To give a simple definition of low ability is neither possible nor useful; it denies the intricacy of the term. All pupils bring their own experiences, expectations, differing family and sub-cultural values. The key to identifying a pupil’s special needs is the ability of the assessor / teacher to recognise that pupils experience difficulty in learning due to a range of factors: when there is a mismatch between the starting point for learners; the expectations of teachers; and / or the resources available.

Government has legislated that pupils should be able to achieve in specified areas of the curriculum, irrespective of personal interests and strengths, (National Curriculum, Aims and Purposes, DFEE / QCA, 1999). These statutory requirements can be relaxed through schools requesting disapplication for some pupils, (Education Act, 1996, Section 363).

Disapplication at Key Stage 4 does not include English, Mathematics or Science. In the case of pupils making “significantly less progress than their peers” it is design and technology and / or a modern foreign language that may be dropped. In reality many of the pupils that fall into this lower 20% are not entered for examinations or fail to complete examination courses. In the summer of 2003, “5.4% of 16 year olds, more than 30,000, left school with no GCSEs” (TES, 22/8/03:6).

In a classroom the teacher makes the decision as to how best to meet the needs of the individual pupil. This decision is based on professional and personal beliefs and attitudes about how children learn. These combine to contribute to a personal theory. These theories can be explicit – discussed and reflected on – or implicit – reflected in what you do. The acceptance that children have “special educational needs” has contributed to the development of major theoretical models that have influenced the teaching of children with special needs - Behaviourism, Ecosystemic Approach, Constructivism and Social Constructivism, ( Bailey, 1998, Bronfenbrenner, 1979, Piaget, 1973, & Vygotsky, 1962)

## **Summary**

- Low ability pupils have increased in significance and status due to schools becoming more accountable
- The term “Low Ability” falls within the spectrum covered by the term “Special Educational Needs”. This encompasses learning problems, emotional and behavioural difficulties, and physical disabilities
- Pupils can experience difficulty in learning due to a range of factors: when there is a mismatch between the starting point for learners; the expectations of teachers; and / or the resources available

### 3.5 Learning

Bigge, (1988:1), defines learning as an enduring change in an individual that is “not heralded by his or her genetic inheritance”. These changes can be described in terms of changes of insight, behaviour, perception, or motivation, or a combination of these factors. How effectively these changes are learned, the nature of the processes, is dependent on what model of learning theory is applied to the particular circumstance. Children have always learned a great deal from their parents, their environment and peers. Historically, students learned from teachers or masters who told and showed the students in the same way as they themselves had been taught as students or apprentices. A key to this system was the issue of relevance. Students needed to learn to survive, to execute a particular task, to become a member of a particular group. The advent of a specialist school environment to facilitate learning removed the direct relevance and immediacy that existed in previous contexts, (Bigge, 1988:5). Developments in psychology and the organisational structures of education throughout the C20th contributed to the establishment of particular theories of learning. A theory of learning has, by implication, a set of classroom practices. In this way a learning theory could be used as an analytical tool to judge the quality of a particular classroom situation.

Adey *et al*, (1999:2), build on the notion of learning theory and identifies further concepts of learning to support analysis: “learning styles” and “learning strategies”. A learning, or cognitive, style is a preference an individual has for a particular type of learning. The styles can be expressed in terms of four general styles: wholist, analyst, verbaliser and imager. These styles are often described in terms of a continuum, as most people’s preferred style can be located somewhere between the extreme positions.

A learning style is normally perceived as being more or less permanent. As research in the area develops, this notion is being contested. Tests carried out by Murray-Harvey, (1994) using the Productivity Environmental Preference Survey, found that people changed their learning styles within eight weeks. Pask, (1988) believes that learning styles can be modified to suit particular

learning demands. Learning styles in relation to approaches to designing at Key Stage 4 are discussed by Atkinson, (1995:38).

Learning strategies are a set of factors that can be changed by development and /or teaching, (Adey, 2000:17). Some strategies are concerned with the organisation of information and processing whilst others may focus on time management, emotions and motivation. Learning strategies can be very subject specific or heuristic – applicable in a range of situations. Marzano *et al*, (1988) identify a range of learning strategy skills that can be influenced by teaching: focussing, information gathering, remembering, organising, analysing, generating ideas, integrating, evaluating. It would be evident to a teacher of design and technology that these skills are very much a part of the design process. They can occur naturally during the course of project work. This would give the learner a context and specific subject matter to develop the learning strategy.

There is a strong relationship between students' use of effective learning strategies and their academic achievement, (Adey 2000:19). However, it is not clear whether intelligent pupils are both good learners and also develop good learning strategies, or, whether the development of good learning strategies are independent of learning. Sovik and Frostad, (1994), found that pupils whose achievement fell well below that expected by their IQ levels used ineffective learning strategies. The learning strategy model known as SIM, (Strategies Intervention Model), was found to be successful with a full range of pupils both mainstream and 'special needs'. The model involved three major strands: acquiring information skills, identifying and storing skills and writing skills, (Deshler and Schumaker, 1990; 1993). Conversely, other research carried out by Montague and Graves, (1992), suggests that less able pupils have difficulty in acquiring these learning strategies and making sense of the rules. Less able pupils benefited more from substantive facilitation. The teacher closely supports and guides and asks structured leading questions.

## Summary

- Relevance has always been a key factor in engaging pupils in learning
- A learning theory supports implicitly or explicitly how a teacher promotes learning
- A learning style is believed to be a preference towards a particular form of learning
- A learning strategy is a set of factors that can be changed by development and /or teaching

### 3.6 Engagement in learning

In their essay, *Schools as knowledge-building organizations*, Scardamalia and Bereiter, (1999:274) suggest that learning accompanies everything that we do. They develop a distinction between being engaged in learning and being engaged in a learning activity. Drawing on research by Ng and Bereiter (1991) engagement can appear in various forms: *Task-completion goals*, *Learning goals* and *Knowledge building goals*. In *Task-completion goals*, students can be engaged in a learning activity at a behavioural level. They may not be cognitively engaged but enjoy the socialisation of the activity. These students are learning but the learning is more incidental than planned. In *Learning goals*, students are engaged in learning, they understand the purpose of the activity. They are attempting to learn what the teacher is trying to teach. In *Knowledge building goals*, students are engaged with problems beyond the immediate situation. The learning may be incidental but contributes to knowledge building. The students are cognitively engaged. Take, for example, designing a safety poster, as a learning activity. Pupil 1 could be engaged in learning at a behavioural level, "colouring in". Pupil 2 could be more cognitively engaged in the learning activity and learn a set of important safety rules. Pupil 3 could be deeply cognitively engaged in the learning activity, learning the safety rules, understanding their significance and when they would be relevant to apply. Pupil 4 could also be deeply cognitively engaged in the learning activity and yet not complete the task. Research into safety could be carried out using the Internet to provide information on the social and historical

implications of safety. Pupil 4 has been engaged in learning but this learning is not part of the teacher's aims for the lesson.

Assessing the extent to which a student is engaged in learning is problematic. From the safety poster example, how could the extent of engagement be assessed? Could it be assessed by the graphic quality of the poster, by questioning the pupils after the task had been completed, by observing in a years time if the learning had been internalised? How would the extent of pupil 4's engagement in learning be assessed? What is set out to be taught is not necessarily learned? It is clear that some students will learn more from this project than others. Some will be engaged at a behavioural level, some will address the question of "Is it about safety?" and "Does it look nice?" and some may learn much more from the project because they have pursued objectives of their own, over and above those explicit in the task. Do primary pupils engaged in learning how to sort buttons learn classification skills, or how to sort buttons?

Learning is a broad concept. Engagement in learning can operate at many levels. For the purpose of this research a simple definition of the term will be used. Measurement of the depth of engagement will not be a feature as it will be too problematic to assess. Pupils will be perceived to be engaged in learning unless there is evidence to the contrary. The evidence will range from passive disinterest to active disruptive behaviour.

## **Summary**

- Learning can accompany everything that we do
- Engagement in learning can operate at many levels

### 3.7 Disaffection

Disaffection, according to the Fifth report – “Disaffected Children”, Volume 1, (Education and Employment Committee, 1997/98) - is generally accepted as a term applied to pupils who have become disengaged from the education system, and who are not gaining a positive experience of life at school or college. There are many reasons for disaffection – ranging from personal / social problems at home to the provision of an inappropriate curriculum at school. The consequences of disaffection include poor attendance, under-achievement and exclusion. All these issues have been highlighted by recent changes in government legislation - publication of league tables, (Education Act 1996, Section 537) and inclusion policies, (Human Rights Act, 1998, and The National Curriculum in Wales, 2000, Section G.) The consequences easily spill over into society at large and contribute toward social exclusion. The cycle of deprivation is maintained rather than dismantled. The drive to make schools accountable and the cost to society has highlighted disaffection as an issue that is real and needs to be addressed.

Disaffection has a substantial price tag. Funding for the schemes vary for each local authority. The Rathbone schemes discussed below all require funding over and above that which would be expected for a Key Stage 4 pupil, (Currently in the researcher’s LEA, £2800 per year per pupil above the standard educational rate). Costs of provision for pupils excluded from school can exceed that amount many times over. These costs increase significantly when the social and economic cost implications – e.g. vandalism, limited economic contribution, - are added. Schools are under increasing pressure to retain ownership of these pupils both financially through the cost of providing alternative provision, and through legislation where decisions over what is best for the pupil can be lengthy, contested and contentious. (See Geen, 2001: 313, *Phelps v Hillingdon LEA*).

Research highlights that some parents and educationalists believe that the National Curriculum is unsuited to the needs of certain children, especially those with special needs and learning difficulties, (Kinder *et al*, 1996, 1988).

The need for a curriculum which maintains pupil motivation is strongly urged by OFSTED, (2001, chapter 8) and echoed in the findings of other studies - Kinder *et al*, (1996, 1988), and, Blythe and Milner, (1999).

The Rathbone organisation's work with disaffected and excluded pupils, "Choices for Life", (Hustler *et al*. 1998) is particularly appropriate in the context of this study as it is based on a series of 11 qualitative case studies. The findings comment on the pupils' perceptions of and experiences of schooling. Four strands are identified: school is not perceived as being relevant, pupils needed activities that were practical involving adults other than teachers; pupils had developed a negative relationship with the school or particular Staff and pupils at the school; many of the pupils had "something else" happening in their lives - problems with relationships at home or school or in a peer context; and, schooling reinforces a view of the pupils as being not worthy and dismantles their self-esteem, (Hustler *et al*. 1998:14 -15).

Research into teaching approaches for pupils with Behavioural Emotional and Social Difficulties, *BESDs*, (Davies *et al*, 2004:145 - 149) found that design and technology was a useful vehicle to combat many of these features. They identified the relevance of design and technology as a major factor in motivating pupils. The subject offers a range of useful vocational and life skills. Good lessons are those that utilise the child's known interests, (Daniels *et al*, 1998:5.5). Examples in the case studies included; basing projects around new technologies such as mobile telephones because pupils were interested and excited about them, designing and making products that could be used by themselves and their peers, and, providing a framework to which the pupils could apply a theme of personal interest. Building up a pupil's self-esteem was also identified by Davies *et al*, (2004:145) as an area to which design and technology could make a positive impact.

The complexity of the nature of disaffection can be illustrated by the interrelatedness of these strands. The disaffected are not a homogenous group; there exists a spectrum of disaffection. A disaffected pupil could have any combination of the above factors in any measure. Could it not be that the

design and technology teaching at the researcher's school address issues that these strands identify?

### **Summary**

- Disaffection- is generally accepted as a term applied to pupils who have become disengaged from the education system, and who are not gaining a positive experience of life at school
- Disaffection has a substantial price tag
- Four strands of disaffection are identified: school is not perceived as being relevant, pupils needed activities that were practical involving adults other than teachers; pupils had developed a negative relationship with the school; many of the pupils had problems with relationships at home or school or in a peer context; and, schooling reinforces a view of the pupils as being not worthy and dismantles their self-esteem

### **3.8 Motivation**

Geen, (2001:34) defines motivation as a psychological force that drives a person to follow a course of action. The literature suggests that there is a strong connection between motivation and learning. Winch and Gingell, (1999:150) believe that, "Motivation is thought to be one of the most powerful influences on learning. If some one has the motivation to learn, they are likely to succeed in doing so." Similarly, Pollard and Triggs, (1997:245) comment that "when motivation falls, with it goes concentration, commitment, quality and in some cases, control." Pearson, (1991:160) also comments on the relationship between low ability pupils, their levels of motivation and their self-esteem.

Writers such as Kyriacou, (1997) and Good and Brophy, (1987), distinguish between different types of motivation: *Intrinsic motivation*, the extent to which pupils participate in an activity to satisfy their own curiosity and interests. For example, pupils design and make a product that satisfies their own curiosity and interests; *Extrinsic motivation*, when pupils engage in an activity in order to

satisfy some goal that is rewarding but external to the activity itself, for example – praise from a teacher or parent, achieving qualifications or respect from other pupils, avoiding the consequences of failure. This form of motivation is again evident in design and technology lessons. Praise from a teacher or parent for a well-made product is all the more real when the product is tangible. It is something that any parent can understand – it works, it fulfils its purpose. Respect from peers is more real for the same reasons and probably given more readily, because the job well done is not a piece of writing or a maths investigation. Instructing a pupil on how to use a machine safely invokes this extrinsic motivation in terms of the pupil's fear of the consequences of failure. These young men and women want to relate successfully with machines. Developing skills involving the use of power tools and machinery have implications that are adult. The context of where the learning takes place is significant, (Goffman, 1979). He observes that when a young man does not know an answer in a classroom setting he feels stupid. When the young man does not know the answer in a garage setting he not only feels stupid but also has his masculinity challenged; *Expectation of success*, the extent to which pupils feel that they are likely to succeed at a particular activity. Activities that are most likely to elicit this form of motivation are those that are challenging yet achievable through application and effort, (Good and Brophy 1987). I feel that it is this form of motivation which could be the most problematic in the execution of coursework projects at Key Stage 4. Spreading a task over a long period of time can create problems for pupils who are used to coping with very short-term targets.

Project work has a motivational advantage for some pupils, (Down, 1986, Stables, 1993). However, Atkinson, (1994) argues that project work can cause pupils motivational problems. Workload can significantly increase due to pupils being over conscientious or teachers having unrealistic expectations. The issue of motivation is complex as it can fluctuate and be determined internally or externally. Motivation has an intricate relationship with external forces such as culture, context, parental and teacher expectations.

Could design and technology, due to the practical mastery of skills element, offer opportunities to motivate low ability and disaffected pupils? To not know a piece of academic knowledge would be acceptable to the group. To be not competent at using a machine could provoke a different reaction.

## **Summary**

- There is a strong connection between motivation and learning
- Three forms of motivation have been identified -Intrinsic motivation, Extrinsic motivation and Expectation of success
- Design and technology offers many opportunities to satisfy these forms of motivation
- The context of where the learning takes place is significant

## **3.9 Teaching**

To teach is to cause learning. However, learning can take place without teaching. It has been argued, (Hirst, 1975), that teaching is a polymorphous concept; it is not just one activity. The term teaching encompasses a large number of strategies. These are discussed below. However, irrespective of what teaching strategies are implemented, they need to be executed by a 'teacher'; a person who embodies the strengths and failures, the best and worst features of human nature.

There has been an historical traditional perception of the teacher as a figure of authority. There is much evidence of a brutal regime that was enforced through corporal punishment. This traditional perception has changed, Geen, (2001:69). The developments in the antecedents of design and technology in the 1960s were mirrored in other subjects. There developed a greater emphasis on project work, on active and experience learning. The relationship between pupil and teacher changed to reflect these external and internal changes.

There is a growing body of evidence that expresses grave concerns over the present day quality of the teacher / pupil relationship, (Ofsted, 2001). There is a series of factors that commentators believe to have influenced this decline. These range from: social deprivation, unemployment, changing parental attitudes, the influence of the media and progressive educational teaching methods. What is clear is that in order for the teacher to teach there must be an environment created that allows this to happen. Traditionally the teacher has played the main part in creating this environment through being in a position of authority.

Geen, (2001:73), makes the distinction between epistemic authority – “being an authority” – an expert in some field; and institutional authority – “being in authority” – where one person has the right to direct the actions of others. Weber, (1947) identifies that institutional authority may take three forms: traditional, charismatic or legal - rational. Berliner, (1985) argues that what the teacher does is called teaching for historical reasons. The activity could better be described as managing learning experiences. Ensuring that pupils are engaged in learning and making appropriate progress. Rogers, (1998:196 - 208), also rejects the traditional concept of the teacher and develops the notion of being a facilitator of learning. He believes, (1998:197) that “significant learning rests upon certain attitudinal qualities that exist in the personal relationship between the facilitator and the learner”. The attitudinal qualities identified are difficult to measure and are briefly outlined below:

*Realness or genuineness* – teachers can often show themselves to their pupils as roles; to play the part. The teacher should be a real person not a faceless embodiment of a curricula requirement. *Prizing* - caring for the learner, *acceptance* - an acceptance of the learner as a separate person, *trust* - a two-way trust. Empathetic understanding - the teachers’ ability to understand the student’s reaction from the inside, a sensitive awareness of what the process of education and learning seems to the student. From the pupil’ perspective it is the difference between being understood as opposed to assessed, evaluated and judged.

## Summary

- Teaching is a polymorphous concept; it is not just one activity. The term teaching encompasses a large number of strategies
- The relationship between pupil and teacher is changing to reflect changes that are occurring in school and in society at large
- The quality of the teacher / pupil relationship can be a significant factor in pupils being engaged in learning

### 3.10 Teaching strategies

The following is a summary of teaching strategies that are relevant to the research question:

The role and persona of the teacher can be interpreted through many perspectives. The polymorphous nature of the activity ensures that all teachers use a range of teaching strategies. The following is a discussion of these strategies and their relationship to design and technology and the low ability / disaffected pupil.

Instruction – involves the teacher in directly imparting knowledge. The objectives of the learning are clear. Unlike written communication the instructions can be adapted to the appropriate cognitive level of the class. However, instruction does not guarantee understanding. Understanding involves grasping the new concepts and being able to apply them appropriately.

Supervised practical work – provides the opportunities to practise skills and develop understanding. The practical work needs to be set at an appropriate level for pupils to cope. Practical work needs to be monitored so that errors can be corrected as they emerge. A designing and making task can also offer a tangible reward. The process of making a useful and aesthetically pleasing artefact can often impact positively on the pupil's self-esteem, (O'Conner, 2000:197). The National Association of Advisors and Inspectors in Design and

Technology, (NAAIDT, 2004) recommend that tasks need to be carefully planned to match skill levels with levels of challenge. Tasks need to have clear parameters and be partly prescribed to ensure that all pupils can experience a sense of achievement.

Questioning - good questioning encourages students to become active learners. Good questioning encourages understanding, helps the teacher through feed back to establish if learning has taken place and where correct responses are confirmed, increase pupil motivation, (Geen, 2001:15). Design and technology offers a rich and varied learning contexts that can support both higher and lower order cognitive questioning, (McNair *et al*, 2000:128 - 133).

Heuristic / discovery methods – Dewey, (1938), strongly advocated a learning system that involved the pupils' interests to attain motivation, a practical approach, the formulation and testing of hypotheses and the drawing of conclusions. A survey carried out into teaching strategies in design and technology found that the discovery method did improve motivation but it was generally felt that it required a greater degree of intelligent thought on the part of the pupil, (Geen, 1989).

Investigative assignments / project work – 60% of assessment in GCSE design and technology relies on this type of work. The value of such work to pupils is it can be meaningful and relevant to them. Atkinson, (1993:20) however, observes that project work can have an opposite effect and serve as a means of de-motivation. She found that pupils generally enjoyed the practical work but became disengaged with the writing and designing aspects of the project. Could a social constructivist approach as identified by Cox, (1995) and Vygotsky, (1962), be used to support learning in this context?

Class discussion – is described by Petty, (1995:159) as “a free flowing conversation, giving students an opportunity to express their opinions and ideas to their peers”. The extent to which this can take place will be governed by the pupils' ability to communicate verbally. The low ability pupil is often associated with poor communication skills. Awareness or even embarrassment

of his or her own poor communication skills can be heightened in a mixed ability setting. By teaching these pupils as a discrete group it is envisaged that this factor can be removed and the pupils will be encouraged to discuss issues as a group and develop language and communication skills in the process.

Group work – This is an umbrella term which can be used to label a group of activities which each merit closer scrutiny. Collaborative learning can be an aid to pupil motivation, (Wilkinson, 1999:201). He distinguishes between peer collaboration and collaboration with experts and points to the benefits of both in terms of supporting learning through the design process. Schools that adopted a collaborative approach at GCSE were almost twice as likely to complete project work compared to schools that adopted an interventionist approach, (Atkinson, 1995:42). A range of pedagogical advantages can arise out of team working – enhanced motivation, improved idea generation, dealing with design ambiguity through discussion, (Denton, 1996:113). Cooperative learning can enhance pupil learning in several ways including motivation, providing formative feedback, developing social skills and students take responsibility for their own learning, (Koutsides, (1999:55). Design and technology is a very rich environment for cooperative learning. Cooperative learning can be used with all ability groups; low ability pupils can experience success and increase their understanding of ideas by explaining them to others, (Featherstone, 1986). For children with low self-esteem being a valued member of a group can also raise self-esteem, (Greenhalgh, 1994:89).

Critical point inputs – A short, focussed teaching strategy that supports learning. Critical inputs can be effective in helping children recall and transfer previously learned knowledge, (Denton, 1994:61). He suggests that they are particularly effective in supporting project work in design and technology. Critical point inputs can help to focus lessons, share developments and learning from different on-going projects, and, if well managed could be a motivational tool. This strategy could be particularly useful with low ability groups. An accepted feature of such groups is their inability to remain on task for extended periods. Academic Engaged Time, AET, is a term used to describe a pupil's application to a task and positively correlates with

achievement, (Leech and Ingram, 1989). Denton, (1992) found that AET rises when children recognise the relevance of specific learning to their own future.

Use of information communication technology, ICT – Ofsted, (2002), reports that in some schools the standard of pupils' work in design and technology has improved by using computer-aided design, (CAD) and computer-aided manufacturing, (CAM). ICT can benefit pupils by enabling them to produce high quality outcomes. These outcomes can range from research to desktop publishing to three-dimensional modelling. The potential to raise standards is considerable. Davies, (2000) acknowledges the motivational potential of using ICT whilst identifying the classroom management problems that are inherent with the use of ICT. In a pilot study of 413 schools to assess the impact of CAD/CAM, Breckon, (2000) found that ICT could assist pupils who have poor drawing skills or lack confidence in presenting their design thinking. The use of ICT can also allow a pupil to take part in a learning experience without the pressure of dealing with adults or their peers, (Davies *et al*, 2004:147). Could the use of ICT in my setting be appraised? Could these findings regarding motivation and developing confidence effects be measured in my context?

### **3.11 Points for further reflection**

What is the connection between the researcher's design and technology teaching and the identified group of low ability / disaffected pupils?

**Low status** – both design and technology and the low ability / disaffected pupil have an historical affiliation to low status in terms of how schools have valued them.

**Relationships**– there is evidence in the literature that identifies the potential of design and technology teachers to be perceived as different from mainstream teachers, (Wellbourne-Wood, 1999, Hansen, 2000, Eggleston, 1996). Their arguments are based on issues of perceived lack of status. Hustler, *et al*, (1998) found that the disaffected pupils in that study favoured practical activities involving adults who were not teachers. Could this perception of the

design and technology teacher being a 'non teacher' be a positive factor in forming working relationships with a group of pupils that have had negative experiences with school and the teacher as traditional symbol of authority?

**Relevance** – Design and technology can bring the relevance of the real world into learning. Kimbel and Stables, (1996) comment on the use of concrete language making the subject accessible to a wide range of pupils. Relevance is identified by Hustler *et al*, (1998) and OFSTED (Feb 2001), as being vital to engaging pupils in learning.

## **Chapter 4 – Case study 1**

**What are the features of design and technology lessons that motivate disaffected and low ability pupils to engage in learning?**

*This chapter reports on observation of lessons in design and technology by the researcher and a Delphi group, and a series of interviews aimed to gain the perceptions of disaffected low ability pupils in relation to design and technology, school and themselves. In order to focus the research the results are analysed and then discussed in relation to the findings of the literature review. One of the findings suggested that pupils at this school had a very positive perception of the “relevance” of design and technology. In contrast, the literature reviewed suggested that pupils in their samples had a low perception of the “relevance “ of design and technology. The next phase of the research would be to explore the pupils’ perception of the term “relevant”.*

### **4.1 Introduction**

This pilot case study focuses on observation of lessons in design and technology by a Delphi group, and a series of interviews aimed to gain the perceptions of this disaffected low ability group in relation to design and technology, school and themselves. The sample was 30 pupils from year 10 and year 11, (see glossary) low ability / disaffected groups. This section presents a summary of the background to the work and the methodology employed. Results are presented and then discussed. Finally, conclusions are drawn relating to how this action research project will develop.

The aim of this case study is: To explore and analyse the teaching and learning experiences of this particular group of pupils in design and technology

**Primary question to be investigated:**

What are the features of design and technology lessons at this school that motivate disaffected and low ability pupils to engage in learning?

### **Secondary questions to be investigated:**

What features do staff perceive as being significant in the process of motivating disaffected and low ability pupils to engage in learning in design and technology lessons at this school?

What are the pupils' perception of design and technology at this school?

### **4.2 Background**

This case study reports work completed at the outset of a longer term action research project by the Head of design and technology in an 11 to 18 comprehensive school. Curriculum and staffing constraints conspired to create a distinctive group in design and technology of low ability and disaffected pupils: a "sink" group. The group consisted of a maximum of 16 pupils, 70% of these being boys. Analysis of GCSE results over a three-year period identified that this group were gaining their best results in design and technology. Ipsitive analysis, comparing the same pupils' results in different subjects, showed an average of +2.0 for the period. The Head of design and technology sought to identify factors that contributed to this.

### **4.3 Methodology**

Two primary methods were employed: observation and interview. Observation was carried out by the researcher and the Delphi group, (Toffler-1970: 462) using a semi structured observation schedule, (see appendix 1.4 for the schedule and appendix 1.5 for the pilot observations). A range of interview techniques were used including semi-structured interviews with the Delphi group observers. These were based on their debriefed observation records. Group interviews were used with the pupils. Interviews were analysed based on the Radnor technique, (Radnor, 2002); see appendix 1.3 for the pilot interview report. The Delphi group consisted of a design and technology teaching colleague, the Special Educational Needs Coordinator, (SENCO) and a teaching assistant with experience of working with the target group. The

dynamics of this group were well established. They had worked together for at least eight years in a supportive environment where listening to colleagues is an essential factor.

The Delphi group carried out a series of lesson observations and were then interviewed to clarify and develop their observations. The pupils were interviewed as a group. The data gathered was checked and discussed with both the Delphi group and the pupils. This offered the possibility for triangulation through respondent validation and supported the reliability of the data. The Delphi group's observations provided opportunity for investigator triangulation and their subsequent follow up interviews created a context for multi method triangulation.

In order to focus the research this data was then sifted in connection with the findings from the literature review. The aim was to recognize themes in the literature that matched the findings of the focussing case studies and then to identify themes that appeared not to match. The themes that appeared not to match could then form the basis for further investigation.

**4.4 Findings from lesson observation and staff interviews** – *transcripts of the observation notes and subsequent follow up interviews with staff are contained in appendix 2.1 and 2.2*

The three members of the Delphi group had no previous experience of undertaking educational research. The group was briefed on observation procedure as recorded in the methodology section. However, the three Delphi members recorded their reflections, their observations of significant factors over an extended period, as opposed to an observation of a lesson. T1 begins by stating "My observations are based on working together for the last 20 years." It could be argued that this more longitudinal perspective has produced more accurate data. The data is not a result of a snap shot of a one-hour lesson but the result of a much longer period of observation; time triangulation. However, it should be acknowledged that these observations could be more strongly influenced by personal reflection / bias over time than observations

made on an immediately preceding lesson. Despite the three Delphi group members misunderstanding my original intentions, I believe that the data they produced is relevant to the research. The data is sufficient both in terms of quality and quantity for me to continue the focussing exercise.

The observation notes were analysed. In each case the author clarified the meaning of the observation with the observer and the following clusters of issues emerged relating to the target group:

- Attendance is better in D&T than in other subjects
- Behaviour is better in D&T than in other subjects
- The variety of learning experiences, use of machines and tools, created opportunities in D&T for the pupils to develop self-confidence
- Teacher's enthusiasm contributes to the enthusiasm of the pupils
- Exemplar material helps the pupils understand what they need to do
- Gender issues – girls' behaviour and attendance is better than the boys in this subject
- Group composition – the mixed ability of the group affected the confidence of the lesser able pupils
- Group work is a useful method of teaching the group
- The teacher had a generally informal relationship with the class
- Key skills could be developed through D&T
- Options choices were often not choices; pupils reacted negatively to the lack of choice
- Ownership – taking ownership of the project motivates the pupil to do well over a long period of time
- Practical subject – the practical nature of D&T engages the pupils
- Prizing / praise are key factors in developing and sustaining positive pupil / teacher relationships
- Relationships – pupil / teacher relationships are good in D&T, pupil / pupil relationships are better in D&T
- Relevance – the subject was perceived by the observation team as being relevant

- Scaffolding – step-by-step instructions are issued / ICT can be used to support the presentation of the work and thus improve confidence
- Social skills can be developed in D&T
- Tangibility – dealing with three dimensional / concrete issues rather than the abstract
- Timing – teaching was delivered in short, sharp bursts

Reading over the brief transcripts, it became clear that each observer had their own perspective. All observers commented on relationships in some form. T1, the design and technology teacher observed lesson structure; T2, the teacher's aid observed behaviour; T3, the special needs teacher observed social skills. R, the researcher observed lesson structure. The pupils discussed relationships, the practical nature of the subject and the "option choice" problems

These were then fed back to the Delphi group. The sources of the above observations were not identified. This may have influenced the opinions of the group – Mr 44 said that so it must be right! The group were asked to agree or disagree with the identified issues and to add to the list any issues that they felt were relevant and not recorded. All agreed that the identified issues were pertinent. The following issues were added to the list:

- Environment – the setting of the lessons was important, it was not a formal classroom setting
- Adult nature of subject / world of work – "using real tools and machines"
- Mastering practical techniques and developing confidence/ self esteem as a consequence of this

The amended list was then fed back to the Delphi group. This time the Delphi group were asked to score out of 5 the significance of the identified issue – 5 was high, 1 was low; the maximum cumulative mark therefore was 20 and the minimum 4:

20-Enthusiasm  
20-Practical subject  
20-Relationships  
18-Exemplar material  
18-Options choices  
18-Prizing / praise  
17-Ownership  
17-Timing  
16-Environment  
16-Tangibility  
15-Scaffolding  
14-Group work  
14-Informality  
14-Relevance  
14-Mastering practical techniques  
12-Behaviour  
12-Confidence -  
12-Group composition  
10-Key skills  
9-Social skills  
8-Adult nature of subject  
7-Attendance  
4-Gender issues

The above exercise was useful in that it began to prioritise issues. However, after reading the transcripts many times, two factors emerged: The identified issues all needed greater clarification; developing this clarification would produce further data that in turn would deepen and help focus the research

The three members of the Delphi group were interviewed. The transcripts of their observations were used to structure the interviews. Questions were developed to address the two factors identified above. The Delphi group were given the transcripts of their “observations” to look over prior to the interview. They were told that the issues that they had identified needed greater

clarification. The interviews can be read in full in appendix 2.2. The findings are summarised below.

From the observations and subsequent interviews it was evident that there were designing and making activities taking place, (see para. 15, 37). The significance of the practical activities was also identified, (see para.11, 13, 21, 33, 47, 53, 54). The practical activities gave an added dimension to the lessons creating opportunities for engaging in learning that are perhaps easier to develop in design and technology than in other subjects. The relevance of the subject appeared to be reinforced through the teaching techniques used, (see para. 11, 21, 37, 39, 47, 57). The pupils, in their group interview, identified the issue of relevance – “lessons are interesting, you can see what you are doing, it’s like having a proper job – using tools and machines and stuff.”

The “quality of relationships” was identified as being significant. T1 comments: “Relationships are very good between R and these pupils. He is consistent, there is an informal feel to the lessons and confrontation is rare. With this type of group that is surprising”. T3 observed: “The children, during the activities, have developed a mature attitude when working in pairs and sharing out tasks. Skills such as turn taking, sharing work and equipment and understanding that they have different abilities have also begun to develop further”. The department develops positive relationships with the pupils. (See para. 8, 11, 13, 17, 29, 33, 40, 47, 54). T2 noted that: “They get on well with the design and technology teachers” and, “They like to help out some one else because they can show that they can do something better than someone else.” These positive observations can be contrasted with negative comments regarding relationship problems that the group occasionally display. There is evidence from the class profile that many of the pupils in this group have relationship problems. (See para. 3, 29, 35, 42, 51)

Enthusiasm was a key factor that emerged. The evidence gathered suggested that the pupils and the teacher were enthusiastic, (see para 19, 37, 56). T1 comments: “Enthusiasm is a key factor in getting on with this group of pupils. I believe that they react positively when they are made to feel that there is

someone taking an interest in them” and “I feel sometimes that we are enthusiastic because enthusiasm is infectious. If we are not enthusiastic then we can’t expect the kids to take an active interest in the subject.”

Using the data from the group profile, (see appendix 1.1), it is evident that this group would fall into the category of low ability and disaffected. The data collected in the clarifying interviews supported this claim, (See 3,19,26,42,51,56). A range of learning strategies were employed: practical work, use of exemplar material, collaborative learning, scaffolding, critical inputs, (see para. 13, 21, 23, 33, 47, 49). There was evidence of a social constructivist approach to teaching. This perspective stresses the importance of scaffolding to guide and support pupil participation in activities and the interdependence of the pupil with other pupils and adults. Examples of this approach are the use of exemplar material, (15,21,37) the high tolerance of making mistakes, (11,13,19). The clarifying interviews suggest that the design and technology department works to develop self-esteem, (See para.11, 13, 19, 56).

The subject was being communicated to the pupils as something that was relevant, (See para. 11, 21, 37, 47, 53). T1 comments: “The use of the exemplar material from previous years helps them understand the relevance of the work – if I am going to make this I will need to find out ...how big? How much? How strong? These problems are then broken down into tasks.” T3 observed: “The reinforcing of the real world element by staff – I often hear staff say ‘you have to learn to queue, there’s only one band saw’. Simple relevant reality.”

Several issues emerged in the above discussions. These were divided into two groups: broad ranging issues and more focussed issues. Broader issues were: the quality of relationships, the relevance and practical nature of the subject, developing self-esteem and confidence, improving social skills and behaviour. The more focussed issues were: timing and lesson management, use of exemplar work, group work.

#### **4.5 Findings from pupil group interviews – transcripts of the interviews with pupils are contained in appendix 2.3.**

The pupil interviews produced some responses that correlated with the observations and follow up interviews carried out with the Delphi group. The main difficulty was maintaining the focus of the interview to address the question: *What are the groups' perception of design and technology at this school?* The experience of the pilot interviews had uncovered the tendency for the pupils to become personal in their comments about other teaching staff. The issue is also discussed in the ethics section. The assurance of some form of anonymity can be perceived by some pupils as an opportunity to vent their feelings. However, much of their venting was of little direct relevance to the research. After analysis of the group interviews the following issues emerged:

Relationships, Prizing, Praise

Practical nature of the subject, Tangibility, Relevance, Scaffolding,

Options / compulsory subjects

The issue of relationships featured prominently, (see para, a, b, e, h, j, k, n, p). The pupils appreciated being treated as adults. Gestures such as having the radio on while they worked seemed to be greatly valued. Relationships had deteriorated in some lessons in other subjects. These subjects tended to be the compulsory lessons that had not been opted for. Relationships in design and technology were supported by “prizing” – a concept identified by Rogers, (1998:196 -208). Rogers asserts that significant learning rests upon certain attitudinal qualities that exist in the personal relationship between the facilitator and the learner. From the pupils' perspective it is the difference between being understood as opposed to being assessed, evaluated and judged. “Prizing”, at its simplest means caring for the pupil, showing that the teacher values the pupil. This can be promoted through the use of praise and also through ensuring equal opportunities. The pupils in this group were given the same materials as the pupils in the other group and were entered for the same examinations.

The pupils particularly enjoyed the practical activities within design and technology. Using machines and tools was like having a “proper job”. Making a product made it easier for the pupils to see what they were doing. There was a sense of tangible achievement. This in turn appeared to support the pupils’ positive perception of the relevance of the subject. The pupils also valued the scaffolding support that they were given with their folder work. The use of exemplar material helped the pupils to see what needed to be done and how it could successfully be achieved.

#### **4.6 Discussion - linking the literature review with the focussing activity**

Many factors have been identified as being significant: the quality of relationships, the relevance and practical nature of the subject, developing self-esteem and confidence, improving social skills and behaviour, timing and lesson management, use of exemplar work, group work, and options / compulsory subjects. All of these identified factors may have the potential to motivate disaffected and low ability pupils to engage in learning. The factors may contribute directly individually, or in various combinations and with different weightings within these combinations. All of the identified factors are worthy of further research.

This discussion section examined these identified factors with findings in the literature. Comparison of the factors identified from the literature review and those identified from the case study could identify discrepancies and hence problematic areas on which to focus the research. Those factors identified by the literature review and confirmed by the case studies could be assumed to be of very low priority for further research, although evidence relating to them might emerge during the action research programme and could be usefully reported in the final thesis.

At some stage in any practitioner research the overall shape of the research needs to be considered. Radnor, (2002:36) uses the analogy of coiling, the technique used to make clay pots.

1. The potter makes the coil – *The researcher collects data*
2. The potter attaches the coil to the base and adds coil to coil – *The researcher analyses the data, collects more data and analyses again*
3. The potter blends a new coil to an existing coil – *The researcher interprets from the analysis so far*
4. The potter continues the process until the object is complete – *The researcher repeats the process of collecting, analysing and interpreting until a picture emerges worthy of presentation*

This analogy is helpful as it highlights both rigour and artistry. The analogy can be developed further. The potter reacts with the process and the material that is unique to that particular pot – *The researcher must also react to data and incidents as they unfold*. There must be a balance between data collection and analysis, a sensitive interaction with the raw material and the development of a holistic picture. The processes of making the pot and the processes of carrying out research are subject to evaluations that are both ongoing and summative.

Some data had been collected but the final shape of the pot had not been resolved. The research was at point 1 on Radnor's analogy. This section helped focus the research. The shape of the pot began to emerge. As a reflective practitioner carrying out action research it was inevitable that a range of researchable issues emerged. The practicalities of doing the research – relevance, time, fulfilling professional duties – dictated that the range of researchable issues needed to be focussed. The researcher must develop criteria to prioritise the issues that emerged. There was also the principle of effectiveness, to gain the maximum effect with the amount of effort the researcher had at her / his disposal. However, there was a danger that the research could be over-influenced by the researcher's own bias towards a particular range of issues. Action was taken to alleviate this danger through utilising three procedures: The use of a Delphi group, relating the research back to the literature review and support from the tutor.

This section aims to link the summarised sections within the literature review with issues that have emerged from case study 1. The summarised sections

from the literature review appear as italicised script. These are then referenced against findings from case study 1, which are recorded in appendix 2.1, 2.2 and 2.3.

*Design and technology has a link with lower ability pupils through its historical association with Elementary and Secondary Modern schools and its ability to offer opportunities for learning by direct experience, through a medium of expression other than the written word*

The Newsome Report, (1963), discussed education for “pupils of average and less than average ability”. The report underlined the value of practical activities to these pupils. From the focussing data an historical link between design and technology and lower ability pupils could not be proven or disproved. T3 states, (para. 47) that he felt the practical nature of the subject resonated with the future career aspirations of the pupils. However, it was evident that the subject offered many opportunities for learning through a medium of expression other than the written word, (see para. 13, 19, 33, 45, 47).

*Design and technology has a link with knowledge that has a perceived lower status; practical being perceived as the opposite to academic*

The Crowther Report, (1959) discussed bridging the gap between education and industry. The Report attempted to change people’s perception of the word “practical” as meaning the opposite to “academic”. This group of pupils are not “academic”, (see group profile). Many of the group are disaffected and are anti-school and anti-academic. T2 states, “Getting a good mark for an essay isn’t cool but making a good job (i.e. realising a piece of practical work) is.” The fact that the subject may be perceived as lower in status, practical as opposed to academic, could be a factor in engaging these pupils in learning. However, an individual may well be anti-academic, but that does not, automatically, make them pro-practical. There appears to be a relationship, but it is neither simple nor bi-polar.

*Pupils enjoy doing practical work, and making activities develop skills over and above those required to complete a specific task*

In the literature, several key features emerged that were identified with design and technology: designing and making, (DES, 1988, para.1.42-1.43), practical activities, (Tyers, 1998, Brochocka *et al*, 2001). From the observations and subsequent interviews it is evident that there are designing and making activities taking place, (see para. 15, 37). The significance of the practical activities is also identified, (see para.11, 13, 21, 33, 47, 53, 54). These preliminary findings resonate with Brochocka *et al*, (2001:23-29), Tyers, (1998) and Tufnell *et al*, (1997:226 –227) who found that practical activities had considerable learning and motivational potential. Atkinson, (1993:17 –25) identified a series of design tasks that de-motivated some pupils; this too mirrors the researcher's experience. The paper-based activities are more challenging to engage the pupils in learning, (see para. 37, 47). However, in case study 1, the observers noted that the pupils were less reluctant to engage in non-practical activities in design and technology than they were in other subjects, (see para. 31, 37, 45, 47, 49,).

*Pupils in the literature review had a low perception of the “usefulness / relevance” of design and technology*

Atkinson, (1993:17 –25), identifies in her sample a growing lack of enthusiasm for the subject amongst Key Stage 4 pupils. There is considerable consensus on the issue of pupils' perceptions of the relevance of design and technology. Brochocka *et al*, (2001:23-29) Growney, (1996:75-79), and Atkinson, (1993:17 –25), all found that the pupils had a low perception of the subject in terms of its usefulness in later life. “Usefulness” in these contexts can be defined as developing skills for future employment.

From the observations and subsequent interviews it was clear that the observers and pupils had a positive perception of the relevance of the subject, (see para. 21, 47, and interview with pupils: “In D&T you can have a laugh and the lessons are interesting, you can see what you are doing. In D&T the

teachers are interested in us and talk to us about things outside school. I like doing practical subjects because it's like having a proper job – using tools and machines and stuff. In some subjects like history all you do is talk and write... In design and technology you get treated like an adult, you get to do things, use machines and make things”). There appears to be a difference in the way the pupils at this school perceive the relevance of the subject compared to the evidence gleaned in the literature. Brochocka *et al*, (2001:23-29) Gowney, (1996:75-79), and Atkinson, (1993:17 –25) all record specific details regarding the size of samples used. However, they do not indicate the ability of their samples. The absence of an ability label would suggest that the samples were mixed ability. Their samples could contain pupils from across the ability range as opposed to this research, which is focussed on low ability pupils. Whilst the potential reasons for these differences are acknowledged, the issue needs further research into what factors contribute to the difference in perception.

*Design and technology teachers can sometimes be perceived as different to other teachers due to their historical development, their educational backgrounds and the nature of the subject*

Wellbourne-Wood, (1999:195-199) gives an ethnographic account of the routines and rituals of design and technology classrooms in Australia. His account resonates closely with my own experience. Design and technology Staff are described as “shed men”. However the term is used, it carries with it a powerful image, inextricably linked to status. Hansen, (2000:85 – 89) discusses the “Learning preferences and tendencies of Canadian technological teachers”. Technology teachers tend to adopt a more practical perspective. Hansen *et al*, (1992) comment that some technology teachers experience a dissonance between value systems; school managers perceive the values and beliefs about learning held by technology teachers as being unimportant. The values and beliefs held by technology teachers are developed through a more experiential model of learning as opposed to a traditional academic route.

The data collected in the observations and interviews indicated that there

were positive relationships between design and technology staff and pupils, (see para. 33, 39,40, 47, and the interview with the pupils: “In D&T the teachers are interested in us and talk to us about things outside school. You get treated like an adult, you get to do things, use machines and make things”. How the pupils perceived the design and technology staff was a contributory factor in developing a positive relationship. To what extent this perception is different, and whether or not it is due to the historical development of the subject or the educational backgrounds of the staff would need further exploration.

*Design and technology’s, (or similar activity based work such as Sloyd, craft, metalwork, industrial arts etc) contribution to a child’s general education has been recognised since the time of the early educational philosophers. Design and technology offers a wide range of learning opportunities to pupils of all abilities*

Recognition of the educational value of the subject can be traced to early educational thinkers such as Rousseau, Pestalozzi, Herbart and Froebel. All acknowledged the contribution that practical subjects could bring to a child’s education. Rousseau’s general principle in Emile’s education was to teach to learn by doing. (Rousseau, 1780, Dodd, 1978:8).

There are many examples in the observations and interviews that support this statement, (see para. 45, 47, 49, 54.). The subject offers a wide range of learning opportunities that are acknowledged by the observers. Could the subject be developed to provide a suite of qualifications – in key skills as well as a range of more practical subjects? Some vocational qualifications are already suited to provide a double award, (2 GCSEs) or even a quadruple award, (4 GCSEs).

*Design and technology directs pupils to be active participants as opposed to passive recipients. Design and technology can transform the pupil from being a passive recipient to becoming an active participant - the difference in studying technology to becoming a technologist. The subject utilises the inter-*

*relationship between conceptual knowledge and procedural skills. A move away from “hand me down” outcomes and truths to one in which our own truth is generated, (Kimbell, 1997:47).*

Active participation was encouraged in design and technology, (see para. 13, 33, 49, 54 and in the interview with the pupils; “I like doing practical subjects because it’s like having a proper job – using tools and machines and stuff.”). The observations supported this claim in the literature. How significant is the level of participation? What is the relationship between participation in a lesson and engagement in learning?

*Low ability pupils have increased in significance and status due to schools becoming more accountable*

*The term “Low Ability” falls within the spectrum covered by the term “Special Educational Needs”. This encompasses learning problems, emotional and behavioural difficulties, and physical disabilities.*

Using the data from the group profile, (appendix 1.1) it was evident that the majority of this group fell into the category of low ability. 1005 had a reading age of almost two years lower than his chronological age. According to the test he was the best reader in the group. The data collected in the clarifying interviews supported this claim, (See 3,19,26,42,51,56).

*Relevance has always been a key factor in engaging pupils in learning. Children have always learned a great deal from their parents, their environment and peers. Historically, students learned from teachers or apprentice masters who told and showed the students in the same way as they themselves had been taught as students or apprentices. A key to this system was the issue of relevance. Students needed to learn to survive, to execute a particular task, to become a member of a particular group. The advent of a specialist school environment to facilitate learning removed the direct relevance and immediacy that existed in previous contexts, (Bigge, 1988:5).*

The data gained from the observations and interviews appeared to support this claim. See the discussion on relevance above.

*A learning theory supports implicitly or explicitly how a teacher promotes learning.*

*A theory of learning has, by implication, a set of classroom practices. In this way a learning theory could be used as an analytical tool to judge the quality of a particular classroom situation.*

*A learning style is believed to be a preference towards a particular form of learning*

The data gathered in the observations and interviews were not focussed on the above issues. These issues are inevitably significant. However, the observers and the researcher did not identify learning issues as being significant in terms of the remit to which they were working.

*Learning can accompany everything that we do*

*Engagement in learning can operate at many levels*

In their essay, *Schools as knowledge-building organizations*, Scardamalia and Bereiter, (1999:274) suggest that learning accompanies everything that we do. They develop a distinction between being engaged in learning and being engaged in a learning activity. Drawing on research by Ng (1991) engagement can appear in many forms.

Learning is a broad concept. For the purpose of this research a simple definition of the term was used. Measurement of the depth of engagement was not a feature as it would be too problematic to assess. Pupils were perceived to be engaged in learning unless there was evidence to the contrary. The evidence will range from passive disinterest to active disruptive behaviour.

The data from the observations supported Scardamalia and Bereiter's, (1999:274) broad definition of learning. T3 observed the acquisition of "social skills", "behavioural progress", (see para. 49, 58). These were the wider skills that class members were learning; skills that did not appear in a lesson plan or in a scheme of work.

The simple interpretation of "engagement in learning" resonated with the observers' comments. T2 observed engagement through pupils helping each other through there being less "winding up" and through improved attendance, (see para 29, 31, 35,). T3 also observed engagement through helping each other, high participation and through better behaviour in design and technology lessons, (see para 54, 58,).

*Disaffection - is generally accepted as a term applied to pupils who have become disengaged from the education system, and who are not gaining a positive experience of life at school*

The interview with the pupils provided evidence to suggest that many of the group were not gaining a positive experience of school. "In some subjects they treat us like shit, in RE we get shouted at from the time we get into the classroom. I hate doing Welsh – I would never pick Welsh as a subject but the school makes you do it. In some lessons we don't get a chance - we get shouted at as soon as we go in. Every one tells us to do COEAs (Certificate of Educational Achievement – see glossary) and treats us like little kids. We never get the good teachers we always get the ones who are on supply and who don't come back next week."

*Disaffection has a substantial price tag*

This issue was not investigated in the observations and interviews.

*Four strands of disaffection are identified: school is not perceived as being relevant, pupils needed activities that were practical involving adults other than teachers; pupils had developed a negative relationship with the school;*

*many of the pupils had problems with relationships at home or at school or in a peer context; and, schooling reinforces a view of the pupils as being not worthy and dismantles their self-esteem*

There is evidence from this focussing study to suggest that design and technology at this school was addressing many of the issues that are identified in the strands:

*School is not perceived as being relevant* - The subject was being communicated to the pupils as something that was relevant, (See para. 11, 21, 37, 47, 53)

*The pupils needed activities that were practical* –design and technology at this school was a practical, hands on subject, (See para. 11, 13, 33, 37, 53)

*Involving adults other than teachers* – Is the image of design and technology teachers as portrayed by Hansen, (2000) and Wellbourne-Wood, (1999) a factor in developing positive relationships with the disaffected?

*The pupils had developed negative relationships...* The department develops positive relationships with the pupils. (See para. 8, 11, 13, 17, 29, 33, 40, 47, 54)

*Many of the pupils had “something else” happening in their lives – problems from relationships at home or at school or in a peer context.* There was evidence from the class profile that many of the pupils in this group had relationship problems or problems in terms of measurable academic performance – reading ages, GCSE targets. (See para. 3, 29, 35, 42, 51)

*Schooling reinforces a view of the pupils as being not worthy and dismantles their self-esteem.* The clarifying interviews suggested that the design and technology department worked to develop self-esteem, (See para.11, 13, 19, 56)

*There is a strong connection between motivation and learning*

*Three forms of motivation have been identified - intrinsic motivation, extrinsic motivation and expectation of success; design and technology offers many opportunities to satisfy these forms of motivation*

The literature suggests that there is a strong connection between motivation and learning. (See Winch and Gingell, (1999:150) Pollard and Triggs, (1997:245) Geen, (2001:34), (1991 and 1997). Good and Brophy, (1987) identify three forms of motivation - intrinsic motivation, extrinsic motivation and expectation of success. There appeared to be opportunities to satisfy all these forms of motivation in the design and technology lessons observed. The evidence gathered suggested that these pupils are motivated, (see para. 19, 37, 56). It would be naïve to presume that the same factors motivated each member of the group. The task must be to identify those factors that encourage engagement for the majority of the group. What factors contribute towards creating this climate of motivation? What factors could contribute towards creating a climate of de-motivation?

*The context of where the learning takes place is significant*

The interviews and observations were all based in a workshop situation. There was insufficient data to make a valid comment on the significance of the context of where the learning was taking place.

*Teaching is a polymorphous concept; it is not just one activity. The term teaching encompasses a large number of strategies*

There was evidence of a social constructivist approach to teaching. A social constructivist perspective stresses the importance of scaffolding to guide and support the pupil's participation in activities and the interdependence of the pupil with other pupils and adults. Cox, (1995) comments that scaffolding allows the adult to control sufficient elements of an activity to enable a pupil to achieve the requisite skill or understanding, and then progressively remove the support so that the pupil can function autonomously. Examples of this

approach were the use of exemplar material, (15,21,37) and the high tolerance of making mistakes, (11,13,19)

Many teaching strategies are used in the lessons observed, (see, para. 8, 11, 13, 23, 47, 49). Another possible avenue for further research would be to establish which teaching strategies were most effective / least effective with this group? What could be done to make the least effective strategies more effective?

*The relationship between pupil and teacher is changing to reflect changes that are occurring in school and in society at large*

*The quality of the teacher / pupil relationship can be a significant factor in pupils being engaged in learning*

Berliner, (1983) argues that what the teacher does is teaching for historical reasons. The activity could better be described as managing learning experiences; ensuring that pupils are engaged in learning and making appropriate progress. Carl Rogers, (1998:196 -208), also rejects the traditional concept of the teacher and develops the notion of being a facilitator of learning. He believes, (1998:197) that “significant learning rests upon certain attitudinal qualities that exist in the personal relationship between the facilitator and the learner”.

The issues of teacher / pupil relationships and pupil / pupil relationships emerged frequently in the observations and interviews. The interview with the pupils recorded that: “In D&T the teachers are interested in us and talk to us about things outside school. You get treated like an adult”. This contrasted starkly to comments made about relationships between teachers and pupils in other subjects at this school: “In some subjects they treat us like shit... In some lessons we don’t get a chance - we get shouted at as soon as we go in...Every one tells us to do COEAs and treats us like little kids.” There was evidence of positive relationships between teachers and pupils in design and technology lessons.

The interviews with the observation group also supported this view, (see para. 8, 13, 26, 33, 40, 54,). “Perhaps one of my most encouraging observations was to see them helping each other without being asked to do so.... It’s like I said about the fair treatment. The design and technology staff seem to be fairly consistent – compared to some staff. The kids know where they are with you and that helps a lot to stop blow-ups from happening.”

There was potential for further research in the area of relationships. What strategies are used to develop positive pupil teacher relationships? Are some strategies more effective than others?

#### **4.7 Conclusion and focussing of future research**

There were many instances where the literature strongly matched the findings of the focussing case studies. Many factors were identified as being significant: the quality of relationships, the relevance and practical nature of the subject, developing self-esteem and confidence, improving social skills and behaviour, timing and lesson management, use of exemplar work, group work, and options / compulsory subjects. All of these identified factors may have the potential to motivate disaffected and low ability pupils to engage in learning. These factors resonated with the literature review and were assumed, therefore, to be of low priority for further research.

However, there were some notable themes that appeared not to match. The issue of perceived relevance stands out as being particularly prominent. The literature found that pupils had a low perception of the relevance of design and technology. The data gathered at the school appeared to show the subject as being perceived as positively relevant. There appeared to be a dissonance with the literature.

The next phase of the research will be a case study to explore the pupils’ perception of the term “relevant”. The aim of the case study will be to establish a shared understanding of the term “relevance”.

## **Chapter 5 - Case study 2**

### **Exploring disaffected pupils' perceptions of the relevance of design and technology: a case study with a group of pupils aged between 14 and 16, Key Stage 4**

*This chapter describes a case study carried out to establish disaffected and low ability pupils' perception of the term "relevant" with particular reference to design and technology. A semi-structured interview schedule was developed to assess the perceptions of the pupils. The findings suggest that the pupils have a dual understanding; "relevant": in terms of present / situational and "relevant": in terms of preparation for a particular purpose. The group of pupils in this research would be low in emotional intelligence and would be expected to find difficulty in delaying gratification. "Relevant " is perceived by them more in terms of present / situational. The next phase of the research focuses on how a positive perception of relevance in design and technology is promoted at this school.*

#### **5.1 Introduction**

This section describes a case study carried out to establish disaffected and low ability pupils' perception of the term "relevance" with particular reference to design and technology. The sample is 30 pupils made up from year 10 and year 11 low ability / disaffected groups. Discussion of the relationship between pupils' perceived relevance of an activity and their levels of engagement appear frequently on the UK educational agenda, (Ofsted 2005:51-52, Davies *et al*, 2004:147, Daniels *et al* 1998:5.5, Denton, 1992). Initial research suggested that pupils in the focus group at this school had a very positive perception of the "relevance" of design and technology. In contrast the literature reviewed suggested that pupils in their samples had a low perception of the "relevance " of design and technology. The findings of this case study suggest a dual understanding "relevance": in terms of present / situational and in terms of preparation for a particular purpose. The group of pupils in this research were of low ability and would find difficulty in delaying gratification.

“Relevance “ is perceived by them more in terms of present / situational. This may be of significance to educational practitioners and other stakeholders.

This section presents a summary of the background to the work, the methodology employed is explained, results presented and then discussed. Finally conclusions are drawn relating to design and technology in general and how this action research project will develop.

## **5.2 Background**

Earlier research developed an understanding of the term “engaged in learning”. In their essay, *Schools as knowledge-building organizations*, Scardamalia and Bereiter, (1999:274) suggest that learning accompanies everything that we do. They develop a distinction between being engaged in learning and being engaged in a learning activity. Measurement of the depth of engagement will not be a feature as it will be too problematic to assess. Pupils will be perceived to be engaged in learning unless there is evidence to the contrary. The evidence will range from passive disinterest to active disruptive behaviour.

Case study 1 identified a range of factors that contributed to pupils being engaged in learning in design and technology: the quality of teacher pupil relationships, high expectations, and the practical nature of the subject. These factors were then reviewed in relationship with the relevant literature. Many of these factors resonated with findings in the literature. (*Rogers, 1998:196 –208, Brochocka et al, 2001:23-29, Tufnell et al, 1997:226 –227, Pollard and Triggs, 1997:245 and Geen, 2001:34*). However, there were indications from staff interaction with the group that they saw their design and technology work as “relevant”. This appeared to conflict with research undertaken by Brochocka et al (2001:23-29), Growney, (1996:75-79), and Atkinson, (1993:17 –25). These researchers found that pupils in their samples did not perceive design and technology as being relevant.

The literature (Cambridge Advanced Learner's Dictionary 2003) defines 'relevant' in two ways: firstly, connected with what is happening or being discussed, secondly correct or suitable for a particular purpose. The first is connected to the present; it is situational, whilst the second connects more with preparation for a particular purpose. A pupil could interpret a lesson's relevance in either way. For example, they might perceive discussing appropriate constructional techniques for a project as relevant in a situational context but not relevant to their future aspirations. Or, they might perceive a lesson on product analysis as not relevant to their particular immediate situation but could concede that the exercise would be relevant if they were to buy a particular product in later life.

### **5.3 Methodology**

Exploring the target group's perceptions of relevance would not be straightforward. Disaffected and low ability adolescent pupils tend to react poorly to questionnaire type surveys based on the written word. In addition, as a teacher researcher, one's presence may influence pupil responses, (Hammersley, 1993:219). To alleviate this problem a semi-structured interview approach was adopted (Cohen *et al* 2000:245). This was developed in such a way that the special needs coordinator (SENCO) could administer it. The pupils knew this teacher, they had good verbal communications established and yet the teacher was not seen as 'belonging' to any specific subject area.

The interview schedule was required to measure pupil understanding of the term "relevance" and to gain data on what they perceived as a relevant subject. It is acknowledged that collecting data from other subjects could be ethically contentious. However, all staff were aware that action research was ongoing based on a theme of engaging pupils in learning. Other subjects had to be included to establish a benchmark. This data needed to be in a form that would be readily analysed, (Wilson and McLean, 1994:5). The use of a semi-structured interview addressed both of these issues.

In order to triangulate data the researcher had established a Delphi group (Toffler, 1970:462) within the design and technology department. The group members were used to give feedback in the traditional Delphi sense and also assisted in gathering data through informal interviews with the pupils. The Delphi group met, pooled their findings and generated two broad interpretations of the term “relevant” that resonated with the definitions above. For the first, *connected to the present, situational*, the group gave; “relevant to what was happening at the time, understanding the aims and context of the lesson; because relationships were positive; experiences in the lesson were positive / enjoyable; it was tangible, you could see what you were achieving and could understand why you were being asked to do something”. For the second interpretation; *preparation for a particular purpose*, the group gave, “relevant in terms of future employment, of use in some way in your future life”.

The list of subjects was selected by timetable analysis. All the pupils studied English, mathematics, science and design and technology. Every pupil took compulsory Welsh, religious education and physical education. However, to limit the list to 7 subjects could have made the exercise too pointed towards design and technology; to include every subject studied by all the pupils would have created a list of 16 subjects. The compromise was to include music, engineering, history and information communication technology. These were selected because a substantial percentage, over 50% of the sample, was studying the subjects in KS 4. The data collected from these subjects could be of professional interest but comparisons could not be drawn between these subjects and the subjects that every pupil studied.

A battery of statements was established using simple language. Pupils were asked to assess the level of their agreement with these interpretations of the term “relevant” using a rating scale. Rating scales offer a flexible response and the ability to offer frequencies, correlations and other forms of quantitative analysis. The scale selected was a 6- point version of the Likert, (1932) rating scale ranging from 6 very strongly agree to 1 very strongly disagree. The flexibility of a semi-structured interview enabled the researcher to add supplementary questions to clarify issues. The pupils were encouraged to add

observations they felt were appropriate but not covered by the schedule. These would be recorded as qualitative data.

The format of the semi-structured interview needed to be user friendly. The group of pupils at the centre of the research were particularly sensitive to 'wordiness' and to being patronised. The solution was to word the statements as simply and briefly as possible. The SENCO checked the statements for their readability and then developed a more detailed script. She would read through the statements with each group, and amplify each from her more detailed script. The target groups were; a group of 16 pupils in year 11 and a group of 14 pupils in year 10. Cohen *et al*, (2000:258) emphasises the need for clarity, for short unambiguous instructions to support each section of the semi-structured interview.

This first draft of the interview was then re-circulated to the Delphi group as a further check. The group identified the "relevant because you like the teacher / like the subject categories as potentially contentious. A lesson could be relevant yet not liked, not enjoyable. After reflection it appears that the response to this question may depend on the pupils' dominant perception of relevance. If the pupil favours the definition *preparation for a particular purpose* then it is possible that the pupil could perceive relevance in a lesson that was not enjoyable. The pupil has the ability to delay gratification. However, if the pupil favours the other definition *connected to the present, situational*, it would be less likely that the pupil has the ability to perceive relevance in a lesson that is not enjoyable for that pupil. The pupil has little ability to delay gratification. The context of the lesson, the quality of the teacher/pupil relationship, the pupil's perceptions of being in the lesson are all situational. It was decided to retain both the categories, and to develop questions on what subjects the pupils perceived as being relevant and what subjects' pupils enjoyed.

Overleaf in table 5a is a copy of part of the modified and augmented schedule.

Ex1 and 2 are examples to show pupils how the questions work:

Table 5a	Task 1	6	5	4	3	2	1
Ex1	Rap music is the best		*				
Ex2	There should be more football on the TV			*			
	<b>A subject is relevant when</b>						
<b>A</b>	The subject is useful to know about now, <i>at this moment, when you are doing the subject you think that it is useful as you are doing it, if you agree really strongly then tick box 6, if you agree tick box 4, if you disagree tick box 3 and really disagree tick box 1.</i>						
<b>B</b>	The subject is interesting, <i>the subject isn't boring, you are interested in what is going on in the lesson, you are not bored by what the teacher is telling you or by the work that you are doing</i>						

The researcher / Head of Department carried out a pilot of the semi-structured interview with a year 10 mixed ability group who were not involved in the research. This is reported in appendix 1.6. This aimed to establish the effectiveness of the interview in terms of:

- The use of language
- The extent to which the children understood the questions / statements
- The quality of responses in terms of the research questions

It became apparent that the pilot group was unhappy about doing the task.

This manifested itself in several ways: some appeared puzzled by the first group of questions and could not make a response and there was some low level disruption. It was decided to stop the task after less than 10 minutes.

The researcher was convinced that the task, as it was being administered at this stage, would not yield useful data. He drew a 6-point chart on the board and asked the class if they had understood the scoring system. They agreed unanimously that they had understood. He then asked the class for a group response to question 1A. This provoked a useful debate within the class:

*“Yeah, Science - like when you work something out doing an experiment...finding out stuff on the internet...why World War One started”*

The class then showed hands for the various categories recorded in Table 5b.

Table 5b	The subject is useful to know about now, <i>at this moment, when you are doing the subject you think that it is useful as you are doing it, if you agree really strongly then tick box 6, if you agree tick box 4, if you disagree tick box 3 and really disagree tick box 1.</i>	6	5	4	3	2	1
1A		7	5	5	2	0	1

Conducting the schedule in this way would have advantages. Useful comments would be gained in addition to quantitative data. However, the exercise would be time consuming, and the comments could influence pupils' responses. The most effective compromise appeared to be for the pupils to carry out the task in groups of 2 or 3.

A factor in the success of the pilot interview was reacting to the pupils' initial negativity towards the task. Ball, (1990:157-171) comments that to establish a rapport with the participants is critical. Bird *et al*, (1996:90), emphasises the interviewer developing skills of reflection, observation, listening and recording. The author would add "reacting" as another essential skill, i.e. critical awareness of what is happening and the confidence to make amendments to the original plan.

#### **5.4 Findings and discussion form the semi-structured interviews carried out by the SENCO**

The aim of the interview was to discover:

- How pupils at this school understand the word relevant
- Which interpretation the pupils favour
- As a result of these interpretations and understandings, what subjects do the pupils perceive as being relevant?

The data from the semi-structured interview was collated and the findings are presented in Tables and Figures. Table 5c offers a record of responses that address the question: *a school subject is relevant when?* Figure 5d presents the information in graphical form.

**Table 5c - A school subject is relevant when**

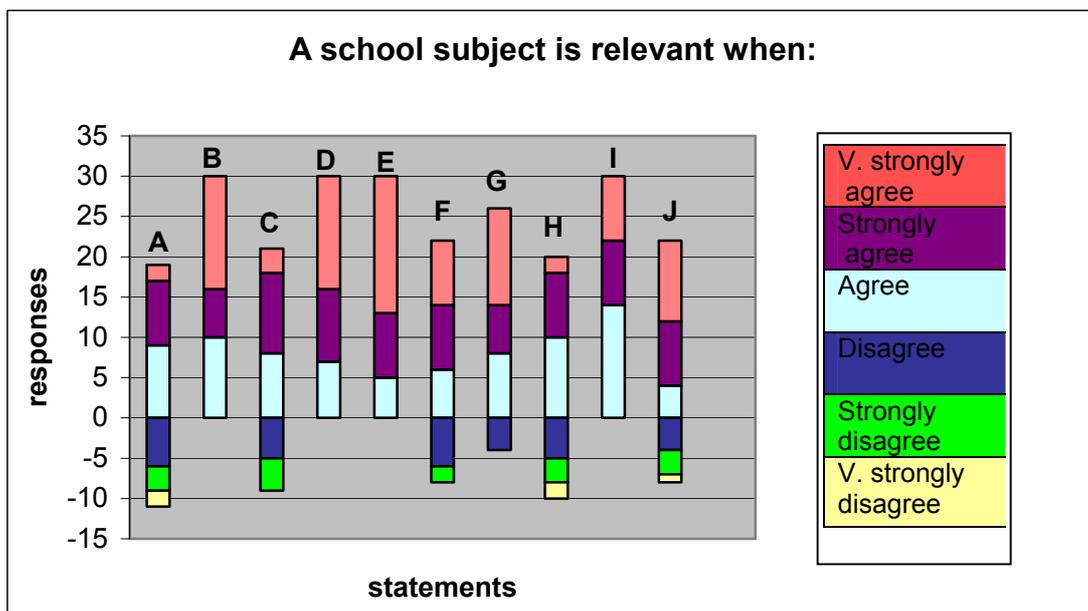
6 very strongly agree

1 very strongly disagree

	<b>Task 1</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>A</b>	The subject is useful to know about now	2	8	9	6	3	2
<b>B</b>	The subject is interesting	14	6	10			
<b>C</b>	You can see what you are doing	3	10	8	5	4	
<b>D</b>	You understand what you are doing	14	9	7			
<b>E</b>	You like the subject	17	8	5			
<b>F</b>	The subject is useful to help me in a job I might get when I leave school	8	8	6	6	2	
<b>G</b>	The time goes quickly	12	6	8	4		
<b>H</b>	You learn a lot	2	8	10	5	3	2
<b>I</b>	You like the teacher	8	8	14			
<b>J</b>	The subject could be useful to me at some time in the future	10	8	4	4	3	1
<b>K</b>	Can any one think of any other ways a subject could be relevant?	*					

\*3 made written / verbal responses - *Make the subject more practical, make lesson shorter, have a better system of rewards – gift vouchers / allowed to play computer games if work is completed to a high standard*

**Figure 5d - A school subject is relevant when**



## Discussion

The pupils subscribed to both understandings of the term “relevant”. The majority of pupils recorded agreement with both definitions in all the categories.

### Which interpretation do the pupils favour?

This group favoured the first definition: *“relevant” is connected to the present; it is situational*. The strongest agreement came in categories B, D, E and I. All saw a subject as relevant if it was interesting, if you could understand what you are doing, if you liked the subject and if you liked the teacher. The categories that were connected to the second definition: *preparation for a particular purpose* did not record a similar consensus. At least a quarter of the pupils disagreed with categories A, F, H and J – useful to know about now, to get a job, you learn a lot and to be of some use in the future.

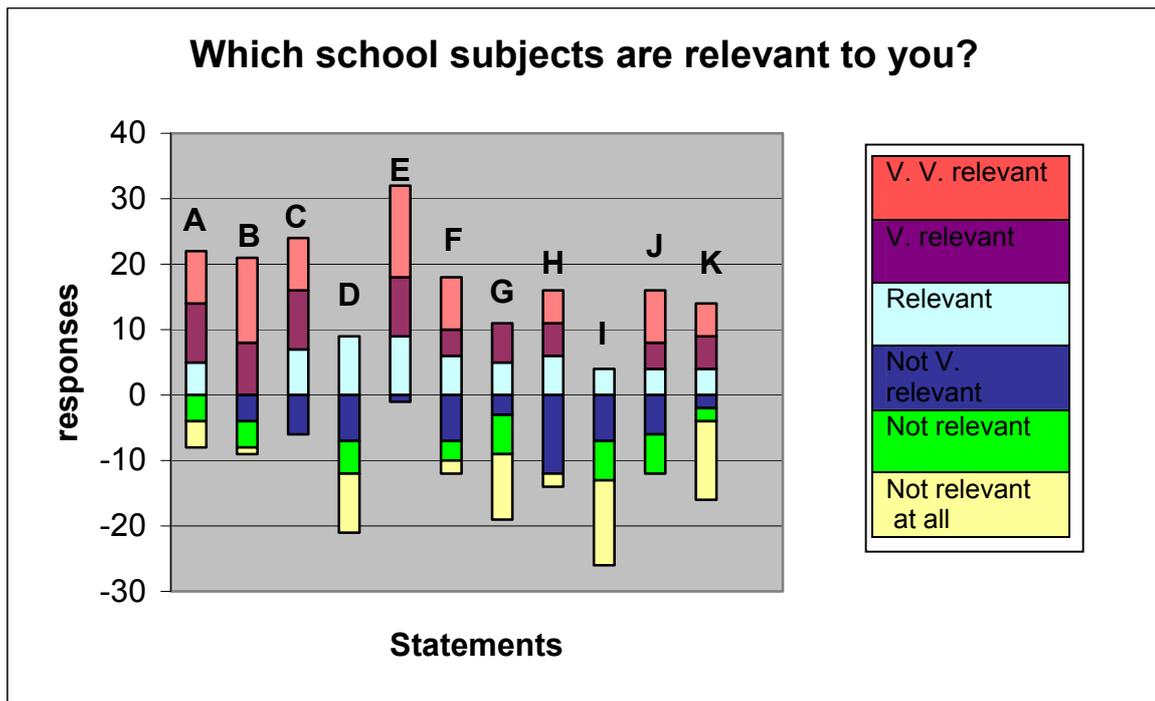
Perceiving something as being relevant to a future career could be a connection that would be difficult for low ability pupils to make. Goleman, (1996:83) and Mischel, (“The Marshmallow Test” 1989), support this claim. Mischel found that pupils who could delay gratification, who could make a connection between their present situation and future reward, succeeded at academic activities. Dobbs, Dodgson and Craddock, (2004:15) develop the theme in their research. They conclude that young people are heavily influenced by youth culture and celebrity culture with its emphasis on instant gratification. Contemporary sociological thinking also appears to support this line of reasoning. Campbell’s theories of consumerism (1995) are used as the basis of a lecture on contemporary youth culture, ([www.socialsciences.man.ac.uk](http://www.socialsciences.man.ac.uk), accessed 15/6/05). “There was a new emphasis on immediate gratification: people were keen to indulge themselves, to have fun”.

Table 5e offers a record of responses that address the question: *Which subjects do you think are relevant to you?* Figure 5f presents the information in graphical form.

**Table 5e - Which subjects do you think are relevant to you?**

	<b>Task 2</b>	Very, very relevant 6	5	4	3	2	Not relevant at all 1
<b>A</b>	English	8	9	5		-4	-4
<b>B</b>	Maths	13	8		-4	-4	-1
<b>C</b>	Science	8	9	7	-6		
<b>D</b>	RE			9	-7	-5	-9
<b>E</b>	Design and technology	14	9	6	-1		
<b>F</b>	PE	8	4	6	-7	-3	-2
<b>G</b>	Welsh		6	5	-3	-6	-10
<b>H</b>	ICT	5	5	6	-12		-2
<b>I</b>	History			4	-7	-6	-13
<b>J</b>	Engineering	8	4	4	-6	-6	-2
<b>K</b>	Music	5	5	4	-2	-2	-12

**Figure 5f - Which subjects do you think are relevant to you?**



**As a result of these interpretations and understandings what subjects do the pupils perceive as being relevant?**

In Task 2 the pupils were asked to indicate which subjects they saw as relevant to them. The task was further clarified by the SENCO to encompass both definitions. Design and technology was perceived by 29 out of 30 of this group as being relevant, very relevant or very, very relevant. Only one pupil perceived the subject as being not relevant. This can be compared with the core subjects of English, Mathematics and Science where 8, 9 and 6 pupils respectively did not have a positive relevant perception of these subjects. The perception of the pupils towards the relevance of RE and Welsh, both compulsory subjects, accurately reflects interview data gathered earlier. The pupils said that they did not see the relevance of these subjects and resented being made to take them. Design and technology is still a compulsory subject for most pupils in English schools. It is possible that resentment towards “the compulsory” nature of a subject may be a factor in the negative perception of the subject reported in the literature. The pupils in this research had all opted to take design and technology.

Research by Biddulph and Adey, (2004) appears to support the responses made regarding the lack of perceived relevance in History. They focussed on Key Stage 3 and use Year 8 as their target group. Most pupils were unable to explain in what ways the subject was useful. Some dismissed the subject as “irrelevant”. Many saw a relevance only in relation to possible future careers. Biddulph and Adey (ibid) found the main subject content per se does not shape pupils' attitudes to history and geography. The teaching and learning activities employed were far more influential.

The findings in this task support the claim that pupils at this school perceive design and technology lessons as being relevant. Brochocka *et al*, (2001:23-29) Growney, (1996:75-79), and Atkinson, (1993:17 –25), all focussed on relevance in terms of the second definition. They found that pupils in their samples did not perceive design and technology as being relevant. There may be other factors that contribute to the difference in response such as career

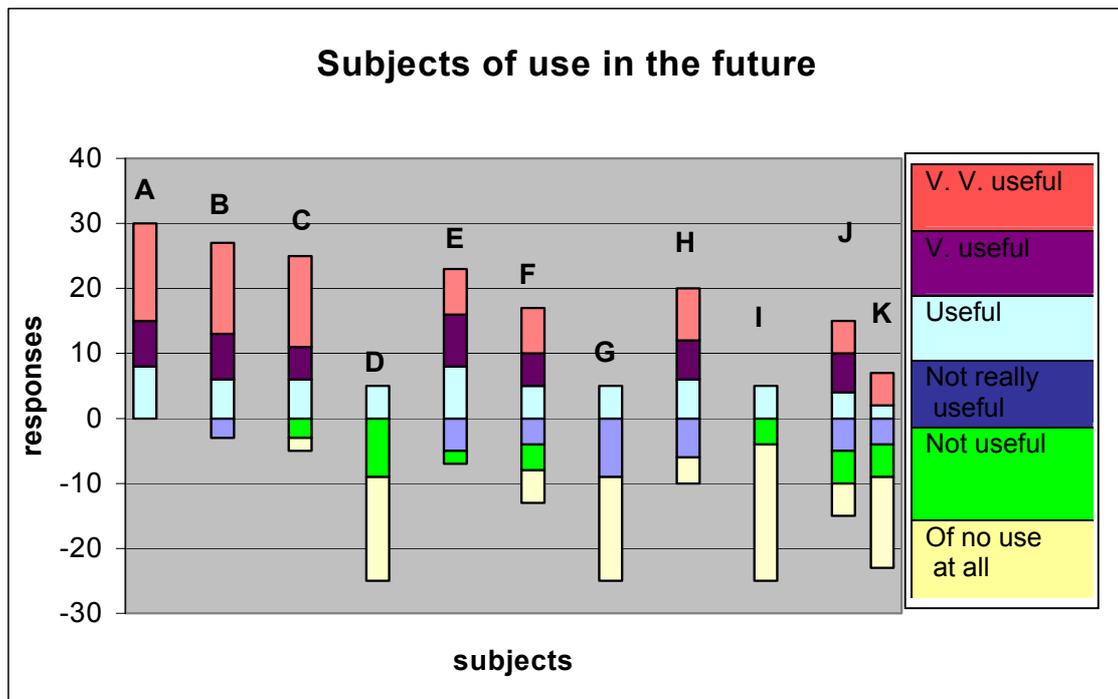
aspiration, sociological composition and ability range of the samples. Davies *et al*, (2004:147) identify perceived relevance as a key factor in motivating pupils with emotional, behavioural and social difficulties to engage in learning. In “good” lessons learning was contextualised and utilised the pupils known interests.

Table 5g offers a record of responses that address the question: *Which subject do you think will be of use to you in the future?* Figure 5h presents the information in graphical form.

**Table 5g - Which subject do you think will be of use to you in the future?**

		Very, very useful			of no use at all		
<b>Task 3</b>		<b>6</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>A</b>	English	15	7	8			
<b>B</b>	Maths	14	7	6	3		
<b>C</b>	Science	14	5	6		3	2
<b>D</b>	RE			5		9	16
<b>E</b>	Design and technology	7	8	8	5	2	
<b>F</b>	PE	7	5	5	4	4	5
<b>G</b>	Welsh			5	9		16
<b>H</b>	ICT	8	6	6	6		4
<b>I</b>	History			5		4	21
<b>J</b>	Engineering	5	6	4	5	5	5
<b>K</b>	Music	5		2	4	5	14

**Figure 5h - Which subject do you think will be of use to you in the future?**



Task 3 asked which subjects would be of use to the pupils in the future. This explored relevance in terms of - *preparation for a particular purpose*. English, Mathematics and Science recorded the highest results. The fourth largest agreement, 23 pupils, perceived design and technology as being of use to them in the future. This was further clarified in a follow up informal interview. The group were asked about their career aspirations. A corresponding number of pupils indicated that they were interested in a trade related career, (brick layer, carpenter, plumber, roofer, agriculture, car mechanic, and some form of engineering). This raises the issue of the relationship of the subject content as laid down by the National Curriculum and examination boards and the aspects these pupils see as relevant.

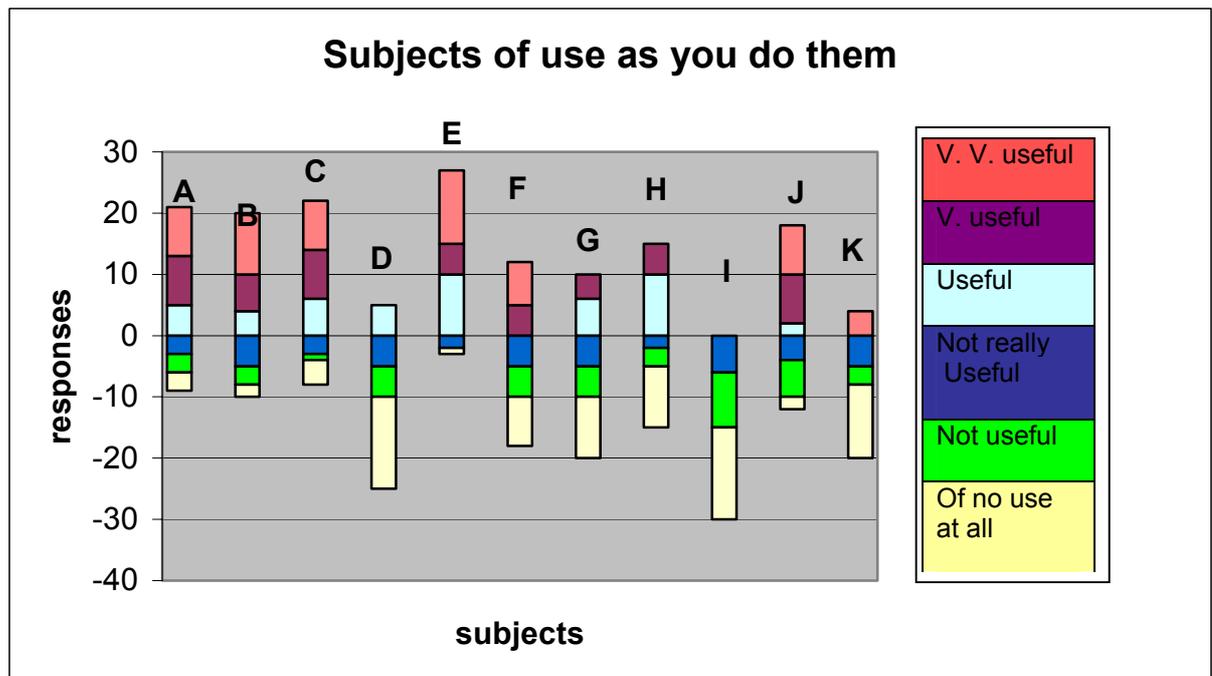
There is a distinct sociological contrast between the context of this research and the research carried out by Brochocka *et al*, (2001:23-29) and Growney, (1996:75-79). Their research appears to be located in a more middle class context. Brochocka *et al*, (2001:26) reported that design and technology did not feature as a “most important” subject. Growney, (1996:78) found that pupils perceived the subject as “narrowly vocational, for crafts and blue collar jobs” It would be easier for pupils with aspirations to follow a career in a trade related career to perceive design and technology as being relevant. Atkinson, (1993:19 –20) found that only 10% (n179) of the pupils perceived the subject – design and realisation – as being useful to them in the future.

Table 5i offers a record of responses that address the question: *Which school subjects do you find useful now as you are doing them?* Figure 5h presents the information in graphical form.

**Table 5i - Which school subjects do you find useful now as you are doing them?**

Task 4		Very, very useful ↓			of no use at all ↓		
		6	5	4	3	2	1
<b>A</b>	English	8	8	5	3	3	3
<b>B</b>	Maths	10	6	4	5	3	2
<b>C</b>	Science	8	8	6	3	1	4
<b>D</b>	RE			5	5	5	15
<b>E</b>	Design and technology	12	5	10	2		1
<b>F</b>	PE	7	5		5	5	8
<b>G</b>	Welsh		4	6	5	5	10
<b>H</b>	ICT		5	10	2	3	10
<b>I</b>	History				6	9	15
<b>J</b>	Engineering	8	8	2	4	6	2
<b>K</b>	Music	4	6		5	3	12

**Figure 5j - Which school subjects do you find useful now as you are doing them?**



Task 4 focused on what subjects' pupils found useful as they were doing them. The task was further explained – which subjects do you find interesting as you are doing them, the time goes quickly, you feel that you have achieved something at the end of the lesson. This group of pupils favoured the definition where *“relevant” is connected to the present; it is situational*. The responses to this task follow that inclination. 20 out of the 30 pupils found the core subjects useful to them as they were studying them in class. In design and technology the figure was the highest with 27 pupils out of the 30 pupils indicating that they found the subject useful as they were studying it. This correlates with comments made in earlier interviews with the pupils – “it’s like having a proper job – using tools and machines and stuff. In some subjects like history all you do is talk and write.”

Atkinson, (1993:19 –20) found that 73% of pupils who chose Design and Realisation in KS 4 opted for the subject because of the positive experience they had gained in key stage 3. The majority of these pupils mentioned that they enjoyed making things, working with tools and materials. This suggests that they found the subject relevant in terms of the first definition, as they were doing the subject, and yet not relevant for future use. Wallace and Crawford, (1994:94) found that pupils with Attention Deficit and Hyperactivity Disorder, (ADHD) favoured concrete experience and active learning. Three pupils of the sample of 30 have a statement that identifies them as having ADHD.

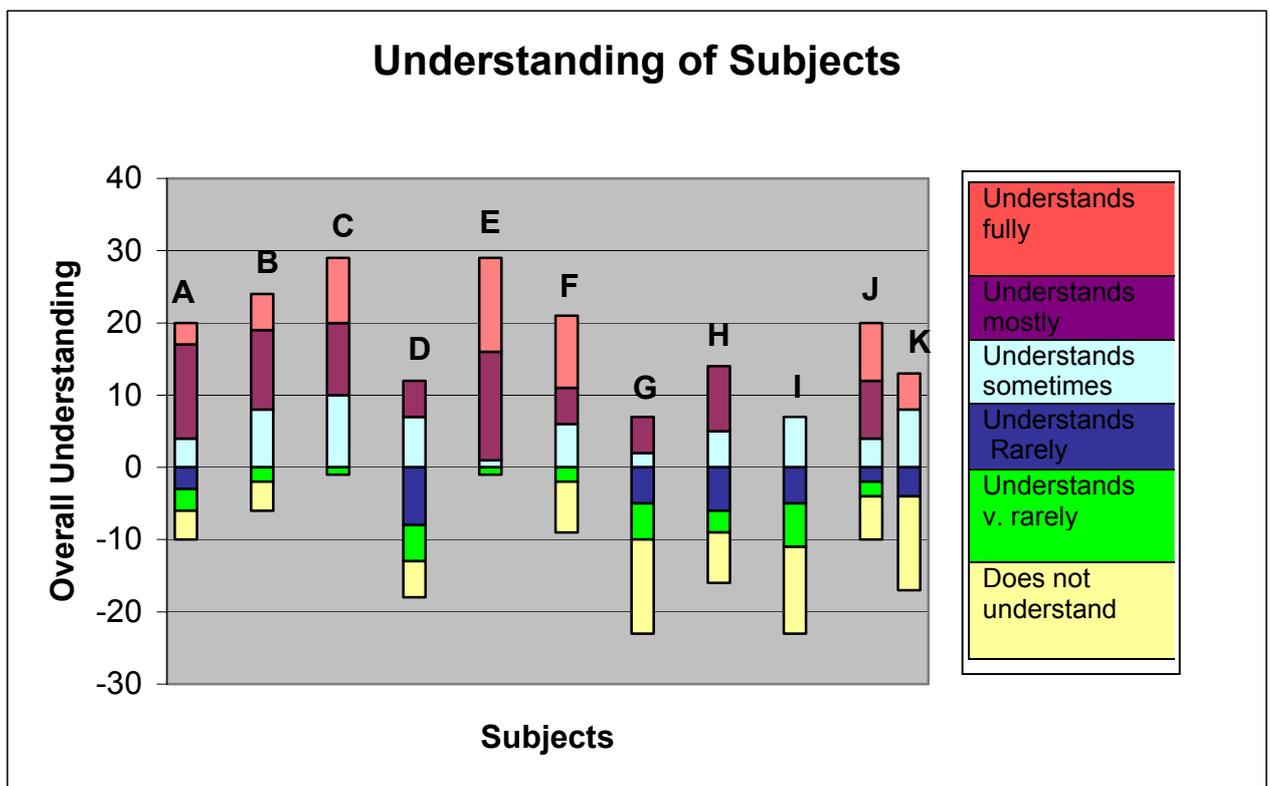
Table 5k offers a record of responses that address the question: *In which school subjects do you understand / see what you are doing?* Figure 5L presents the information in graphical form.

**Table 5k - In which school subjects do you understand / see what you are doing?**

	<b>Task 5</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>A</b>	English	3	13	4	-3	-3	-4
<b>B</b>	Maths	5	11	8		-2	-4
<b>C</b>	Science	9	10	10		-1	
<b>D</b>	RE		5	7	-8	-5	-5
<b>E</b>	Design and technology	13	15	1		-1	
<b>F</b>	PE	10	5	6		-2	-7
<b>G</b>	Welsh		5	2	-5	-5	-13
<b>H</b>	ICT		9	5	-6	-3	-7
<b>I</b>	History			7	-5	-6	-12
<b>J</b>	Engineering	8	8	4	-2	-2	-6
<b>K</b>	Music	5		8	-4		-13

Understands fully      does not understand at all

**Figure 5L - In which school subjects do you understand / see what you are doing?**



Task 5 explored pupil's perception of subjects where they understood or could see what they were doing. The task was presented to them as "*which subjects do you understand what you are doing in – if a teacher says you need to do this you understand why, or, if a teacher says you need to do this you can see why it needs to be done?*". Design and technology recorded the most positive response with 29 pupils out of 30 indicating that they could understand or see what they were doing. Science scored a similar response but the intensity of the design and technology response was greater, 28, as opposed to 19 recording category 6 or 5 responses. This response correlates with comments made in earlier interviews – "you can see what you are doing". The tangible nature of the subject appears to be a key factor.

Table 5m offers a record of responses that address the question: *Which school subjects do you enjoy?* Figure 5n presents the information in graphical form.

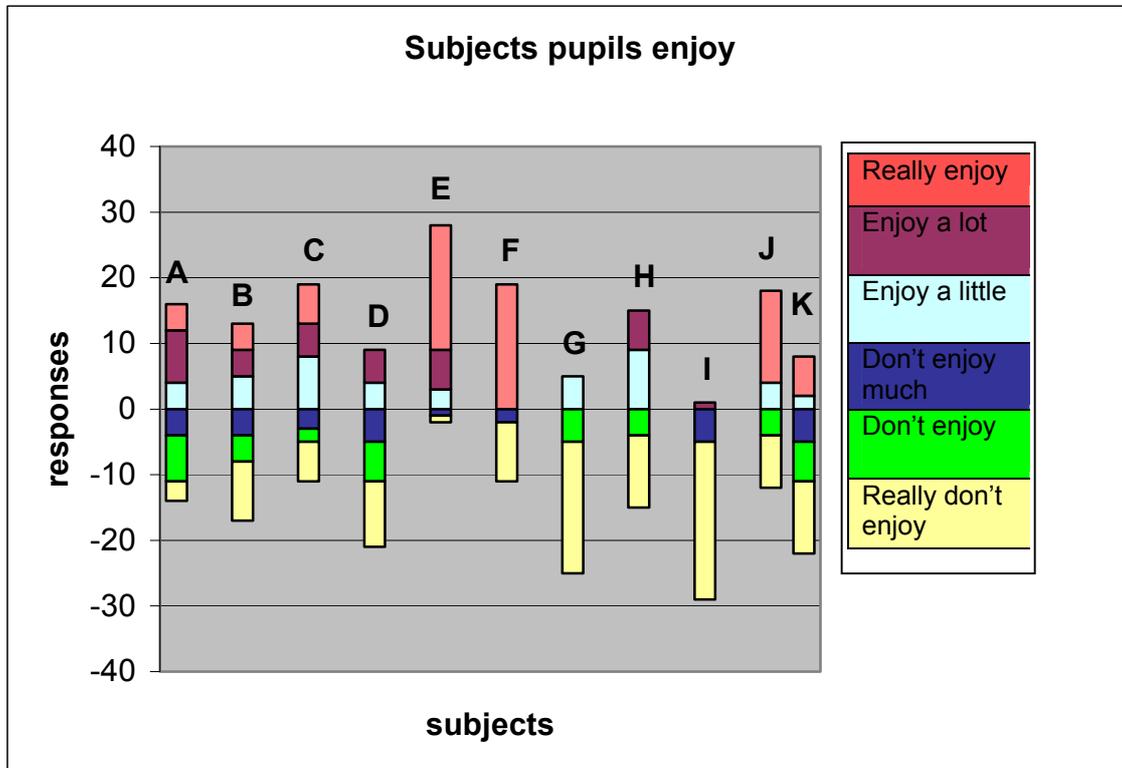
**Table 5m - Which school subjects do you enjoy?**

Enjoy very, very much      do not enjoy at all



	<b>Task 6</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>A</b>	English	4	8	4	4	7	3
<b>B</b>	Maths	4	4	5	4	4	9
<b>C</b>	Science	6	5	8	3	2	6
<b>D</b>	RE		5	4	5	6	10
<b>E</b>	Design and technology aft	19	6	3	1		1
<b>F</b>	PE	19			2		9
<b>G</b>	Welsh			5		5	20
<b>H</b>	ICT		6	9		4	11
<b>I</b>	History		1		5		24
<b>J</b>	Engineering	14		4		4	8
<b>K</b>	Music	6		2	5	6	11

**Figure 5n - Which school subjects do you enjoy?**



Task 6 asked, “*Which school subjects do you enjoy?*”. Design and technology scored the highest –28 pupils out of 30 recording a positive result. This can be compared to the Core subjects. These scored positive results as follows, English, 16, mathematics, 13, science, 19. Physical education recorded 19 positive responses in the highest category but had 11 negative responses. The strength of positive response may be related to both subjects being practical in nature. Atkinson, (1993:19 –20) found that pupils specifically mentioned that they enjoyed working with their hands. Brochocka *et al*, (2001:26) reported that design and technology was enjoyed by more pupils than any other subject. This result echoes some of the sentiments expressed in earlier interviews, “ *In D&T the teachers are interested in us and talk to us about things outside school, You get treated like an adult.*”

## **5.5 Conclusions**

Pupil understanding of the term relevant / relevance has been explored. The pupils subscribe to both definitions; “*relevant*” *connected to the present, situational*; “*relevant*” *preparation for a particular purpose*. Pupils favoured the first definition but most agreed with both definitions. The fact that there was greater agreement with the situational definition resonates with Goleman, (1996:83) and Mischel (1989). The sample would be low in emotional intelligence or emotional self-regulation and the ability to deny impulse in the pursuit of a particular goal. A sample with higher ability may favour definition (B). They might perceive relevance more in terms of preparation for a future purpose.

It should be acknowledged that pupils could perceive the term “relevance” in different ways. How do Ofsted and other educational commentators use the term? Pupils in the case study school have a positive perception of the relevance of design and technology, irrespective of definition. The interview provides data that reflects a positive perception of the subject’s relevance and indicates the intensity of feeling.

The next phase of the research must now focus on how a positive perception of relevance in design and technology is promoted at this school. This will be achieved through a series of case studies. The case studies will set out to address the following questions:

How is relevance promoted in design and technology documentation at this school?

How is relevance promoted in classroom practice?

What aspects of teaching and learning in design and technology do the pupils perceive as promoting relevance?

What aspects of teaching and learning in design and technology do the pupils perceive as eroding relevance?

What is the relationship of the subject content as laid down by the National Curriculum and examination boards and the aspects these pupils see as relevant?

The case studies will provide a list of positive and negative factors. These can then be manipulated (an action research phase) to improve practice at this school and could be tested in an alternative setting.

## **Chapter 6 - Case Study 3**

**What factors contribute towards low ability and disaffected pupils having a positive perception of the relevance of design and technology at this school?**

*This chapter describes a case study carried out to identify factors that contribute towards a group of low ability and disaffected pupils having a positive perception of the relevance of design and technology at the school. The findings from this suggest that there are a range of strategies employed to promote the relevance of the subject in classroom practice, departmental documentation; policies, development plans and schemes of work. The next phase of the research will explore if different teachers at different schools can use these strategies.*

### **6.1 Introduction**

Pupil understanding of the term relevant / relevance was explored in Case Study 2. The findings from this suggest that pupils at this school have a positive perception of the relevance of design and technology. This case study sets out to identify strategies employed to promote the relevance of the subject at this school. The implications of these strategies for educational practitioners and other stakeholders are discussed.

### **6.2 Background**

Case study 1 identified a range of factors that contributed to pupils being engaged in learning in design and technology: the quality of teacher pupil relationships, high expectations, and the practical nature of the subject. These factors were then reviewed in relationship with the relevant literature. Many of these factors resonated with findings in the literature, (*Rogers, 1998:196 –208, Brochocka et al, 2001:23-29, Tufnell et al, 1997:226 –227, Pollard and Triggs, 1997:245 and Geen, 2001:34*). However, there were indications from staff interaction with the group that they saw their design and technology work as

“relevant”. This appeared to conflict with research undertaken by Brochocka *et al*, (2001:23-29) Growney, (1996:75-79) and Atkinson, (1993:17 –25). These researchers found that pupils in their samples did not perceive design and technology as being relevant.

The literature (Cambridge Advanced Learner’s Dictionary 2003) defines ‘relevant’ in two ways: firstly, connected with what is happening or being discussed, secondly correct or suitable for a particular purpose. The first is connected to the present; it is situational, whilst the second connects more with preparation for a particular purpose. Case study 2 found that the pupils in the focus group subscribed to both interpretations but that they favoured the first definition - *connected with what is happening or being discussed*. This case study aims to identify factors that contribute towards pupils having a positive perception of the relevance of design and technology at this school. It is acknowledged that there will be many factors that contribute to this occurrence. However, to focus the case study two questions are posed:

1. What factors can be identified in design and technology classroom practice that contribute towards pupils having a positive perception of the relevance of design and technology at this school?
2. What factors can be identified in departmental documentation; policies, development plans and schemes of work that contribute towards pupils having a positive perception of the relevance of design and technology at this school?

### **6.3 Methodology**

The primary methods employed were: observation, interviews and the use of a form of Delphi group (Toffler-1970: 462). The form taken by the observation can range from highly structured to unstructured. Cohen *et al*, (2000:311–313) provide a comprehensive list of elements that need to be included. Cohen *et al*, (2000:306) suggest that numerical data can be generated from the

structured observation schedule. This allows for comparisons to be made between settings, situations and frequencies. Patterns and trends emerge and can be numerically calculated. A structured observation schedule needs to be carefully piloted. Checks need to be made to ensure that all relevant categories are covered and that the observer is physically capable of recording the information during the observation. Comments on the pilot observation are reported below, a report of a preliminary pilot observation is included in appendix 1.5.

Observations were carried out by the Delphi group. Developing a semi-structured observation schedule supported the Delphi group in carrying out observations – triangulation within methods. There was a basic guiding pro-forma developed for the pilot observation, (see appendix 1.4) reported below. An opportunity to record other observations that were deemed significant was also included. These could then be developed to new categories that could illuminate issues that were not considered or planned in the original research. Care was taken to ensure that colleagues were consistent and followed a common approach to entering the data.

The Delphi group members were interviewed separately and their responses recorded and checked before any joint analysis. As soon as the interview had finished the key points were fleshed out to form a transcription. The transcription was then given back to the interviewee to check for accuracy of meaning. This technique resonates with Kvale, (1996:183) proposition that: “Interviewee’s statements are not simply collected by the interviewer, they are in reality, co-authored”.

Analysis of departmental documentation was carried out by reading the documentation, discussing the documentation with members of the department and the Delphi group and then reflecting on our interpretations. Two members of the Delphi group used the observation pro forma, (1.4) as a framework. They were instructed to read through the documentation and note any reference to relevance. This would then be recorded briefly and clarified in a de-briefing interview.

## 6.4 Pilot study comments and observations

The observational pro forma included details on: Context – the physical setting, time of day, weather conditions, Timing – an indication of when, how far into the lesson, Persons – the people that are taking part, how many of them, their characteristics, Activities – the aims of the lesson, in terms of teaching and learning, Resources – what resources are deployed, Reactions – how the pupils are reacting to the activities identified above, Feelings – what people feel and how this is expressed, (see 1.7).

Also included were the two definitions: (A) “relevant” connected to the present, situational; what the teacher is teaching is being clearly linked to the task in hand; what the pupils are learning is clearly linked to the task in hand. Record number of incidents, lesson and comment, and, (B) “relevant” preparation for a particular purpose; what is being taught is made explicit in terms of its usefulness in later life; A skill for life; Preparation for a job. There was also a space to record the number of incidents and to make any other comments.

Identifying the references to relevance, (A) and (B) was quite simplistic. For example, the teacher said, “*you need to know about this now, this could be useful for you when you have a job*” However, the teacher had used his life experiences to add real world relevance to a conflict between 2 pupils. This issue was discussed with the Delphi group. They recognised the device and agreed that some teachers used it effectively. The discussion concluded with the group agreeing with the inclusion of an additional category in terms of relevance - (C) pastoral relevance - where a behavioural issue was resolved by relating it to a real world situation. The pro forma was effective as it enabled a quick record of references to relevance to be made. An example of a completed observation proforma is included in appendix 1.7. The record could then be amplified by adding a note at the end of the lesson. The data collected in the pro forma could be easily numerically referenced. The number of references to relevance in each lesson could be recorded. The context of

the reference to relevance and other qualitative data would require follow up interviews to clarify meanings before cross-referencing could take place. There appeared to be sufficient data to address the research questions. The task was focused and would not intrude greatly on time.

The Delphi group reflected on the pilot. The major issue to emerge from this reflection was sensitisation. My colleagues and I knew that the aim of the research was to gather data on the use of relevance. Could they have referred to relevance a disproportionate amount of time because we were aware of the aims of the exercise? To address this issue the observers were encouraged to reflect on their experience of the last 8 years and to record if their observations were felt to be a-typical as a result of the teacher over or under reacting to the situation.

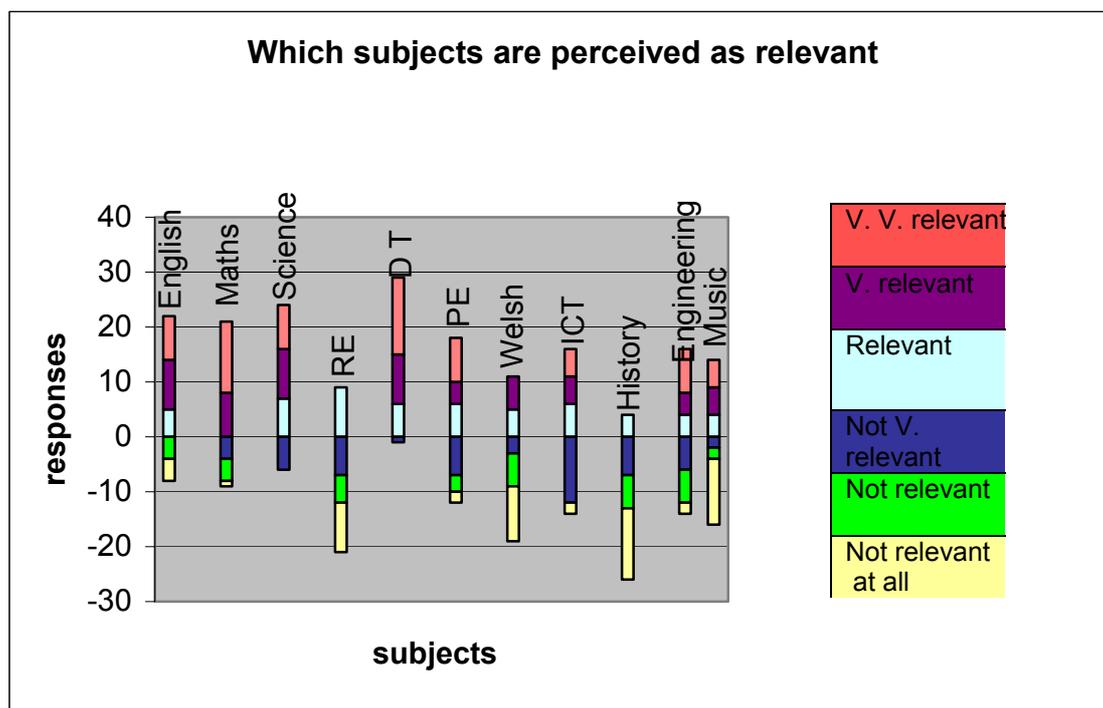
### **6.5 Findings and discussion - Lesson Observations - *how relevance is promoted in classroom practice***

The observations took place over a 2-week period. There are 25, 1 hour teaching periods in a school week. The 2 members of the Delphi group observed a total of 6 design and technology lessons. See example of completed observation pro-forma appendix 1.7. All the lessons included the members of the target group who were present on that day. The incidence of any reference to relevance is recorded in figure 6a:

<b>Figure 6a</b>		
	<b>SENCO</b>	<b>T Aid</b>
design and technology	21 in 3 lessons	16 in 3 lessons

Numerically these findings have some similarity to the findings of the previous case study (Thomas and Denton, 2006:45) that looked at how pupils perceive relevance, (see figure 6b). Design and technology was found to be the subject that pupils perceived to be most relevant.

**Figure 6b**



This case study is a very small snapshot and relies on the observations of 2 members of the Delphi group and six observed lessons. There is clearly an opportunity for error due to the size and time scale of the sample. There may be a case to run the observations again and over a much longer period of time. However, the observers were instructed to apply a longitudinal perspective and to note if the references to relevance were atypical. Both observers were interviewed to gain a more complete picture. The interviews are recorded in appendix 2.4.

### **Findings - Interview with SENCO and teachers' aid**

It was inevitable that comments were made on other subjects. Both the SENCO and the teachers aid supported the group of pupils in other lessons. All teaching staff were aware that research was taking place at the school but would not necessarily be as aware of the present theme of "relevance". The Delphi group was very aware of the relevance theme and noted a low reference to relevance in other lessons. Both observers commented that this was not atypical. In some lessons relevance was never alluded to. Although

this may not relate directly to the research question it does create a reference point against which frequency of use can be measured against.

Would the incidence of reference to “relevance” in other subjects have been higher if staff had been made *as* aware of the issue as the design and technology teachers? Here are two responses. Firstly, the SENCO and teachers’ aid were both briefed to use a longitudinal perspective and to note if the teacher’s use of “relevance” was atypical; they both reported that their observations were typical. The use of “relevance”, as they perceived it, was far greater in design and technology than other subjects. Secondly, Woods, (1996:83) describes researchers who adopt a qualitative approach as those who: “Seek lived experiences in real situations. They try not to disturb the scene and to be unobtrusive in their methods in an attempt to ensure that data and analysis closely reflect what is happening.” Informing participants of every development would disturb the scene and would make the research more difficult to manage. There would also be a greater risk of reactivity, (Lave and Kvale, 1995:226).

Both interviewees noted that the use of relevance was systematic in the pedagogy of design and technology lessons observed – “design and technology lessons in general seem **always to pick up on** the relevance theme”, (SENCO), “Design and technology lessons **always seem to be peppered** with references to relevance” (TA).

Both interviewees noted that the use of relevance was regulated to have effect at intervals throughout the lesson – “You tend to make announcements **at intervals** throughout the lesson”, (SENCO), “design and technology lessons seem to be **structured a bit at a time**, You all tell or show these pupils something **at regular intervals** throughout the lesson, ” (TA). In response to the follow up question what is an “interval”? The SENCO defined it as a critical period of time that was the duration of the classes’ engagement on a task. It depended on the class, the task and the teacher’s ability to sense when things were shifting away from engagement. The teachers’ aid gave a time of anything between 2 and 15 minutes. It depends on how things are going in the lesson.

Both interviewees noted that the use of relevance was explicit. The pupils were instructed that what was going to happen next or was taking place at that moment was relevant to them – “Make announcements at intervals throughout the lesson which **herald the relevant bits ....a tendency to punctuate** the lesson with “This is important.. You need to know how to do this” (SENCO), “**You all tell or show** these pupils something at regular intervals throughout the lesson.... The lesson continued with a **structured demonstration, step-by-step**, on how to produce a simple 2 D design drawing. “To get this on your screen you will need to do this, this and this”, (TA).

On the issue of being over sensitised both interviewees commented that their observations were representative of their experiences over much longer periods. “My formal recording of observations may be over a short period but **my experience of teaching and learning across the subjects in this school is over a period of 10 years**”, (SENCO). “I have worked at the school **for 8 years** and supported in lessons for that amount of time. I believe that my recorded observations over the week of lessons are **a fairly accurate picture of what happens, in general, in most lessons**. I am more aware of the use of relevance in design and technology because that’s where I notice it the most.”

There was little disparity in both sets of interview. Both interviewees were in agreement with the author’s interpretation of their observations. This could be for a range of reasons. After 2 years of being directly involved in action research and 15 years of informal observation it could be argued that the SENCO and teacher’s aide had sufficient skill to carry out meaningful observations, or, they had become so aware of the use of relevance in design and technology they were unable to identify it as readily in other subjects. The focus of this research was design and technology; it could be argued that the perceived low incidence of the use of relevance in other subjects would be a separate issue.

## **How is relevance promoted in design and technology documentation at this school?**

Analysis of the departmental documentation was selected as a starting point to establish if “relevance” was explicitly built into departmental policy, schemes of work and lesson plans. The departmental documentation, policies and development plans provided little direct reference to the systematic use of “relevance”. However, the schemes of work showed considerable reference to (A) *“relevant” connected to the present, situational; What the teacher is teaching is being clearly linked to the task in hand; What the pupils are learning is clearly linked to the task in hand.* For example, a lesson on finishes when a project had reached the finishing stage. The group then analysed schemes of work from four other subjects and found that these too used relevance in a similar way. An aim of a scheme of work is to link teaching and learning to the task or lesson that it refers to. The use of “relevant” as in (A) could be found in other subjects’ schemes of work.

The analysis of departmental documentation found that “relevance” was not explicitly built in. The Delphi group and departmental members, therefore, reflected on ways in which the department promoted relevance in its procedures. The department marketed itself positively by using strategies to engage with the community. Two examples are; the primary transition project, and the design and technology exhibition.

The primary transition project is aimed at Year 6 pupils in the feeder primary schools. The pupils are invited in to the department for a day to carry out a problem solving design and make task. For example, designing a pipeline to transport water from a dam to a city. This would entail justifying the “best” route, costing, designing and making models of their solutions using workshop equipment. Representatives from industry augment the teaching staff and add real world relevance with a video presentation of a similar scheme in real life. There is an element of fun and competition as the models reach completion and an oral evaluation is given by each of the groups.

The department had never formally evaluated the effectiveness of the day; the school had never formally evaluated the strategies used to support the primary transition process. A semi-structured interview schedule was developed based on the model used to investigate the issue of relevance in the previous case study. A mixed ability group of Year 7 pupils were interviewed to seek their opinions on the strategies used. The findings are recorded in figure 6c. All definitions were used to frame the concept of relevance.

		Very, very relevant			not relevant		
Figure 6c		6	5	4	3	2	1
<b>A</b>	Parents evenings in your primary school when teachers from this school spoke to you and your parents <i>Oct /Nov – Y6</i>				3	8	9
<b>B</b>	Parents evenings in this school when teachers from this school spoke to you and your parents <i>June Y6</i>			2	4	8	6
<b>C</b>	Music fun day <i>June Y6</i>	4	4	8	3		
<b>D</b>	Technology fun day <i>Nov Y6</i>	6	5	6	3		
<b>E</b>	Normal taster days – when you all came to the school and did different lessons <i>Feb Y6</i>	6	5	6	3		
<b>F</b>	When subject teachers from this school visited you at your primary <i>Oct /Nov Y6</i>	3	4	8	3	2	

The activity days were enjoyed by this sample of 20 pupils more than the parents' evenings. When asked about the technology day the pupils gave a range of positive responses:

*They enjoyed the practical bits...making things ...being in a workshop...doing project work about a real project...working in teams...having people who were not their teachers at the time to teach them...having people with real jobs to work with them on the project...thinking about being an engineer or a designer when they grow up*

From this snapshot the primary pupils had a positive experience of design and technology before they arrived at the secondary school. They had spent a day with the design and technology teachers in their own setting. These perceptions resonated with the findings of the previous case study, (case study 2) regarding the pupils' perception of the term "relevance", in particular with definition A - *relevant connected to the present, situational*. The results of that semi structured interviews suggested that pupils found a subject relevant when there was understanding of the aims and context of the lesson; because relationships were positive; experiences in the lesson were positive / enjoyable; you could see what you were achieving at that time and could, therefore, understand why you were being asked to do something. This strategy served to promote the subject's relevance before the pupils formally arrived at the school; a positive start that needed to be reinforced throughout the subsequent years.

The design and technology exhibition is an inclusive event that celebrates the success of pupils across the age and ability ranges. Work from the research group is often displayed if it meets the criteria of being a "best effort". The exhibition is open to the community and to parents. There have been occasions where it has been the only event that a parent has voluntarily attended. Contact with the school for these parents can be confrontational with the Educational Welfare Officer or disciplinary hearings. They tend not attend parents evenings. Gutteridge, (2005) found that parental non-attendance to parents evening was a typical symptom of the disaffected child.

The exhibition can act as a bridge and engage the parents of a disaffected child into a positive relationship with the school. Including work from this group of people may be for some the first tangible acclamation the school has given them since early primary school. Some pupils found that through having worked displayed and thus achieving acclamation the subject was relevant to them in terms of definition (A), it was *connected* to what they were doing and it was enjoyable at the time.

## 6.6 Conclusion

It should be acknowledged that other factors contribute to a pupil's perception of a subject. The school and its curriculum emit messages that can be interpreted differently by different people. The term "curriculum" is problematic and open to a range of interpretations. It can be interpreted broadly:

"Encompassing the experiences of everyone in the institution... Curriculum does not just refer to the written intentions of teachers, but to the sum of all the messages sent and received," (Potts & Armstrong, 1995:78). In this sense it is inevitable that other factors contribute: What impact does display of work have? The tone of voice the head teacher uses to speak about the subject? In what way does the community perceive the subject?

Brochocka *et al*, (2001:23-29) Growney, (1996:75-79), and Atkinson, (1993:17-25) all found that their samples did not perceive design and technology as relevant. This sample was focussed on low ability and disaffected pupils; their samples were not identified as being low ability and are more likely to be based on mainstream mixed ability classes. The career aspirations of both pupils and parents would also impact on their perception of the relevance of a subject. All were valid issues and were worthy of further research. However, this research was based on classroom practice at the author's school. These issues were outside the scope of his research.

In response to the research question "How is relevance promoted in design and technology classroom practice at this school?" The answer appeared to be that in the observed design and technology lessons the use of relevance was systematic, and explicit. The observers reported that the children are told in each lesson, throughout each lesson and clearly during each lesson that design and technology is relevant to them. This persistent reminding was reinforced by tangible, relevant activity within the lessons observed.

There are similarities with critical point inputs –a short, focussed teaching strategy that supports learning. Denton, (1994:61) comments that critical inputs can be effective in helping children recall and transfer previously learned

knowledge. He suggests that they are particularly effective in supporting project work in design and technology. Critical point inputs can help to focus lessons, share developments and learning from different on-going projects, and, if well managed could be a motivational tool. This strategy could be particularly useful with low ability groups. Academic engaged time, AET, is a term used to describe a pupil's application to a task and positively correlates with achievement, (Leech and Ingram, 1989). Denton, (1992) found that AET rises when children recognise the relevance of specific learning to their own future.

In response to the research question "How is relevance promoted in design and technology documentation?" The answer appeared to be that relevance was not explicitly written in. In the observed lessons the observers found that the teacher's use of relevance was "systematic and explicit", the documentation does not display a structure that reflected this pedagogy. Strategies such as the primary transition project, and the design and technology exhibition were only perceived as promoting relevance after reflecting on them. The primary aim of such strategies was to support transition and to exhibit pupil's work.

The results of the previous case study, (case study 2) shows that this group of pupils favoured the first definition - "*relevant*" is connected to the present it is *situational*. This previous case study found that these pupils had more difficulty in recognising the relevance of specific learning to their own future as opposed to recognising the relevance of specific learning to the situation that they were in. The classroom practice appeared to accommodate this learning trait by the systematic and explicit references made to relevance by the teacher. This teaching methodology was not directly supported by departmental documentation. The department promoted its relevance through its practices rather than its policies.

The Delphi group reflected on this case study and identified the following teaching strategies as contributing to the systematic and explicit references to relevance:

## Teaching strategies

**The 3 main categories:** Relevant for the future / for a career / for an examination?

Relevant for the present / need to complete a task / enjoyable / health and safety?

Relevant in a pastoral sense / relate to real world situations?

**Before the lesson starts** - is the subject matter relevant to the pupils? How much input have the pupil had in the selection of a relevant topic? Has any prior discussion been teacher led to direct towards certain topics, for pupils to gain ownership?

**At the start of the lesson** – explicit aims, short-term, check for understanding

**Activity** – timing gauged by pupil engagement to the task

**Re-focussing / critical inputs** –

Immediate relevance – *need to know to do this*

Real world – *in a factory they do this*

Future career – *if you are thinking of being a ???? you would need to do this*

Future life – *this will be useful for you when you have a house of your own*

Health and safety – *watch this or you may hurt yourself*

**Use of praise / exemplar material**

This is good work. This is what John has done

**Reduce fear of mistakes**

We all make mistakes, everybody learns from mistakes, you learn more when you don't get it right first time.

**Self assessment / group assessment**

What do the class think? What do you think?

## The next stage

The next phase of this research seeks to establish if strategies that promote the relevance of design and technology, identified in previous case studies at the researcher's school, can have an impact in different schools. Three schools agreed to take part in the research. The schools were selected because they were different forms of comprehensive schools to the researcher's school. The teachers who taught the identified class were prepared to support and cooperate with the researcher and taught the groups for the majority of their design and technology time. Each school operated a similar system of setting low ability and disaffected pupils into a distinct group.

### Objectives –

1. To assess pupil perception of “relevance” using the semi-structured interview designed for the previous case study (case study 2)
2. To assess pupil perception of the “relevance” of design and technology in these schools using the semi-structured interview designed for the previous case study (ibid)
3. To observe a series of lessons with 3 different design and technology teachers in 3 different schools to assess their use of “relevance” as a means of engaging pupils in learning
4. To then interview the teachers to discuss the use of “relevance” as a means of engaging pupils in learning – the use of the identified teaching strategies
5. To observe, after half a term, the teachers' use of the identified teaching strategies
6. To interview the teachers after half a term to assess the impact of using the identified teaching strategies

7. To observe a lesson in each school after a full term to compare pupil engagement in learning to the previous visit
8. To interview the class teachers after a full term to ascertain their perceptions of the effectiveness of the identified teaching strategies
9. To reassess the pupils' perception of the relevance of design and technology using the semi-structured interview.

## **Chapter 7 - Action research report – phase 1**

*This chapter seeks to establish if strategies that promote the relevance of design and technology, identified in previous case studies at the researcher's school, can have an impact in different schools. Three schools agreed to take part in the research. The researcher visited each school and interviewed the teacher involved to gain their perceptions of the pupils. The strategies that promoted relevance at the researcher's school were discussed and the teachers agreed to implement these with the pupils over a period of two terms. Teachers at the three schools were instructed on how to use the semi structured interview schedule developed in Case Study 2 to record the perceptions of the pupils. Findings at the three schools were then referenced against the findings at the researcher's school. Schools C and D had similar profiles to the researcher's school, (school A) in terms of the perceptions of the staff and the pupils. School B recorded findings that were less similar to the researcher's school.*

### **7.1 Introduction**

This particular case study seeks to: assess what are the perceptions of staff and pupils at three other schools regarding the relevance of design and technology; share with the three schools the strategies identified in the researcher's school that promoted the relevance of design and technology.

Three schools agreed to take part in the research. The schools were selected because they were different forms of comprehensive schools to the researcher's school. The teachers who taught the identified class were prepared to support and cooperate with the researcher and taught the groups for most of their design and technology time. Each school operated a similar system of setting low ability and disaffected pupils into a distinct group. The three schools selected were a boys' comprehensive, a mixed church school and a girls' comprehensive. The schools will be labelled respectively B, C and D in this report. The researcher's school will be identified as school A. Schools

A and D had teachers with over 15 years experience at that school; school C a teacher with 8 years service and school B a teacher in his second year of teaching. (See Table 7a)

<b>Table 7a</b>	Length of Service at school in years	Total length of service in years	% of total DT lessons with group
School			
A	18	20	75% - 6 out of 8 lessons
B	2	2	100%
C	8	11	75% - 6 out of 8 lessons
D	16	22	62% - 5 out of 8 lessons

## 7.2 Aims

To establish if strategies identified as promoting the relevance of design and technology in the researcher's school with a group of low ability and disaffected pupils can have an impact in a different school with a similar groups of pupils.

**Research questions – phase 1 – before implementing strategies intended to promote the relevance of Design and technology**

What perceptions of the term “relevance” did the pupils at the 3 schools have?

How did these perceptions compare with those of the pupils at the researcher's school?

How relevant was design and technology perceived by the sample pupils in these three schools before the strategies were implemented?

How did the staff at the three schools perceive their groups of low ability and disaffected pupils in terms of ability, attendance, motivation, ability to remain on task, behaviour and quality of teacher pupil relationships?

What were the perceptions of the staff at the three schools regarding the pupils' ability to engage in learning in design and technology?

What were the observations of the staff at the three schools regarding how relevant design and technology was perceived by: senior management, other staff, pupils, parents and the community?

What strategies did the staff at the three schools use to promote the relevance of the subject?

**Research questions – phase 2 – *after implementing strategies that promote the relevance of design and technology***

How relevant was design and technology perceived by the pupils in these three schools after the strategies were implemented?

Had staff attitudes toward the focus group changed?

Had there been any change in the perceptions of the staff at the three schools regarding the pupils' ability to engage in learning in design and technology?

Had the perceptions of the staff at the three schools regarding the relevance of design and technology changed?

Which strategies, if any, did the staff at the three schools feel were most effective in promoting the relevance of the subject?

### **7.3 Method – first phase**

The project was discussed informally with the respective design and technology teachers in each school during 2005. This informal discussion was vital to the progress of the action research project. The researcher was able to assess, face to face, whether or not the teacher would support and cooperate

with him over the following 18 months. Their head teachers were then formally contacted in the summer term of 2005. A covering letter was sent to explain the research and a consent form, signed by the head teacher, was returned to the researcher. Visits to each school were then planned for the early part of the autumn term 2005. The researcher estimated that the teacher interview discussion could be achieved in a 1-hour slot during a “free period”. A grant from the General Teaching Council of Wales covered supply-teaching costs. This allowed the researcher time to carry out the research. The format of each visit followed the same structure:

- A résumé of the research so far
- A discussion with the design and technology teacher to clarify terms, definitions and methodology – how to implement the semi structured interview
- An interview with the design and technology teacher to assess their perceptions of their identified group and the relevance of design and technology at their school
- A discussion of the teaching strategies and how they could be implemented

The framework can be found in appendix 3.1.

Each teacher was briefed using the above format. The semi structured interview to be administered by the teacher to their pupils, and the interview between the teachers and the researcher followed the methodology that had been established in earlier case studies. Qualitative data was collected in note form and a rating scale was also used to numerically compare responses from each school. The scale selected was a 6- point version of the Likert, (1932) rating scale ranging from 6 - very strongly agree - to 1 - very strongly disagree. The three teachers were instructed on how to use the semi structured interview with their pupils. Assurances were offered that the interviewing of pupils would not be overly obtrusive. The researcher had found in his own school that the Senco completed the interviews within 40 minutes. The teachers at the 3

schools were then asked to implement the semi-structured interview with their respective group of low ability / disaffected pupils and to return the result sheets to the researcher to analyse using the Radnor, (2002) method. This data was then referenced against the corresponding findings collected at the researcher's school. In each case the pupils worked in groups and the sample size was 15. Any similarities or differences could then generate further questioning and discussion.

This approach has its limitations. The sample is small,  $n = 15$  in each of the 3 schools; if a group of 5 pupils gave a response based on a misunderstood question it would constitute a 33% difference. Rating scales have other limitations. The recorded responses may not accurately reflect what the respondents' opinions might be. There may be other factors that contribute to the difference in response such as the career aspirations of the pupils and the sociological composition of the samples.

The three teachers were assured of anonymity and that the transcripts of their personal interviews with the researcher would be available for them to check for accuracy. The transcripts are found in appendix 3.2 whilst the discussion is included in the main body of the report. A discussion of the teaching strategies and how they could be implemented followed the interview. The aim of the discussion was to raise awareness of strategies that promote relevance in design and technology. After the discussion a semi-structured interview was carried out to assess the extent to which these strategies were used before the action research phase began. The data collected was then compared to the findings in the researcher's school.

The researcher, in collaboration with the Delphi group, followed the same format as set out in appendix 3.1 and recorded their collective opinions of where on the rating scale the researcher's school's responses would be located. This information could then be used as a reference point to identify features in the other schools that were similar or different. Further questions could then be generated. What would be the significance of features being similar or different?

It was acknowledged that the findings would generate a considerable amount of data. Previous case studies had used graphs to present the data. However, the use of graphs in this case study could be problematic due to the amount of data to be presented. Trochim, (20/10/06<http://www.socialresearchmethods.net/kb/>) suggests that a final score for the respondent can be calculated as a "summed" scale. An illustration of calculating the final summed score for 2 exemplar schools, x and y, is given in Table 7b below. This is calculated by multiplying the incidence of each response by the appropriate rating scale number. For example: (6 is high / 1 is low)

Calculation School 1:  $(6 \times 5) + (5 \times 3) + (4 \times 2) + (2 \times 2) + (1 \times 3) = 60$

Calculation School 2:  $(6 \times 3) + (5 \times 3) + (4 \times 3) + (3 \times 2) + (2 \times 2) + (1 \times 2) = 60$

#### 7.4 Findings and discussion – the semi structured interviews for pupils

<b>Table 7b</b>		6	5	4	3	2	1	Total
	School x	5	3	2	0	2	3	60
	School y	3	3	3	2	2	2	57

An example of data for one question category can be found in appendix 3.3. Focussed data is presented in the main body of the report.

### **Question 1: Finding out what relevant means to you**

**What understanding of the term “relevance” did the pupils at the three schools have? – See figure 7c**

The sample pupils at the three schools subscribed to both understandings of the term “relevant” - *connected to the present; it is situational* and, *preparation for a particular purpose*. The majority of pupils recorded agreement with both definitions in all the categories. The greatest differences came from school B in categories E and I – “*you like the subject*” and “*you like the teacher*”. This school recorded considerable disagreement; liking a subject or a teacher was not perceived as contributing to a subject’s relevance. School B was also unanimous in the “strongly agree category” that a subject was relevant if it could get a person a job.

**How did their understanding compare with those of the pupils at the researcher’s school?**

With the exception of categories E and I the graphs show a similarity to the results at the researcher’s school. The researcher’s group favoured the first definition: “*relevant*” is *connected to the present; it is situational*. The strongest agreement with the researcher’s group came in categories B and D. The categories that were connected to the second definition, *preparation for a particular purpose*, did not record a similar consensus. However, these categories scored highly with the other 3 schools with little disagreement, especially in categories A, F, H and J – useful to know about now, to get a job, you learn a lot and to be of some use in the future.

**Figure 7c - A school subject is relevant when**

6 very strongly agree, 1 very strongly disagree

Question	Task 1	School	6 very strongly agree, 1 very strongly disagree					Total	
			6	5	4	3	2		1
QA	The subject is useful to know about now	A		3	3	-6		63	
		B	3	5	6	-1		70	
		C	2	5	5	-2	-1	65	
		D	1	5	6	-3		64	
QB	The subject is interesting	A	7	3	5			77	
		B	5	4	4	-2		72	
		C	6	6	1	-2		76	
		D	6	5	4			77	
QC	You can see what you are doing	A	2	5	4	-2	-2	63	
		B	4	6	3		-2	70	
		C	5	6	2	-2		74	
		D	5	4	3	-3		71	
QD	You understand what you are doing	A	7	4	4			78	
		B	6	6	3			78	
		C	3	6	6			72	
		D	4	5	5	-1		72	
QE	You like the subject	A	8	4	3			80	
		B	4		1	-4		-6	46
		C	3	7	5				73
		D	7	4	4				78
QF	The subject is useful to help me in a job	A	4	4	3	-3	-1	67	
		B	11	4					86
		C	8	8		-3			97
		D	6	4	4		-1		74
QG	The time goes quickly	A	6	3	4	-2		73	
		B		5	7	-2		-1	60
		C	4	4	5			-2	66
		D		9	6				69
QH	You learn a lot	A	1	4	5	-2	-2	-1	57
		B	6	5	3			-1	74
		C	3	6	4		-2		68
		D	5	4	3	-2		-1	69
QI	You like the teacher	A	4	4	7				72
		B	4			-6	-2	-3	49
		C	6	5	4				77
		D	5	5	5				75
QJ	The subject could be useful in the future	A	5	4	2	-2	-2		68
		B	10	5					85
		C	6	4	5				76
		D	6	4	2	-2	-1		72

**Question 2 - Which subjects are relevant to you? – in each case 6 is high, 1 is low**

The sample pupils at the 3 schools perceived design and technology as being a relevant subject but their responses were not as positive as the researcher’s school. A higher number of pupils in school B, C and D perceived design and technology as not being relevant. School B recorded the greatest difference, with 6 of the sample, (n=15) indicating that they did not perceive design and technology as being relevant, (See figure 7d).

Figure 7d	School	6	5	4	3	2	1	Total
	A	7	4	3	-1	0	0	75
<b>D&amp;T</b>	B	6	0	3	-6	0	0	66
	C	6	3	3	-3	0	0	72
	D	6	4	3	0	0	-2	70

**Question 3 - Which subjects do you think will be of use to you in the future?**

The third question provided responses that were more consistent with the responses at the researcher’s school. The responses record that the majority of the pupils perceived that design and technology would be of use to them in the future (See Figure 7e). Three pupils at school B indicated in the mid low category that they did not perceive Design and technology as being particularly relevant to them.

Figure 7e	School	6	5	4	3	2	1	Total
	A	4	4	4	-2	-1	0	68
<b>D&amp;T</b>	B	3	3	6	0	-3	0	63
	C	6	6	0	-3	0	0	75
	D	6	3	6	0	0	0	75

Differences emerged, however, with the fourth and fifth question – *What subjects do you find useful as you do them? In which subjects do you understand / see what you are doing?*

The responses from the other 3 schools were around 40% less positive about design and technology than the researcher's school, (see figures 7f and 7g).

***What subjects do you find useful as you do them?***

Figure 7f	School	6	5	4	3	2	1	Total
	A	6	2	5	-1	0	-1	70
<b>D&amp;T</b>	B	3	0	6	-3	0	-3	54
	C	3	3	6	0	-3	0	63
	D	3	3	3	-6	0	0	63

***Which subjects do you understand / see what you are doing?***

Figure 7g	School	6	5	4	3	2	1	Total
	A	7	6	1	0	-1	0	75
<b>D&amp;T</b>	B	4	3	3	-3	-2	0	64
	C	3	6	3	-3	0	0	69
	D	6	3	3	0	-3	0	69

Both these questions focussed on an interpretation of relevance that is *connected to the present; it is situational*.

The final question – *What subjects do you enjoy?* – produced similar responses from the 3 schools to that of the researcher's school, (see figure 7h).

### ***What subjects do you enjoy?***

<b>Figure 7h</b>	School	6	5	4	3	2	1	Total
	A	9	3	1	-1	0	-1	77
<b>D&amp;T</b>	B	0	3	9	0	0	-3	54
	C	3	3	3	-3	-3	0	60
	D	9	0	3	0	0	-3	69

The majority of pupils enjoyed design and technology; the only difference was perhaps the intensity of enjoyment as reflected in their scaling of that response. At the researcher's school the majority of the pupils recorded their responses in the highest category. This should be considered in the context of the small size of the sample, N = 15 at each school, and the effects that teacher / pupil / personality interaction can have on a small sample.

#### **Semi –structured interviews with staff**

Full transcripts of the interviews with the staff can be found in appendix 3.2. In the table below, figure 7i, the letter given to identify the school indicates the response in the relevant column.

**What were the perceptions of the staff at the three schools regarding the pupils' ability to engage in learning? - See figure 7i**

<b>Fig 7i</b>	Rating scale to compare responses – 6 is high	<b>6</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>1</b>	Total length of service – 6 =15 years +, 4 = 8 years+ 2 = 2 years – see figure 1 for details	A D		C		B	
<b>2</b>	Ability of pupils in this particular group – <i>this assessment is based on the teachers' professional judgement using school assessment criteria – predicted GCSE grades</i>					A D	B C
<b>3</b>	Target grades – 6 = 50% to gain a C or above; 5 = 25% to gain C or above; 4 = 12%; 3 = 6%		A D		C		B
<b>4</b>	Attendance in D T lessons – 6 = 100%; 5 = above 95%; 4 above 90%; 3 above 80%			A D C	B		
<b>5</b>	Motivation – 6 all class always motivated; 5 most of class motivated in most lessons; 4 most of class motivated in some lessons; 3 some of class in some lessons; 2 a few of the class in occasional lessons; 1 none		A D	C		B	
<b>6</b>	Ability to remain on task - 6 all class always remain on task; 5 most of class in most lessons; 4 most of class in some lessons; 3 some of class in some lessons; 2 a few of the class in occasional lessons; 1 none		A D	C	B		
<b>7</b>	Behavioural / health and safety concerns –1 very frequent referrals, 2 frequent, 3 occasional, 4 rarely, 5 very rarely, 6 never		A D C				B
<b>8</b>	Quality of relationship – 6 excellent; 5 very good; 4 good; 3 occasionally good	A D	C	B			
<b>9</b>	Typical lesson – 6 Always problem free; 5 usually problem free; 4 generally problem free		A D	C B			

School D's profile appeared closest to the researcher's school in terms of the above sets of questions, whilst school B appeared to be the furthest from the researcher's school profile.

**What were the observations of the staff at the three schools regarding how relevant design and technology was perceived by senior management, other staff, pupils, parents and the community? - See figure 7j**

<b>Fig 7j</b>	Rating scale to compare responses – 6 is high How design and technology is perceived	<b>6</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>A</b>	Senior management	A		D C	B		
<b>B</b>	Staff		A	DC	B		
<b>C</b>	Pupils	A D	C	B			
<b>D</b>	Parents	A	D C	B			
<b>E</b>	Community	A		D C		B	

The researcher believed that at his school all interest groups perceive design and technology positively. The perception of the staff at the other schools was not as positive. School B again produced the profile furthest away from that of the researcher's school.

**What strategies did the staff at the three schools use to promote the relevance of the subject? See figure 7k**

Fig 7k	Rating scale to compare responses – 6 is high	6	5	4	3	2	1
A	Have you ever reflected on your own teaching methodology?	A D		C B			
B	Have you ever reflected on the issue of relevance?	A		D	C B		
C	Have you ever consciously attempted to make a lesson more relevant?	A	D	C	B		
D	Have you ever considered the relevance of the subject matter?	A D		B C			
E	Are lesson aims made explicit at the start?	AD BC					
F	How aware are you of timing in a lesson?	AD	C	B			
G	How frequently in a lesson do you use the following:						
	Immediate relevance	A D	B C				
	Real world	A D	C	B			
	Future career	A	D C		B		
	Future life	A	D C		B		
	Health and safety	AD BC					
	Use of praise	A D	C	B			
	Exemplar material	A D	C		B		
	Reduce fear of mistakes	A C	D		B		
	Self assessment / group assessment	A C		D	B		

This set of questions was based on the researcher's own teaching methodology and a common understanding of the terms employed. Inevitably the highest and most positive incidents of use were at the researcher's school. School D had a very similar profile. School B appeared to be the most infrequent user of similar teaching methodology.

## **7.6 Conclusions**

### ***The pupils' perceptions***

Preliminary analysis of the findings showed that the similarity in responses far outweighed any dissimilarity. School D appeared to match most closely the responses made by the researcher's school. School B appeared to display the greatest contrast whilst school C responses lay closer to school D than school B. This preliminary analysis generated further questions: What factors contribute towards the similarity of school D's responses? What factors contribute towards school B's responses being the most dissimilar? Answers to these questions could depend on a considerable range of factors, for example school ethos, pupils' career aspirations, parental background, the experience of the teacher and pupil teacher relationships. All of these factors were significant, but the research must be focussed on classroom practice and what is researchable by a practitioner researcher.

### ***The perceptions of staff***

There appeared that there were strong similarities in profile between school D and the researcher's school. It may be that the similarities in how the teacher perceived this group of pupils and the teaching methodology employed contributed to the pupils having a more positive perception of design and technology. Conversely school B emerged as having a profile that was farthest away from the researcher's school. The pupils at school B appeared to favour the deferred definition of relevance – *for a particular purpose, to get a job*. This

difference could be due to a range of factors: school ethos, aspirations of the pupils and their parents and the size of sample.

Many of the teaching strategies recommended in the discussion with the teacher appeared to be well used at school D, with the exception of self-assessment. Further research at this school could have supported the findings at the researcher's school. School C could also support some of these earlier findings. If the teacher at school C were to increase the frequency or intensity of certain strategies would their impact be measurable? Would the impact make a difference to the pupils' perception of the subject? School B's teaching methodology appeared the least similar to the researcher's school. Many of the teaching strategies that promote relevance identified in the previous case study were not used, or possibly not recognised, by the teacher at that school. School B had the least experienced teacher who had taught for the least amount of time at the school. He had less time to develop a relationship with the pupils. These may be factors that contributed to the differences that were identified. School C occupies the middle ground but its profile was closer to the researcher's school than school B.

The next phase of this action research project revisited school B, C and D. The aim was to establish what impact, if any, the teaching strategies, identified in the researcher's school as promoting the relevance of design and technology with a group of low ability and disaffected pupils, had in a different school with a similar group of pupils.

## **Chapter 8 - Action research report – phase 2**

*This chapter seeks to establish if the strategies that promoted relevance at the researcher's school had any impact at the other three schools. The teachers were re-interviewed and their use of the strategies discussed. The pupils were also re-interviewed using the semi-structured interview schedule. The findings were then referenced against the findings in Phase 1. Schools A, C and D were fairly consistent with Phase 1 findings. However, school B showed a significant positive movement in terms of the perceptions of both the teacher and the pupils. The teacher at school B was the least experienced. The strategies implemented by him at this school promoted the relevance of design and technology.*

### **8.1 Introduction**

The first phase of this action research project took place in the autumn term of 2005. The findings from these interviews were then recorded and referenced against the findings generated at the researcher's school. Phase 2 was the follow up and took place in the summer term of 2006. This allowed staff 2 terms to utilise the strategies.

### **8.2 Aim**

To establish what impact, if any, the teaching strategies, identified in the researcher's school as promoting the relevance of design and technology with a group of low ability and disaffected pupils, had in a different school with a similar group of pupils.

**Research questions – phase 2 – *after implementing strategies that promote the relevance of design and technology***

1. How relevant was design and technology perceived by the pupils in these three schools after the strategies were implemented?
2. Had staff attitudes toward the focus group changed?
3. Had there been any change in the perceptions of the staff at the three schools regarding the pupils' ability to engage in learning?
4. Had the observations of the staff at the three schools changed regarding how relevant design and technology was perceived by senior management, other staff, pupils, parents and the community?
5. Which strategies, if any, did the staff at the three schools feel most effective in promoting the relevance of the subject?

**8.3 Method –phase 2**

The format of each visit followed the same structure and can be found in full in appendix 3.1:

- A résumé of the research so far
- A discussion with the design and technology teacher to give feedback on the autumn term's findings from that school
- A discussion with the design and technology teacher regarding the re-implementation of the semi-structured interview.
- A semi-structured interview with the design and technology teacher to assess if their perceptions of the identified group and the relevance of design and technology at their school had changed. The teachers were not shown their previous responses, asked to record the most appropriate response and then invited to comment if there had been any change.

The transcripts of the teacher interviews are found in appendix 3.2 whilst the discussion is included in the main body of the report. A discussion of the teaching strategies and how they were implemented followed the interview. After the discussion a semi-structured interview was carried out to assess the extent to which these strategies were used now compared to before the action research phase began. Two terms had elapsed since the implementation of the Phase 1 semi-structured interviews with the teachers. They were not reminded of their earlier responses. This would help alleviate the possibility of the teachers merely repeating responses.

The teachers at the 3 schools were asked to re-implement the semi-structured interview with their respective group of low ability / disaffected pupils and to return the result sheets to me for analysis. This data could then be referenced against the findings collected during the autumn term. Any differences could then contribute towards supporting or refuting the effectiveness of the teaching strategies.

#### **8.4 Findings and discussion**

**Research question 1** - *How relevant was design and technology perceived by the pupils in these three schools after the strategies were implemented?*

An example of a completed data table, A1 indicates the initial response A2 the follow up response can be found in appendix 3.3. Focussed data is presented in the main body of the report.

##### **Question 1 - *Finding out what relevant means to you***

What understanding of the term “relevance” did the pupils at the 4 schools have after the strategies had been implemented?

The pupils’ perception of relevance appears to be similar in both phase 1 and 2. The 3 categories of agreement or disagreement with the statements show some changes in intensity but there is little movement in terms of changing the response from agreement to disagreement. See appendix 3.3 for a sample view of the complete data for one question.

**Question 2 - Which subjects are relevant to you? – See figure 8a**

*In each figure A1 indicates school A's initial response, A2 the follow up response 2 terms later.*

	School	6	5	4	3	2	1	Total
<b>Figure 8a</b>	A1	7	4	3	-1	0	0	77
	A2	8	4	2	0	0	-1	77
	<b>B1</b>	<b>0</b>	<b>6</b>	<b>3</b>	<b>-6</b>	0	0	<b>60</b>
<b>D&amp;T</b>	<b>B2</b>	<b>7</b>	<b>6</b>	<b>2</b>	<b>0</b>	0	0	<b>80</b>
	C1	6	3	3	-3	0	0	72
	C2	5	5	3	-2	0	0	73
	D1	6	4	3	0	0	-2	70
	D2	6	3	3	-3	0	0	72

In phase 1, school C and D appeared to match most closely the responses made by the researcher's school. There is a consistency of response; respondents categorise their perceptions as they did in phase 1. In phase 1 the pupils recorded very positive responses regarding their perception of the relevance of design and technology. The follow up semi-structured interviews with the pupils show little difference from the responses made in phase 1.

In phase 1 school B recorded 6 in category 3 - not very relevant - and failed to register a score in category 6 - very, very relevant. However, in phase 2 school B did not record any negative responses and 7 pupils moved into category 6 - very, very relevant. Schools C and D also showed a more positive response in Phase 2, but the shift in response was less pronounced. School A saw a deterioration in the pupils' perception. One response moved from category 3 to category 1.

**Question 3 - Which subjects do you think will be of use to you in the future? - See figure 8b**

	School	6	5	4	3	2	1	Total
<b>Figure 8b</b>	A1	4	4	4	-2	-1	0	68
	A2	4	4	4	0	0	-3	63
	<b>B1</b>	<b>3</b>	<b>3</b>	<b>6</b>	<b>0</b>	<b>-3</b>	<b>0</b>	<b>63</b>
<b>D&amp;T</b>	<b>B2</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>77</b>
	C1	6	6	0	-3	0	0	75
	C2	6	4	3	-2	0	0	74
	D1	6	3	6	0	0	0	75
	D2	6	3	6	0	0	0	75

School C and D display similar responses in both Phase 1 and 2. The main movement comes from school B whose, -3 in category 2 disappears in phase 2. School A again sees deterioration in the perception of the use of design and technology in the future. The pupils' negative perceptions are becoming polarised.

**Question 4 - Which subjects do you find useful as you are doing them? - See figure 8c**

	School	6	5	4	3	2	1	Total
<b>Figure 8c</b>	A1	6	2	5	-1	0	-1	70
	A2	6	3	4	0	0	-2	69
	<b>B1</b>	<b>3</b>	<b>0</b>	<b>6</b>	<b>-3</b>	<b>0</b>	<b>-3</b>	<b>54</b>
<b>D&amp;T</b>	<b>B2</b>	<b>2</b>	<b>5</b>	<b>5</b>	<b>-3</b>	<b>0</b>	<b>0</b>	<b>66</b>
	C1	3	3	6	0	-3	0	63
	C2	3	3	6	-3	0	0	66
	D1	3	3	3	-6	0	0	63
	D2	4	4	4	-3	0	0	69

Schools B, C and D all saw a positive increase. School A recorded a negative change in pupil perception. One pupil moved from category 3 to category 1.

**Question 5 - Which subjects do you understand as you are doing them? -**

See figure 8d

	School	6	5	4	3	2	1	Total
<b>Figure 8d</b>	A1	7	6	1	0	-1	0	78
	A2	7	7	0	0	-1	0	79
	<b>B1</b>	<b>6</b>	<b>3</b>	<b>3</b>	<b>-3</b>	<b>0</b>	<b>0</b>	<b>72</b>
<b>D&amp;T</b>	<b>B2</b>	<b>9</b>	<b>3</b>	<b>2</b>	<b>0</b>	<b>-1</b>	<b>0</b>	<b>79</b>
	C1	3	6	3	-3	0	0	70
	C2	4	5	4	0	0	-2	67
	D1	6	3	3	0	-3	0	69
	D2	5	3	4	-1	0	-2	66

School A and D display a fairly consistent response. School B and C both display a shift towards a more positive perception. School B displays the greatest movement, with 2 pupils moving from category 3 to a more positive perception and 3 pupils moving into category 6, the most positive response.

**Question 6 - Which subjects do you enjoy? - See figure 8e**

	School	6	5	4	3	2	1	Total
<b>Figure 8e</b>	A1	9	3	1	-1	0	-1	77
	A2	9	4	1	0	0	-1	79
	<b>B1</b>	<b>0</b>	<b>3</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>-3</b>	<b>54</b>
<b>D&amp;T</b>	<b>B2</b>	<b>6</b>	<b>6</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>78</b>
	C1	3	3	3	-3	-3	0	60
	C2	4	3	2	-2	-2	-2	59
	D1	9	0	3	0	0	-3	69
	D2	7	3	2	0	-3	0	71

School B shows a move from 3 pupils at category 1 – not enjoy at all – to all pupils having a positive enjoyable experience. This shift is further emphasised by 6 pupils recording a category 6 response – enjoy very, very much - whereas in phase 1 no pupil had registered in this category. The other schools all recorded similar responses in both phases in terms of a positive or negative perception.

**Research question 2 and 3 - *Had staff attitudes toward the focus group changed?***

*Had there been any change in the perceptions of the staff at the three schools regarding the pupils' ability to engage in learning?*

The data is presented below in figure 8f. Questions 1 and 2 have the same responses. The other questions are divided into 2; the top half records the phase 1 response and the bottom half the phase 2 response. When there is a change in response the response is recorded in bold and discussed in the text overleaf.

Table 8f	Rating scale to compare responses – 6 is high	6	5	4	3	2	1
<b>1</b>	Length of service – <i>based on the number of years the teacher has been at that school – 6 =15 years +, 4 = 8 years+ 2 = 2 years+</i>	A D		C		B	
<b>2</b>	Ability of pupils in this particular group – <i>this assessment is based on the teachers professional judgement using school assessment criteria – predicted GCSE grades</i>					A D	B C
<b>3</b>	Target grades – <i>6 = 50% to gain a C or above, 5 = 25% to gain C or above, 4 = 12%, 3 = 6%</i>		AD		C		B
				<b>B</b>			
<b>4</b>	Attendance – <i>6 100%, 5 above 95%, 4 above 90, 3 above 80</i>			A D C	B		
<b>5</b>	Motivation – <i>6 all class always motivated, 5 most of class motivated in most lessons, 4 most of class motivated in some lessons, 3 some of class in some lessons, 2 a few of the class in occasional lessons, 1 none</i>		A D	C		B	
				<b>B</b>			
<b>6</b>	Ability to remain on task - <i>6 all class always remain on task, 5 most of class in most lessons, 4 most of class in some lessons, 3 some of class in some lessons, 2 a few of the class in occasional lessons, 1 none</i>		A D	C	B		
			<b>C</b>	<b>B</b>			
<b>7</b>	Behavioural / health and safety concerns – <i>6 very frequent referrals, 5 frequent, 4 occasional, 3 rarely, 2 very rarely, 1 never</i>	B				A D C	
				<b>B</b>			
<b>8</b>	Quality of relationship – <i>6 excellent, 5 very good, 4 good, 3 occasionally good</i>	A D	C	B			
			<b>B</b>				
<b>9</b>	Typical lesson – <i>6 Always problem free, 5 usually problem free, 4 generally problem free</i>		A D	C B			
			<b>C</b> <b>B</b>				

### **Research question 2 and 3**

Schools A and D recorded similar responses in both phases. The researcher discussed this feature with the teacher at school D. It was apparent that the teacher had not used any of the strategies discussed in phase 1. She felt that her usual teaching strategies were effective enough and did not require further development. The teacher believed that there were certain issues, attendance for example, that were beyond the scope of her teaching. Her responses in phase 2 came without sight of her responses in phase 1. This reflects a consistency in approach and perhaps a resistance to making any changes.

The researcher reflected on his own responses. These too were given without sight of the phase 1 data. The interview with the teacher at school D had helped the researcher to reflect on his own practice. He could empathise with her responses. Both were experienced teachers who were effective in their practice with this particular group of pupils. The opportunities to make a more positive response were limited. For example, to move motivation and attendance from a 5 to a 6; 5 represents “most of the class in most lessons”, 6 represents “all of the class in every lesson”.

School C records an increase in the pupils’ ability to remain on task and that lessons had become less problematic. The teacher reported that his awareness of critical inputs / timing had been raised in our discussion of the teaching strategies in phase 1. At first he felt that the re-focussing strategies he was using were preventing the lesson from flowing, they were “artificial, bolt-ons”. He was conscious of using the strategies. However he persevered and the re-focussing strategies were now developed as natural parts of his teaching methodology. There was scope to develop his teaching methodology further. He was certain that there was a clear link between using the re-focussing activities at critical times in the lesson and the increase in the pupils’ ability to remain on task.

Reflecting on his teaching methods, he stated that using the pupils’ work as a teaching aid made the lesson more relevant. The pupils had previously reacted

negatively to written work – the theory lesson. He had now begun to merge written work within a practical lesson. For example, when the projects were ready to have a finish applied the pupils researched and recorded information about finishes. At the start of a project the pupils researched and recorded information about relevant materials. The increase in the pupils' ability to remain on task contributed towards the lesson being less problematic. The pupils were less confrontational.

School B recorded the most significant movement toward a more positive perception of the group. The teacher had attempted to use a variety of the teaching strategies discussed in phase 1. As a result he felt that the motivation of the group had increased significantly. This in turn led to an improvement in their behaviour, their ability to remain on task and the quality of the relationship between pupils and the teacher. In phase 1 the teacher felt that there were no pupils in the group who could achieve a grade C at GCSE. In phase 2 he had identified 2 pupils who could achieve a grade C.

The teacher stated that the discussion of the teaching strategies in phase 1 had contributed to making him far more reflective. In phase 1 he found teaching the group very demanding. It was an experience that he "did not look forward to". He reported that being more aware of timing was a major factor in improving the effectiveness of his lesson. Previously he would plan a lesson and stick rigidly to the lesson plan. He could not see or would ignore opportunities for learning that arose out of what was taking place in the lesson. Now he used naturally occurring opportunities for learning more fluently. The pupils responded positively because they had created the opportunity themselves.

For example, he had planned a practical lesson; the aim was to develop practical skills and to understand the relationship between a joint's surface area and its strength. The pupils had difficulty in using a tenon saw to cut a straight line to make a lap joint in 50mm x 20mm softwood. The group became frustrated. Previously he would have carried on with the original lesson as planned. The outcomes would have been a source of disappointment and

embarrassment to the pupils. This would have been reflected in the pupils acting negatively and the lesson deteriorating. His first reaction was to give another demonstration. He invited pupils to suggest better ways of carrying out the task. The lesson developed into a positive discussion of jigs. The pupils developed jigs to help them saw more accurately. The aims of the lesson were met and the concept of using jigs was explored. The pupils were engaged in learning because they perceived the lesson as being relevant to them at the time. A month later the pupils were looking at a question about jigs in a past GCSE paper. The majority of the class were able to make a response to the question because of their experience in the previously mentioned lesson.

**Research question 4 - *Had the perceptions of the staff at the three schools regarding the relevance of design and technology changed?***

The data is presented below in figure 8g. The responses to questions A, D and E are similar in both phases. The other questions are divided into 2; the top half records the phase 1 response and the bottom half the phase 2 response. When there is a change in response, the response is recorded in bold and discussed in the text below.

Figure 8g	Rating scale to compare responses – 6 is high	6	5	4	3	2	1
	How design and technology is perceived by:						
<b>A</b>	Senior management	A		D C	B		
<b>B</b>	Staff		A	DC	B		
		<b>A</b>	<b>DC</b> <b>B</b>				
<b>C</b>	Pupils	A	CD	B			
		<b>D</b>	<b>B</b>				
<b>D</b>	Parents	A	D	BC			
<b>E</b>	Community	A		DC		B	

The three teachers all felt that they could only comment on their perceptions and the perceptions of the pupils. The other categories would require more

time to assess if there had been any impact. The author moved his own response to the highest category because he felt that not only was the subject extremely relevant but that it offered so many opportunities to create relevant situations. The other teachers also perceived the subject as more relevant in phase 2. The teacher at school B also believed that the pupils perceived the subject as more relevant.

**Research question 5 - Which strategies, if any, did the staff at the three schools feel most effective in promoting the relevance of the subject**

The data is presented below in figure 8h. The questions are divided into 2; the top half records the phase 1 response and the bottom half the phase 2 response. When there is a change in response the response is recorded in bold and discussed in the text overleaf.

Figure 8h	Rating scale to compare responses – 6 is high	6	5	4	3	2	1
	Teaching						
A	Have you ever reflected on your own teaching methodology?	A D		C B			
		<b>C B</b>					
B	Have you ever reflected on the issue of relevance?	A		D C B			
		<b>C B</b> D					
C	Have you ever consciously attempted to make a lesson more relevant?	A	D	C	B		
D	Have you ever considered the relevance of the subject matter?	A D		B C			
		<b>CB</b>					
E	Are lesson aims made explicit at the start?	A D B C					
F	How aware are you of timing in a lesson?	AD	C	B			
		<b>CB</b>					

Figure 8h Cont.	How frequently in a lesson do you use the following:	6	5	4	3	2	1
G	1. Immediate relevance	A D	B C				
	2. Real world	A D	C	B			
		<b>B</b>					
	3. Future career	A	D C		B		
			<b>B</b>				
	4. Future life	A	D C		B		
			<b>B</b>				
	5. Health and safety	A D B C					
	6. Use of praise	A D	C	B			
			<b>B</b>				
	7. Exemplar material	A D	C		B		
		<b>B</b>					
	8. Reduce fear of mistakes	A C	D		B		
			<b>B</b>				
	9. Self assessment / group assessment	A C		D	B		
		<b>B</b>					

*A - Have you ever analysed your own teaching methodology?* In Phase 1, teachers at school B and C said that they had not reflected on their teaching methodology since they were student teachers. Taking part in the action research had made them more aware of their methodology and their classroom practice. They now regularly reflected on lessons, not just with the specific group but also with other classes.

*B - Have you ever reflected on the issue of relevance?* In phase 1 teachers at the other 3 schools had registered a degree of reflection on the issue of relevance. Taking part in the action research had raised their awareness of the issue. Inevitably they would have thought about relevance more because it was a key factor in the research.

*C - Have you ever consciously attempted to make a lesson more relevant?* Phase 1 found a range of responses to this question. The teacher at school B

recorded the weakest response in Phase 1. In Phase 2 all the responses had moved to the highest category. Each teacher had consciously attempted to make his or her lesson more relevant. The teacher at school D recorded little change in most of her responses. However, she agreed that she was now attempting to make her lessons more relevant. She believed that it was having a positive effect on the lesson. The teacher at school B recorded the greatest amount of movement, from category 3 to 6. He too believed that there was a positive effect if the pupils perceived the lesson as being relevant.

*D - Have you ever considered the relevance of the subject matter?* Both school B and C recorded a movement from category 4 to 6 after taking part in the action research. The reasons given were similar. They reported that taking part in the action research had raised their awareness of their own teaching practice. Both agreed that the issue of perceived relevance appeared to be a factor in engaging the pupils in learning. Reflecting on the relevance of the subject matter of the lesson was another strategy that could improve the relevance factor of the lesson. For example, both now encouraged the pupils to find projects for themselves and to then guide them into manageable areas, whereas before the project theme would be fully prescribed.

*E - Are lesson aims and objectives made explicit at the start?* No change.

*F - How aware are you of timing in a lesson?* The teacher in school B identified this as a very significant factor. He stated that the research project had made him more aware of how he could re-focus a lesson by being “more in tune with the pupils”. He used to plan timings of lessons and then attempt to impose them on the class. When he was a pupil in school himself this is how the lesson developed; some pupils finished sooner than others and then waited “relatively patiently” for the rest to finish. He agreed that his experience of school and his peer group differed significantly from this particular group. His group belonged to the upper sets in a grammar school; this group belonged to the bottom set in a comprehensive. The notion of the class making progress from one task to the next together did not apply in this context.

The teacher at school C had also become more aware of timing. He stated that taking part in the research had made him more aware of his practice in general. The experience had made him reflect and analyse what was going on in his lessons. He acknowledged that this in turn identified areas that could be developed. Timing was one such area.

*G – How frequently in a lesson do you use the following?*

*Immediate relevance* - No change; responses in Phase 1 were high

*Real world* - The teacher at school B reported that he utilised this strategy significantly and to good effect. The class responded positively when he introduced a reference to the real world. For example, a materials lesson on alloys, fibreglass and chrome plating became far more relevant when discussed in the context of car “pimping”, (the practice of achieving a customised appearance). For the first time that he could recall the pupils asked for more information.

*Future career / Future life* – The teacher at school B also utilised this strategy. He had become more in tune with the pupils. Many of them were interested in cars and careers in auto mechanics. Using materials, tools and machines were going to be relevant to them in their future career. He had introduced using the band saw to the group as though it were a car. It was dangerous, needed skill to operate, needed to be treated with respect and introduced a test of proficiency that had to be completed before the band saw could be used.

*Health and safety* – no change.

*Use of praise* – The teacher at school B reported that he did use praise more but that was not as a result of developing it as a strategy. He believed that he used praise more because the pupils were more worthy of it. The work and the quality of relationship had improved.

*Exemplar material / Self-assessment / group assessment* - The teacher in school B identified these as significant factors that worked together. He had

planned his lesson to use exemplar work from the group or from the previous year's group. The pupils responded positively. It helped the pupils understand what to expect. They could see the best work that was possible, or work that could be bettered, or work that did not meet their standards. Using the exemplar material was an essential component in their understanding of self-assessment. They could see work that they could identify with. Pupils would readily critically evaluate work from the previous year but be reluctant to openly criticise work within the group.

*Reduce fear of mistakes* - The teacher at school B reported that the climate within the group had become more positive. He actively reassured when genuine mistakes were made. This made pupils more amenable to confessing when a mistake had been made. For example, he was certain that in a practical activity when a mistake was made there were 3 possible outcomes: a confession of the mistake, a declaration that the mistake had been "lost" or "stolen" or a furtive swap of the mistake with another pupil's work. The confession was unlikely, the declaration time consuming and the furtive swap a portent of confrontation.

## **8.5 Conclusions**

The purpose of the semi-structured pupil interviews in phase 2 was to find out:

*How relevant was design and technology perceived by the pupils in these three schools after the strategies were implemented?*

Pupils at schools A, C and D had positive perceptions of the subject in Phase 1. This data was then compared to the data returned in phase 2. There are some movements in perception at these schools. School A's negative perceptions appear to become polarised. There are some indications of pupils developing a more positive perception in some questions. However, School B records the greatest movement towards a more positive response to the questions. There could be many reasons for this movement. The size of the sample is significant. If 3 pupils change their response there is a noticeable

effect in the results. School B recorded the most negative responses in phase 1 and therefore had more scope to develop a more positive perception. The teacher had a further 2 terms to develop a more positive relationship. The nature of the work became more meaningful to the pupils. The teacher had a further 2 terms to develop his teaching skills. Phase 2 could have been at a time when there was a focus on more practical work. The composition of the class could have altered.

It is possible that all these factors may have an influence on the movement in the responses at school B. These factors may act singly or in combination, and with various weightings within those combinations. The above findings could not be used alone to establish if the use of the teaching strategies to promote the relevance of design and technology at school B had an effect on the pupils' perceptions. At this stage all these findings report is that there appears to be a more positive perception of design and technology at school B.

In order to establish if the implementation of the teaching strategies to promote the relevance of design and technology had any influence on this data the findings from the other research questions will need to be analysed.

*Had teachers' attitudes toward the focus group changed? Had there been any change in the perceptions of the teachers at the three schools regarding the pupils' ability to engage in learning?*

There was little significant change in schools A, C and D. However, the teacher at school B recorded a significant movement toward a more positive perception of the group. As a result of using a variety of teaching strategies discussed in Phase 1 the motivation of the group had increased significantly. This in turn led to an improvement in their behaviour, their ability to remain on task and the quality of the relationship between pupils and the teacher. The discussion of the teaching strategies in phase 1 had contributed to making the teacher at school B far more reflective. Becoming more aware of timing was a major factor in improving the effectiveness of his lessons.

*Had the perceptions of the teachers at the three schools regarding the relevance of design and technology changed?*

The three teachers all felt that they could only comment on their perceptions and the perceptions of the pupils. The other categories would require more time to assess if there had been any impact.

*Which strategies, if any, did the staff at the three schools feel most effective in promoting the relevance of the subject*

In Phase 1, teachers at school B and C said that they had not reflected on their teaching methodology since they were student teachers. Taking part in the action research had made them more aware of their methodology, their classroom practice and the issue of relevance. It would appear that taking part in the research had a positive impact on how both teachers reflected on their practice.

Phase 1 found a range of responses to the question, "*Have you ever consciously attempted to make a lesson more relevant?*" In Phase 2 all the responses had moved to the highest category. Each teacher had consciously attempted to make his or her lesson more relevant. The teacher at school B recorded the greatest amount of movement, from category 3 to 6. He believed that there was a positive effect if the pupils perceived the lesson as being relevant.

Both teachers at schools B and C reported that taking part in the action research had raised their awareness of their own teaching practice. They agreed that the issue of perceived relevance appeared to be a factor in engaging the pupils in learning. Reflecting on the relevance of the subject matter of the lesson was another strategy that could improve the relevance factor of the lesson. They now encouraged the pupils to find projects for themselves and to then guide them into manageable areas, whereas before the project theme would be fully prescribed.

The teacher in school B identified timing as a very significant factor. The research project had made him more aware of how he could re-focus a lesson by being “more in tune with the pupils”. The teacher at school C had also become more aware of timing. He stated that taking part in the research had made him more aware of his practice in general. He acknowledged that this in turn identified areas that could be developed. Timing was one such area.

The teacher at school B reported that he utilised the “*real world*” strategy significantly and to good effect. The class responded positively when he introduced a reference to the real world. Many of them were interested in cars and careers in auto mechanics. Using materials, tools and machines were going to be relevant to them in their future career. The teacher at school B reported that he did use praise more but that was not as a result of developing it as a strategy. He believed that he used praise more because the pupils were more worthy of it. The work and the quality of relationship had improved.

The use of “*Exemplar material / Self-assessment / group assessment*” were identified by the teacher in school B as significant factors that worked together. The pupils responded positively. It helped the pupils understand what to expect. They could see the best work that was possible, or work that could be bettered, or work that did not meet their standards. Using the exemplar material was an essential component in their understanding of self-assessment. They could see work that they could identify with. Pupils would readily critically evaluate work from the previous year but be reluctant to openly criticise work within the group. The climate within the group had become more positive.

## Chapter 9 - Conclusions

*In this chapter the following are discussed: reflections on the methodology used, a statement regarding the limitations of the work, a summary of the findings, a summary of the contribution to knowledge and potential questions for future research.*

### 9.1 Reflections on the methodology used

Gathering data from a target group with low self-esteem and low levels of literacy generated unique methodological challenges. As a teacher researching into his own practice five key issues emerged that supported development of the methodology:

- Background reading
- The formation of a Delphi group
- The importance of piloting all aspects of the interviews and observations
- Ethical awareness in practitioner research
- Academic support to sustain reflexivity

Background reading to inform decision-making and to raise awareness of potential problems was an essential part of the process. The aim of the literature review was to provide a clear, balanced picture of current leading concepts, theories and data relevant to the methodology used. The method of achieving this aim was similar to Hart's, (2003) recommendations. Published books were skim read and relevant sections highlighted. The references from these sections were then used to identify further reading. This process was repeated for the newfound reading. Records of the references that contributed directly to the research were updated at regular intervals.

As a practitioner researcher working from home, rather than in a university environment, electronic e-journals proved particularly accessible. Access to Loughborough University's library facilities via the Internet was also essential. The Internet allowed access to the work of fellow researchers. This included

abstracts, theses, bibliographies and conference proceedings. A major factor in carrying out the review was time management, therefore a balance needed to be struck between carrying out the literature review and doing the research. This balance was achieved through the concept of “Sufficiency”, (Denton and Norman, 2004). “Sufficiency” in this context can be described as when new factors emerge less frequently.

The formation of a Delphi group to act as a soundboard, to check and to advise the direction of the research was also vital. As a reflective practitioner carrying out action research it was inevitable that a range of researchable issues would emerge. The practicalities of doing the research – relevance, time, fulfilling professional duties – meant that the range of researchable issues needed to be focussed. The researcher developed criteria to prioritise the issues that emerged. The criteria were based on the practicality of doing the research. However, there was a danger that the research could be overly influenced by the researcher’s own bias towards a particular range of issues. Action was taken to alleviate this through carefully planned discussion with other people who were part of the research; in this case, teaching colleagues and support staff.

The Delphi group was utilised to explore issues emerging during the action research and to limit the danger of single observer bias. The group participated in all aspects of developing the interview methodology: from formulating the schedules for both unstructured and semi-structured interviews, to executing some interviews themselves to avoid the problem that as a teacher researcher, one’s presence may influence pupil responses, (Hammersley, 1993:219).

The teacher / practitioner researcher led the research but the Delphi group’s overall contribution cannot be underestimated. By completing delegated tasks they had a positive impact on the time management of the research. Schools are encouraged to develop skills of self-reflection, planning and acting. These are almost identical to Hopkins’, (1985:55), model of action research. Using this approach practitioner research can be described as an extension to professional practice and a way of extending normal reflective activity. Utilising

the Delphi group in this way also resonated with the democratic and participatory nature of action research, (Cohen *et al*, 2000:230).

The importance of piloting all aspects of the interviews and observations - the questions, structure, timing, recording, execution and analysis - cannot be emphasised enough. Wragg, (1984:189) strongly recommends that interviews should be piloted. At the start of the research the piloting focussed on the researcher's skills. The aim of these pilot interviews and observations was to:

- Evaluate the interviewing / observation technique with a group of similar pupils
- Assess the effectiveness of the interview questions / observation schedule
- Assess the methods of recording

Two separate pilot interviews and a pilot observation were carried out to address the above aims. Implementing the piloting activities also created opportunities:

- To gain experience and confidence in interviewing / observation techniques and questions, and to reflect on their effectiveness
- To receive feedback from the Delphi group regarding the interview / observation technique, the interview questions and the observation proforma
- To receive feedback from the pupils regarding the interview technique, the interview questions and the observations recorded

This posed further questions: *How does the researcher evaluate her / his technique? What criteria should be used to evaluate against?* Kvale, (1996:30), Woods, (1996:91), The British Educational Research Association, (BERA, 1992), set of ethical guidelines, Loughborough University, (1999), ethical guidelines, and Radnor, (2002:59 – 67) all advise on the characteristic features that should be evident in a qualitative research. These were combined to produce a useful framework against which to evaluate the skills.

The notion of “active listening” was identified as an important factor in the interviewing process. Bird *et al*, (1996:90), emphasises developing skills of reflection, observation, listening and recording. Each interview should build into and inform the next. Ball, (1990:157-171) comments that to establish a rapport with the participants is critical. The author would add “reacting” as another essential skill - a critical awareness of what was happening and the confidence to make amendments to the original plan. A key factor in the success of the pilot semi structured interview was the ability to react to the pupils’ initial negativity towards the task. The act of interviewing was probably made easier for the researcher in this context due to his position as a teacher of twenty years’ experience at the school. There was an existing understanding and empathy with the pupils. This would have to have been constructed by an external researcher.

The pilot observations identified limitations that needed to be addressed. There would be a need to clarify the raw information recorded on the observational schedule and that created an opportunity to deepen understanding. Denzin, (1997:300), develops the notion of methodological triangulation. Triangulation between methods involves the use of more than one method in the pursuit of a given objective. One of the commonest forms is to combine interviews with observation. (See, Woods, 1979, and Lacey, 1976). The pupils were used to verify the accounts of the observers. They reacted positively at all 4 schools. It gave them a sense of acknowledgment and they could recognise the account of the lesson. They felt as participants, not subjects.

Teachers researching practice in their own school have a wide range of ethical issues to consider before the research begins and will become aware of additional ethical issues as the research continues. The shift in emphasis from seeing participants as samples or representatives of the population to seeing participants as subjects, and the provision of legal frameworks such as the Children Act 1989 and The Data Protection Act 1998, have undoubtedly moved the ethical debate to centre stage. Radnor (2002:34) believes that her

model of interpretive research *should* be “ethics in action: dignity and respect for participants”. Add to this model the legal implications and perhaps it would be fair to say that research *must* be “ethics in action”.

In this research an ethical checklist was developed. This was then used in planning the specific sections of research. This checklist also acted as a quality control / quality assurance measure throughout the research. The checklist was an active document and was continually upgraded on the basis of on-going professional reflection during the practice of the action research project.

Reflexivity is a key mechanism for rigour in the analysis of data. This was sustained by academic support from a tutor and also through the publication of peer reviewed articles in academic journals. Bird et al, (1996:90) emphasise the role of the researcher’s self: The importance of developing skills of reflection, observation, listening and recording, the art of “mentally photographing and logging for commitment to written record”. The development of any skill requires practice and arguably the presence of a third party that might act as a coach or mentor. Lacey, (1976:114) begins his “Review of the Methodology for Hightown Grammar” with: “To write about one’s own methodology and the problems of doing empirical research is inevitably to make gross assumptions about one’s own theoretical orientations and even one’s biography”. Who the researcher is influences how reality is interpreted and constructed. Radnor, (2002:3) writes: “We interpret experiences through the filters of existing knowledge and beliefs, and these existing knowledge and beliefs that we hold are a product of ourselves as active subjects construing meaning”.

Ball, (1990:157-71) comments that awareness of self provides part of the mechanism for rigour in the analysis of data. “The basis of this rigour is the conscious and deliberate linking of the social process of engagement in the field with the technical process of data collection...I call this linking reflexivity.” Recognition and awareness of the researcher’s effect on the process of collecting data is vital. The research strategies must be themselves

researchable. Data are social constructs, a product of the skills and the imagination of the researcher and of the interface between the researcher and the researched. However, recognition and awareness of these issues are not enough. The key factor is how to manage these issues. As a teacher researcher, remote from an academic community, the support of a tutor was particularly significant in developing strategies to manage these issues.

## **9.2 Limitations of the research**

A common way to conceptualise the diversity in approaches to research is the distinction between the 'scientific / hypothetico' paradigm or the illuminative paradigm. Each has its strengths and limitations. However, in the context of this research the illuminative paradigm and qualitative methodologies were more appropriate. Quantification means to measure on some numerical basis. A qualitative approach, by contrast, emphasises meanings and experiences. This is a very simplistic definition as there are diverse forms of both kinds of approaches. The researcher's position as a practitioner researcher limited the potential to measure on some numerical basis to his own setting. Atkinson, (1995:38), for example, used a sample from eight schools that involved 112 pupils. Quantitative techniques have a disadvantage. To make the resulting data statistically meaningful a large number of people would need to be tested and the sample crosschecked to ensure that it was representative. This would pose an operational problem in the context of this research. Bird et al, (1996:16) describe qualitative methodology in terms of a methodology that would fit the researcher's circumstances as a practitioner researcher. The method is characterised by exploring phenomena as opposed to testing hypothesis; it is more open ended and less structured. Typically qualitative methodology involves a small number of cases that are investigated in detail and the analysis of results relies on interpretation of meanings.

The samples in this research were small,  $n = 15$  in each of the schools. If a group of 5 pupils gave a response based on a misunderstood question it would constitute a 33% difference. Rating scales also have limitations. The recorded responses may not accurately reflect what the respondents' opinion might be.

There may be other factors that contribute to the difference in response. Brochocka *et al*, (2001:23-29) Growney, (1996:75-79), and Atkinson, (1993:17–25) all found that their samples did not perceive design and technology as being relevant. Their samples were based on mainstream mixed ability classes. This sample is focussed on low ability and disaffected pupils. The career aspirations of the pupils would also impact on their perception of the relevance of a subject.

As a practitioner researcher the author has a role within the school that sets serious time and movement constraints on his availability to carry out the research. This may give rise to the temptation to see his “snap shots” of a situation as being wholly accurate. A subjectivist approach to the research would seem an inevitable perspective to adopt. Historically this perspective may have been problematic but it would appear that the subjectivist approach has gained an acceptable level of respectability providing it is managed correctly.

Recognition of these perspectives was not sufficient. There were other checks and balances that helped the researcher guard against the potential ethical problems associated with bias. Fraser, (1997:2) argues that “practitioner” researcher has a professional obligation to the subjects of the research. In this research there was a professional obligation to pupils, parents and staff. The research was supervised externally and aspects published as the work proceeded. A biased line of reasoning could have been identified and challenged by supervisors and peer review. Respondent validation helped guard against the researcher’s own personal bias predominating.

Transparency also supported research methodology: the reader was given all the information necessary to help them make judgements on the data and conclusions drawn from the research. In interviewing and observation details were recorded of where and when the interview or observation took place, the number of people involved, the time of day and even the relevant weather conditions. This enabled the reader to make their own judgements as to the quality and limitations of the data.

Other limitations need to be acknowledged. Pupil attitudes can change significantly over a period of time. Some may have developed more positive attitudes as they matured. This could have occurred without the influence of the teaching strategies. The aims of the research were always shared with participants. This can cause the “Hawthorn effect”, (Cohen et al, 2000: 303). Being part of the research could have inclined staff and pupils to make particular responses.

### **9.3 Summary of findings in relation to the research questions**

***What are the factors in design and technology lessons that contribute to low ability pupils being engaged in learning? What features do staff perceive as being significant in the process of motivating disaffected and low ability pupils to engage in learning in design and technology lessons at this school?***

Many factors were identified as being significant for this specific group in case study 1: the quality of relationships, the relevance and practical nature of the subject, developing self-esteem and confidence, improving social skills and behaviour, timing and lesson management, use of exemplar work, group work, and options / compulsory subjects. All of these identified factors could have the potential to motivate disaffected and low ability pupils to engage in learning. The factors could contribute directly individually or in various combinations and with different weightings within these combinations. All of the identified factors are worthy of further research.

The discussion in case study 1 examined these contrasting factors with findings in the literature. Comparison of the factors identified in the literature review with those identified in the case study highlighted discrepancies and hence problematic areas on which to focus research. Those factors identified in the literature review and confirmed by the case studies could be assumed to be of very low priority for further research. However, evidence relating to them might have emerged during the action research programme and could have been usefully reported in the final thesis.

There were many instances where the literature strongly matched the findings of the focussing case studies. However, there were some notable themes that appeared not to match. The issue of perceived relevance stands out as being particularly prominent. The literature found that the sample of pupils that had formed the basis of the research had a low perception of the relevance of design and technology. This may have occurred for several reasons. For instance, the academic profile of the samples might have been different; the aspirations of the pupils might have been different.

### ***What are the pupils' perception of design and technology at this school?***

The data gathered at this school appeared to show the subject as being perceived as positively relevant by this sample of low ability disaffected pupils. Had the whole school population been sampled the overall result may well have resonated more closely with the literature.

### ***How do pupils at this school understand the word relevant?***

In case study 2 pupil understanding of the term relevant / relevance was explored. The pupils subscribed to two definitions; *“relevant” connected to the present, situational*; *“relevant” preparation for a particular purpose*. Which interpretation did the pupils favour?

Pupils favoured the first definition but most agreed with both definitions. The fact that there was greater agreement with the situational definition resonates with Goleman, (1996:83) and Mischel (1989). The sample would be low in emotional intelligence or emotional self-regulation and the ability to deny impulse in the pursuit of a particular goal. A sample with higher ability may favour definition (B). They might perceive relevance more in terms of preparation for a future purpose.

It should be acknowledged that pupils could perceive the term “relevance” in different ways. Pupils in the case study school sample had a positive

perception of the relevance of design and technology, irrespective of definition. The semi-structured interviews provided data that reflected a positive perception of the subject's relevance and indicated the intensity of feeling.

***As a result of these interpretations and understandings, what subjects do the pupils perceive as being relevant?***

Pupils in the sample perceived design and technology as very relevant, rated more highly than English, mathematics and science. Compulsory subjects such as RE and Welsh were rated least relevant.

***What factors can be identified in design and technology classroom practice that contribute towards pupils having a positive perception of the relevance of design and technology at this school?***

In response to this research question the answer appeared to be that in the observed design and technology lessons at the researcher's school the use of relevance was systematic, and explicit. The observers reported that the children were told in each lesson, throughout each lesson and clearly during each lesson that design and technology was relevant to them. This persistent reminding was reinforced by tangible, relevant activity within the lessons observed. There are similarities with critical point inputs – a short, focussed teaching strategy that supports learning.

***What factors can be identified in departmental documentation - policies, development plans and schemes of work - that contribute towards pupils having a positive perception of the relevance of design and technology at this school?***

In response to this research question the answer appeared to be that relevance was not explicitly written in. In the observed lessons at the researcher's school the observers found that the teacher's use of relevance was "systematic and explicit", yet the documentation did not display a structure that reflected this pedagogy.

The Delphi group reflected on case study 3 and identified a series of factors that contributed to the systematic and explicit references to relevance. These included:

- Before the lesson starts - the subject matter was made relevant to the pupils
- At the start of the lesson – the aims were explicit, short-term; the teacher checked for understanding
- The activities were timed, gauged by pupil engagement to the task
- Re-focussing or critical inputs took place at key points throughout the lesson;
- There was use of praise and use of exemplar material
- The fear of making mistakes was lessened
- Self-assessment and group assessment were encouraged.

***What perceptions of the term “relevance” did the pupils at the three schools have?***

***How did these perceptions compare with those of the pupils at the researcher’s school?***

***How relevant was design and technology perceived by the sample pupils in these three schools before the strategies were implemented?***

The Action research phase visited three different secondary schools, to assess the effectiveness of the identified teaching strategies. The strategies set out to make design and technology lessons more relevant to low ability disaffected pupils and in doing so increase their engagement in learning. The 3 different schools were a single sex girls’ school, a boys’ school and a church school.

There were strong similarities in profile between school D and the researcher’s school. Conversely school B appeared to have a profile that was farthest away from the researcher’s school. The pupils at school B appeared to favour the deferred definition of relevance – *for a particular purpose, to get a job*. This difference could be due to a range of factors: school ethos, aspirations of the pupils and their parents and the size of sample.

School D's profile was very similar to school A, the researcher's school. Many of the teaching strategies recommended in the discussion with the teacher appeared to be well used at school D, with the exception of self-assessment. Further research at this school could support the findings at the researcher's school. School C could also support some of these earlier findings. This school occupied the middle ground; its profile was less similar to the researcher's school than school D. School B's teaching methodology appeared the least similar to the researcher's school. Many of the teaching strategies that promote relevance identified in the previous case study were not used, or possibly not recognised, by the teacher at that school. School B had the least experienced teacher who had taught for the least amount of time at the school. He had less time to develop a relationship with the pupils. These may be factors that contributed to the differences that were identified.

***How relevant was design and technology perceived by the pupils in these three schools after the strategies were implemented?***

The next phase of this action research project revisited schools A, B, C and D to establish what impact, if any, these identified teaching strategies had in promoting the relevance of design and technology.

Pupils at schools A, C and D had positive perceptions of the subject in Phase 1. This data was then compared to the data returned in Phase 2. There were some movements in perception at these schools. School A's negative perceptions appeared to become polarised. There were some indications that pupils had developed a more positive perception in some questions. However, School B recorded the greatest movement towards a more positive response to the questions. There could be many reasons for this movement. The size of the sample is significant - if 3 pupils changed their response it would have a noticeable effect on the results. School B recorded the most negative responses in Phase 1 and therefore had more scope to develop a more positive perception. The teacher had a further 2 terms to develop a more positive relationship. The nature of the work became more meaningful to the

pupils. The teacher had a further 2 terms to develop his teaching skills. Phase 2 could have been at a time when there was a focus on more practical work. The composition of the class could have altered.

It is possible that all these factors may have had an influence on the movement in the responses at school B. These factors may act singly, or in combination, and with various weightings within any combination. The above findings could not be used alone to establish if the use of the teaching strategies to promote the relevance of design and technology at school B had an effect on the pupils' perceptions. These findings suggest that there appears to be a more positive perception of design and technology at school B.

***Had there been any change in the perceptions of the staff at the three schools regarding the pupils' ability to engage in learning in design and technology?***

In order to establish if the implementation of the teaching strategies to promote the relevance of design and technology had any influence on this data the findings from the other research questions were analysed. The teacher at school B recorded a significant movement toward a more positive perception of the group. As a result of using a variety of teaching strategies discussed in Phase 1 the motivation of the group had increased significantly. This in turn led to an improvement in their behaviour and their ability to remain on task, and in the quality of the relationship between pupils and the teacher. The discussion of the teaching strategies in Phase 1 had contributed to making the teacher at school B far more reflective. Becoming more aware of timing was a major factor in improving the effectiveness of his lessons.

***Which strategies, if any, did the staff at the three schools feel most effective in promoting the relevance of the subject?***

In Phase 1, teachers at school B and C said that they had not formally reflected on their teaching methodology since they were student teachers. Taking part in the action research had made them more aware of their methodology, their classroom practice and the issue of relevance. It would

appear that taking part in the research had a positive impact on how both teachers reflected on their practice. Each teacher had consciously attempted to make his or her lesson more relevant. The teacher at school B believed that there was a positive effect if the pupils perceived the lesson as being relevant. Reflecting on the relevance of the subject matter of the lesson was another strategy that improved the relevance factor of the lesson. The teachers now encouraged the pupils to find projects for themselves and to then guide them into manageable areas, whereas before the project theme would be fully prescribed.

The teacher at school B reported that he utilised the “*real world*” strategy significantly and to good effect. Using materials, tools and machines were going to be relevant to them in their future career. The teacher at school B identified the use of “*Exemplar material / Self-assessment / group assessment*” as significant factors that worked together. The pupils responded positively. It helped the pupils understand what to expect. Using the exemplar material was an essential component in their understanding of self-assessment.

#### **9.4 Summary of the contribution to knowledge**

Methodologically the thesis can contribute to the knowledge of practitioner action research. Practitioner action research is, by definition, located in a specific context. Whilst there will be similarities between contexts, each context has unique characteristics. Gathering data from a target group with low self-esteem and levels of literacy generated unique methodological challenges. Researchers who wish to carry out similar studies could use this thesis as exemplar material.

Harris & Wilson, (2003:59) found that despite the number of references to design and technology identified in the literature, few were research-based in terms of meeting peer review standards. Four sections of this research have already been independently published in academic journals after being peer reviewed. A tutor, supervisor and two assessors will have assessed the thesis as a whole. This would appear to address Harris & Wilson’s (2003) concerns

regarding the rigour of research in design and technology. The research could make a direct contribution to knowledge within the subject or substantiate claims from the literature that have not been peer reviewed.

There are themes in the thesis that address specific questions raised by Harris & Wilson, (2003) in their conclusions: *What are the most effective ways of learning within Design and Technology? How do effective teachers teach Design and Technology? How can opportunities for all, both pupils and teachers be extended in Design and Technology?* Many factors were identified as being significant in case study 1. The issue of perceived relevance was identified as a factor and explored. It was found that the pupils being investigated at this school perceived relevance in two ways: situational, and for future use. A series of strategies that were employed to promote the relevance of the subject were identified. The use of these strategies was then assessed in three different school settings. The findings from this action research showed that a relatively inexperienced teacher benefited significantly from using the identified strategies to structure and support his teaching.

The pupils indicated that they had found taking part in the research a positive experience. This would resonate with the sentiments expressed in the Every Child Matters Green Paper, (2003). This promotes in particular the idea that every child should enjoy and achieve and make a positive contribution. Staff taking part in the research reported that they had become more reflective. They had become more focussed on this particular group of pupils and this appeared to enhance the learning opportunities for the pupils.

### **Potential areas for future research**

Case study 1 identified several factors as being significant: the quality of relationships, the relevance and practical nature of the subject, developing self-esteem and confidence, improving social skills and behaviour, timing and lesson management, use of exemplar work, group work, and options / compulsory subjects. All of these identified factors could have the potential to motivate disaffected and low ability pupils to engage in learning. The factors

could contribute directly individually or in various combinations and with different weightings within these combinations. All of these identified factors are worthy of further research.

The teacher at school B commented that he used praise more because the pupils were working better and therefore deserved more praise. This could be an example of an upward spiral effect. Which issue came first; the teachers praise or the better work? Design and technology offers a wide range of opportunities for pupils to succeed. Succeeding develops self-esteem and confidence; these in turn impact on behaviour and performance. The participation of teachers in the research and the creation of enhanced teaching and learning opportunities could also be an example of an upward spiral effect. There are opportunities for teachers to participate in small-scale action research that could be linked directly to professional development through schemes such as Advanced Skills Teacher (AST) and Excellent Teacher (ET). Can the extent to which a teacher enhances the teaching and learning environment through rigorous professional reflection be assessed?

Other issues emerged that were of particular interest to the researcher but lay outside the scope and focus of this research:

- Low status – both design and technology and the low ability / disaffected pupil have an historical affiliation with low status in terms of how schools have valued them.
- Relationships– there is evidence in the literature that identifies the potential of design and technology teachers to be perceived as different to mainstream teachers, (Wellbourne-Wood, 1999, Hansen, 2000, Eggleston, 1996). Their arguments are based on issues of perceived lack of status. Hustler, *et al*, (1998) found that the disaffected pupils in that study favoured practical activities involving adults who were not teachers. Could this perception of the design and technology teacher as a ‘non teacher’ be a positive factor in forming working relationships with

a group of pupils that have had negative experiences with school and the teacher as traditional symbol of authority?

- The Crowther Report, (1959) discussed bridging the gap between education and industry. The Report attempted to change people's perception of the word "practical" as meaning the opposite to "academic". Crowther argues for an "alternative road" approach to education to enable the country to benefit from the capabilities of all young people. How far have we travelled down this "alternative road" in the last 48 years? What has been design and technology's contribution to changing the public's perceptions?
- The Newsome Report, (1963) examined education for "pupils of average and less than average ability". The report underlined the value of practical activities to these pupils. It recognised design and technology's ability to offer opportunities for learning by direct experience through a medium of expression other than the written word. The Report acknowledged that pupils achieve a sense of pride and satisfaction through positive experiences in the subject. However, "sense of pride" and "satisfaction" were not considered sufficiently educationally enriching. To what extent has the development of the 14 to 19 educational agenda and vocational courses addressed these issues?
- The issue of the "compulsory subject" - Design and technology became a compulsory subject at Key Stage 4 due to the inception of the National Curriculum in 1988. Research carried out by Brochocka *et al*, (2001:23-29) Growney, (1996:75-79), and Atkinson, (1993:17 -25) would have been based on samples that studied design and technology as a compulsory subject. All found that their samples did not perceive design and technology as relevant. This research was based in Wales where the sample opted for design and technology; the subject was not compulsory at Key Stage 4. However, case study 2, in chapter 5 of this research, shows negative pupil perception of compulsory Welsh. Could

there be a relationship between the English pupils' perception of compulsory design and technology in the 1990s and the Welsh pupils' perception of compulsory Welsh at the researcher's school? How could the impact of the introduction of a compulsory subject be measured?

## References

ACCAC, (2000) *Design and technology in the National Curriculum*  
HMSO

Adelman, C, Kemmis, S, and Jenkins D, (1980) Rethinking case study: notes from the second Cambridge Conference, in, Simons, H, ed. *Towards a science of the singular*, Centre for Applied Research in Education, University of East Anglia

Adey, P., Fairbrother, R., & William, D. (1999). *A review of research on learning strategies and learning styles*, King's College London

Adler. P.A and Adler. P. (1994) Observational techniques, in, Denzin, N.K. & Lincoln, Y.S. (eds) *Handbook of qualitative research*, Sage, London

Archer. B, (1986) The 3Rs, in, Cross, A. McCormick, H. Eds. *Technology in School*, Open University Press, Milton Keynes

Atkinson, S, (1993) Identification of some causes of demotivation amongst key stage 4 pupils in studying technology with special reference to D&T  
In, J. Smith ed. *IDATER*, 93, 17 – 26, Loughborough University

Atkinson, S, (1994) Key factors which affect pupils performance in technology,  
In, J. Smith ed. *IDATER*, 94, 30 –37, Loughborough University

Atkinson, S, (1995) Approaches to designing at key stage 4  
In, J. Smith ed. *IDATER*, 95, 36-47, Loughborough University

Atkinson, S, (1998) Cognitive style in the context of design and technology project work, *Educational Psychology*, 18 (2) 183 – 194

Atkinson, S, (1999) Key factors influencing pupil motivation in Design and Technology, *Journal of Technology Education*, 10 (3) 255 – 281

- Bailey, J, (1998) Medical and psychological models in special needs education, in, Clarke, C, Dyson, A, & Millward, A, eds. *Theorising special education*, Routledge, London
- Ball, S.J, (1990) Self doubt and soft data: social and technical trajectories in ethnographic field work, *International Journal of Qualitative Research*, Vol.3, no.2,157 –71
- Barlex, D. & Wright, R, (1999) The role of resources in an immersive cross curricular D&T activity, in, Roberts, P. and Norman, E., eds. *IDATER 99*, 12-19, Loughborough University
- BERA, (1992) British Educational Research Association, Ethical Guidelines, In, *Research Intelligence*, February 1989
- Berliner, D.C, (1985) Perspectives on instructional time: Conference Papers, edited by Charles W. Fisher and David C. Berliner, Longman, New York
- Bennet, S.N, Desforges, C & Wilkinson, E, (1984) *The quality of pupil learning experiences*, Lawrence Erlbaum Associates, London
- Biddulph, M.A.; Adey, K.; Pupil perceptions of effective teaching and subject relevance in history and geography at Key Stage 3, *Research in Education*, 71
- Bigge, M. L, (1988) *Learning theories for teachers*, Harper Row, London
- Bird, M. Hammersley, M, Gomm, R, Woods, P, (1996) E835, *Educational Research in Action*, Open University, Milton Keynes
- Blythe, E. & Milner. J, (1999) *Improving school attendance*, Routledge, London
- Bogdan, R.G. & Biklen, S.K, (1992) *Qualitative research for education*, second edition, Allyn and Bacon, Boston MA

Breckon, A, (2000) DfEE/DATA CAD/CAM in schools initiative: A success story so far, *The Journal of Design and Technology Education*, 3(2) 101-105

Butcher, H.J and Pont, H.B. Eds, (1973) *Educational Research in Britain*, University of London press, London

Bronfenbrenner, U, (1979) *The ecology of human development*, Harvard, Cambridge, Mass

Brochocka, K, Y, (2001) Pupil's views of school and popular culture, their opinions of design and technology at KS3 and their perception of its relevance for their futures, In, Norman, E.W.L. and Roberts, P.H, eds. *IDATER*, 2001, Loughborough

Burgess, S, (1998) Effects of group composition on individual learning / performance in design and technology: a case study approach, *The Journal of Design and Technology Education*, 1 (2) 101-109

Cambridge Advanced Learner's Dictionary © Cambridge University Press (2003)

Campbell, C. (1995) Theories of consumerism, ([www.socialsciences.man.ac.uk/sociology/course\\_materials/sy1402/BSC\\_Lecture7handout.doc](http://www.socialsciences.man.ac.uk/sociology/course_materials/sy1402/BSC_Lecture7handout.doc)) (15 June 2005).

Cannell, C.F. & Khan, R.L, (1968) Interviewing, in G. Lindzey and A Aronsen, (eds) *The Handbook of Social Psychology*, Vol. 2: Research Methods, 526-595 Addison Wesley, New York

Carr, W, (1987) What is an educational practice? in, *Journal of Philosophy of Education*, volume 22, no.2, 163-175, Carfax, Oxford

Carr, W & Kemmis, S, (1983) *Becoming critical: knowing through action research*, Geelong, Victoria, Deakin Press

Children Act (1989) - [www.opsi.gov.uk/acts/acts1989](http://www.opsi.gov.uk/acts/acts1989), accessed September 2005

Clarendon, W, (1864) Royal commission on Public Schools, Clarendon Report, 1864, HMSO

Cohen, L, & Manion, L, (1980) *Research Methods in Education*  
Routledge Falmer, London

Cohen, L, Manion, L & Morrison, K, (2000) *Research Methods in Education*  
Routledge Falmer, London

Corey, S.M, (1953) *Action research to improve school practices*, Teachers College, Columbia University, New York

Cox, E, (1995) ED209, *Child development*, Glossary 1, Open University, Milton Keynes

Crowther, J, (1959) Ministry of Education 15-18, HMSO

Dale, R. Ed. (1985) *Education, Training and Employment*, Pergamon Press, Oxford

Dale, R, (1986) In, Module 1, E333, *Introducing education policy: principles and perspectives*, Milton Keynes, Open University Press

Daniels, H., Visser, J., Cole, T., & de Reybekill, N, (1998) Emotional and Behavioural Difficulties in Mainstream Schools, in, Department for Education and Employment, Research Report, RR90 in,  
[www.education.bham.ac.uk/aboutus/profiles/inclusion/visserj/default.htm](http://www.education.bham.ac.uk/aboutus/profiles/inclusion/visserj/default.htm) - 61k  
- 20 Jul 2005

Data protection Act (1998) - [www.opsi.gov.uk/acts/acts1998/19980029](http://www.opsi.gov.uk/acts/acts1998/19980029), accessed September 2005

Davies, L, (2000) Design and Technology's contribution to the development of the use of language, numeracy, ICT, key skills, creativity and innovation and thinking skills, *The Journal of Design and Technology Education* 5(2) 166-170

Davies, L., Fox, J., Grover, M, & Mitchell, A, (2004) Approaches to teaching pupils with Behavioural, Emotional and Social Difficulties in Design and Technology, *DATA International Research Conference*

Davies, L, Jupe, J. & Perry, D, (2000) No bits no- nothing, *The Journal of Design and Technology Education*, 5, (1) 52 –54

Denton, H, (1992) *Towards maximising pupil endeavour: An enquiry into a learning approach centred on teamwork and simulation in the context of Technology education*, Unpublished PhD thesis, Loughborough

Denton, H, (1993) The design and make task: some reflections on designing in schools, in Smith, J. ed. *IDATER*, 1993, Loughborough University

Denton, H, (1994) Motivation levels in pupil's project work: observations from a series of case studies in the United Kingdom, in, *Journal of Technology Education*, 6 (1) 16 – 31

Denton, H, (1994) Critical inputs within on-going Design and Technology project work in, Smith, J.S. ed., *IDATER*, Loughborough

Denton, H, (1996) Developing design team working capability: some planning factors emerging from a survey of engineering design courses, in, Smith, J.S. ed. *IDATER*, Loughborough

Denton, H, (2003) Unpublished tutorial notes with research student

Denton, H, & Norman, E, (2004) Unpublished tutorial notes with research student

Deshler, D.D and Schumaker, J.B, (1990) Learning strategies: an instructional alternative for low achieving adolescents. In, Sigmon, S.B., ed. *Critical voices on special education: problems and progress concerning the mildly handicapped*, 155 – 166, State University of New York Press, New York

Deshler, D.D and Schumaker, J.B, (1993) Strategy mastery by at risk students: not a simple matter, *The Elementary School Journal*, 94, (2) 153-156

Data, (1996) (Pamphlet), Why D&T? DATA, Wellesbourne

Department of Education & Science, (1990) Technology in the National Curriculum Statutory Order, HMSO

Department for Education and Skills, (2000) School Teachers' Pay and Conditions Document 2000, DfES, London

Department of Education and Science / Welsh Office, (1988) *National Curriculum design and technology Working Group: Interim Report*, The Parkes Report, DfES, London

Department of Education and Science, (2002) Extending opportunities, raising standards, Green Paper, DfES, London

DfEE/QCA, (1999) National Curriculum for England, D&T, HMSO

Denzin, N.K, (1997) Triangulation in educational research, in, Keeves, J.P. (ed.) *Educational research, methodology and measurement: an international handbook*, (second edition), Elsevier Science Ltd., Oxford

Dewey, J, (1938) *Experience and education*, Macmillan, New York

Dobbs,L, Dodgson, R and Craddock,C, (2004), *What Teachers Think: The role of teachers in shaping young peoples attitudes to education in North East England*, Northumbria University

Dockrell, W.B. Ed (1988) In, Keeves, J.P.(Ed) *Educational Research, Methodology, and Measurement: an International Handbook*.  
Pergamon Imprint, Oxford

Dodd, T, (1978) *Design and technology in the school curriculum*, Hodder and Stoughton, London

Doll, W.E, (1993) *A post modernist perspective on curriculum*,  
Teachers College Press, New York

Down, B.K, (1986) Problem solving, CDT and child centeredness, in, Cross, A. & McCormick, B. eds, *Technology in Schools*, Open University Press, Milton Keynes

Education Act (1996) HMSO

Education & Employment Committee, (1997) *Disaffected children*, Volume 1  
HMSO

Eggleston, J, (1996) *Teaching Design and Technology*, Open University Press,  
Milton Keynes

Eisenhart, M. A. & Howe, K.R, (1992) Validity in educational research, in,  
Lecompte, M. D., Millroy, W. L. & Preissle, J., Eds, *The hand book of qualitative studies in education*, Academic Press, New York

Eisner, E, (1986) *The primacy of experience and the policy of method*,  
Lecture delivered at the University of Oslo, Norway

- Elliot, J, (1991) *Action research for educational change*, Open University Press, Milton Keynes
- Every Child Matters Green Paper, (2003) HMSO
- Featherstone, H. ed.(1986) Cooperative learning, *Harvard Education Letter*, September, 1986
- Fraser, D, (1997) Ethical dilemmas and practical problems for the practitioner researcher, *Educational Action Research*, 5 (1)
- Galton. M, Simon, B. & Coll. P, (1980) *Inside the primary classroom*, Routledge Keegan & Paul, London
- Geen, A, (2001) *Effective teaching for the 21<sup>st</sup> century*, UWIC Press, Cardiff
- Geertz, C, ed, (1973) *The interpretation of cultures*, Basic books, New York
- Glesne, C & Peshkin, A, (1992) *Becoming qualitative researchers: an introduction*, Longman, White Plains, New York
- Goffman, E, (1979) *Gender advertisements*, Macmillan, London
- Goleman, D, (1996) *Emotional intelligence*, Bloomsbury, London
- Good, T. & Brophy, J, (1987), *Looking in classrooms*, Harper Row, London
- Gold, R.L, (1958) *Roles in sociological field observations*, Charles Griffin & Co, London
- Greenhalgh, P, (1994) *Emotional growth and learning*, Routledge, London

Griffiths, G, (1985) Doubts, dilemmas and diary keeping: some reflections of teacher based research, in R. G. Burgess, (ed.) *Issues in Educational Qualitative Methods*, Farmer Press, 1985, Lewes

Gronlund, N.E, (1981) *Measurements and evaluation in teaching* (fourth edition), Collier Macmillan, New York

Growney, C, (1996) Gender inequality in design and technology...the pupils' perspective, in Smith, J. S. ed. *IDATER*, 1997, Loughborough

Gutteridge, D, (2005) Eaton (City of Norwich) School, Norwich, Norfolk, U.K.2005 [www.uea.ac.uk](http://www.uea.ac.uk),7/5/05

Habermas, J, (1974) *Theory and practice*, Heinemann, London

Hammersley, M, (1992) *What's wrong with ethnography?* Routledge & Kegan Paul, London

Hammersley, M, (1993) On the teacher as researcher, *Educational Action Research*, Vol.1 No. 3

Hammersley, M, (1995) *The politics of social research*, Sage, London

Hansen, R, Fliesser, C, Froelich, M, & McClain, J, (1992) *Teacher development project: technological education*, final report, University of Western Ontario, London Ontario

Hansen, R, (2000) The learning preferences and tendencies of technological education teachers, in, In,Norman, E.W.L. and Roberts, P.H, eds. *IDATER*, 2000, Loughborough.

Harris, M. & Wilson, V, (2003) *Designs on the curriculum*, Scottish Council for Research in Education, [Scre.ac.uk](http://Scre.ac.uk) (accessed, 2/9/03)

Hargreaves, D.H, (1967) *Social relations in a secondary school*, Routledge and Keegan Paul, London.

Hart, C, (2003) *Doing a literature review*, Sage, London

Heidegger, M, (1962) *Being and Time*, Harper Row, New York

Hirst. P. H, (1975) *Knowledge and the curriculum*, Routledge and Keegan Paul, London

Hitchcock, G and Hughes, D, (1995) *Research and the teacher (second edition)*, Routledge, London

Hopkins, D, (1985) *A teacher's guide to classroom research*, Open University Press, Milton Keynes

Hopkins, D, Bollington, R, Hewett, D, (1989) Growing up with qualitative research an evaluation, *Evaluation and research in education*, Vol. 3, No. 2

Hoyle, E, (1972) Creativity in the school, unpublished paper given at OECD workshop at Estoroli, Portugal, - quoted in Stenhouse, L, (1975) *An introduction to curriculum research and development*, Heinemann, London  
Human Rights Act (1998) HMSO

Hustler, D., Callaghan, J., Cockett, M, & McNeil, J, (1998) *Choices for life: An evaluation of Rathbone C.I.'s work with disaffected and excluded school pupils*, Manchester Metropolitan University, Manchester

HMSO, (1954) *Early Leaving*, HMSO

HMSO, (1963) *Half our Future*, HMSO

Judd, R.C, (1972) *Forecasting to consensus gathering, Delphi grows up to college needs*, College and University Business, 53, 36-38, 43

Keirl, S (1998) *The practise of ethics and the ethics of practice in technology education*, in, Smith, J. S. & Norman, E.W.L. eds, Idater, 2000, Loughborough

Kemmis, S, (1988) *Action Research*, in, Keeves, J. P. ed, in, Educational research methodology and measurement: an international handbook, Pergamon, Oxford

Kerlinger, F.N. (1973) *Foundations of Behavioural Research*, Holt, Reinehart and Winston, New York

Kimbell, R. & Perry, D, (2001) Design and technology in a knowledge economy, *Engineering Council, London*

Kimbell, R., Stables, K., Wheeler, T., Wosniak, A. & Kelly, V, (1991) *The assessment of performance in design and technology: The final report of the APU design and technology project 1985 –91*, Schools examinations and assessment council / evaluation and monitoring unit, London

Kimbell, R. & Stables, K, (1996) *Understanding practice in design and technology: developing science and technology*, Open University, Buckingham

Kimbell, R, (1997) *Assessing technology: international trends in curriculum and assessment in the UK, Germany, U.S.A., Taiwan and Australia*, Open University, Buckingham

Kinder, K., Wakefield, A., and Wilkin, A. (1996). Talking Back: Pupil Views on Disaffection, *National Foundation for Educational Research*, NFER Report, Slough

King, N, (1994) *The qualitative research interview*, University of Huddersfield

Koutsides, G, (1999) Using cooperative learning in design and technology, *The Journal of Design and Technology Volume 6, number 1*

Kvale, S, (1983) *The qualitative research interview: a phenomenological and a hermeneutical mode of understanding*, Journal of phenomenological psychology, 14: 171-96

Kvale, S, (1996) Interviews, Sage, London

Kyriacou, C, (1997) *Effective teaching in schools*, Stanley Thorne, London

Labov, W, (1969) The logic of non Standard English, Georgetown Monogr.

Lacey, C, (1970) *Hightown Grammar: the school as a social system*. Manchester University Press, Manchester

Lacey, C, (1976) *Problems of sociological fieldwork: a review of the methodology of "Hightown Grammar"*, in Hammersley, M. Woods, P. eds. The Process of Schooling, Routledge Keegan, London

Lave, J and Kvale, S, (1995) *What is anthropological research?* International Journal of Qualitative Studies in Education, 8(3) 219 –28

Lawson, J, and Silver, H (1973) *A Social History Of Education In England* Methuen, London

Leach, D.J. Ingram, K.L, (1989) *The effects of information and feedback on teachers' classroom behaviour and students' academic engaged time*, *Educational Psychology*, 9,3, 167-184

Lewin, K, (1952) Group decision and social change, in Swanson, G. E., Newcombe, T.M., and Hartley, E.L. eds. *Readings in social psychology*, Holt, New York

Lewis, A, (1992) *Group child interviews as a research tool*, British Educational Research Journal, 18 (4) 413-21

Le Compte, M. & Preissle, J, (1993) *Ethnography and qualitative design in educational research, second edition*, Academic Press, London

Likert, R, (1932) *A technique for the measurement of attitudes*, Columbia Press, New York

Lincoln, Y.S. & Guba, E.G, (1985) *Naturalistic enquiry*, Sage Publications, Beverly Hills

Linton, T & Rutland, M, (1998) *An investigation into the interaction of teaching and learning in primary Design and Technology*, *The Journal of Design and Technology Education*, 3 (3) 159 –165

Loughborough University Code of Practice in Investigations Involving Human Participants (revised July 2003).

<http://www.lboro.ac.uk/admin/committees/ethical/cophp.htm>, accessed September 2005.

Mac an Ghail, M, (1988) *Young Gifted and Black*, Open University Press, Buckingham

Mansell, W, (2003) *GCSE results reveal widening divide*, *Times Educational Supplement*, 22/08/03

Marzano, R.J, Brandt, R.S, Hughes, C.S, Jones, B.F, Preiseissen, B.Z, Rankin, S.C. & Suhor, C, (1988) *Dimensions of thinking: a framework for curriculum and instruction*, Association for supervision and curriculum development, Alexandria, VA

McNair, V, Dallat, J, & Clarke, R, (2000) *Effective teaching: questioning teacher's interactions with pupils in technology and design*, in, Roberts, P.H. and Norman E.W.L, eds. *IDATER*, Loughborough

Mead, G.H, (1934) *Mind, self and society*, University of Chicago, Chicago

Mischel, W., Yuichi S, and Monica L. R. (1989) 'Delay of Gratification in Children'. Chapter 6 of *Choice Over Time*, George Loewenstein and Jon Elster, (eds), Russell Sage Foundation, New York

Montague, M. & Graves, A, (1992) Teaching narrative composition to students with learning disabilities, in Pressley, M, Harris, K. R. & Guthrie, J.T. eds. *Promoting academic competence and literacy in school*, Academic press, San Diego

Morrison, K.R.B. (1993) *Planning and accomplishing school centred evaluation*, Peter Francis Publishers, Norfolk

Murphy, P.M, (1996) Pedagogy and Gender. in Wearmouth, J., *Developing inclusive curricula: equality and diversity in education*, Open University Press, Milton Keynes

Mulford, W., Watson, H.J., Vallee, J, (1980) *Structured experiences and group development*, Canberra curriculum development centre, Canberra

Murray – Harvey, R, (1994) Learning styles and approaches to learning: distinguishing between concepts and instruments, *British Journal of Educational Psychology*, 64, 373-388

Myrdal, G, (1969) *Objectivity in social research*, Pantheon, New York

NAAIDT, (2004) The National Association of Advisors and Inspectors in Design and Technology, Design and Technology and pupils with Special educational needs in ordinary schools, in, Davies *et al*, 2004, Approaches to teaching pupils with Behavioural, Emotional and Social Difficulties in Design and Technology, *DATA International Research Conference*

Newsome, G, (1963) *Half our Future*, Ministry of Education, HMSO

Ng, E. & Bereiter, C, (1991) Three Levels of Goal Orientation in *Journal of the Learning Sciences*, 1991, Vol. 1, No. 3&4, Pages 243-271

Nisbut, J, and Watt, J, (1984) Case Study, in, Bell, J, Bush, T, Fox, A, Goodey, J and Goulding, S, eds. *Conducting small scale investigations in educational management*, Harper Row, London

Norman, E. & Roberts, P, (1992) The nature of learning and progression in design and technology, in J Smith, ed, *IDATER*, 1992, Loughborough

O'Conner, B-2000-Using the design process to enable primary aged children with severe emotional and behavioural difficulties, (EBD) to communicate more effectively, in, *The Journal of Design and Technology Education*, 5, 3.

Office for Standards in Education, (2001) Secondary subject reports, 1999 /2000, Ofsted, London

Office for Standards in Education, (2002) Secondary subject reports, 2000 /1 Ofsted, London

Ofsted, (2005) 'A study of children and young people who present challenging behaviour', (Nov. 2003), *Ofsted*, London

Oppenheim, A.N, (1992) *Questionnaire design, interviewing and attitude measurement*, Pinter Publishers, London

Pask, G, (1988) Learning strategies, teaching strategies and conceptual or learning styles, in, Schmeck, R.R. ed. *Learning strategies and learning styles*, 83–100, Plenum Press, New York

Pearson. F, (1991) Structuring Design and Technology for pupils with learning difficulties, in, J. Smith ed. *IDATER*, 91, Loughborough University

Penfold, J.B, (1988) *CDT: Past, Present and Future*, Trentham, Stoke on Trent

Perry, W.G, (1968) *Forms of intellectual and ethical development in the college years*, Holt, Rinehart and Winston, New York

Petty, G, (1995) *Teaching today*, Stanley Thornes, London

Piaget, J, (1973) *The child's conception of the world*, translated by, J & A Tomlinson, Paludrin, London

Plowden Report, (1967) *Children and their primary schools*, Department for Education and Science, HMSO, London

Pollard, A. & Triggs, F, (1997) *Reflective teaching in secondary education* Cassell, London

Potts, P. & Armstrong, F, (1995) *Developing inclusive curricula: equality and diversity in education*, Hobbs, Southampton

Prein, G, Kelle, U, & Bird, K, (1995) An overview of software, in, U. Kelle, ed. *Computer aided qualitative data analysis*, Sage, London

Pring, R, (1984) Confidentiality and the right to know, reprinted in R. Murphy, & H. Torrence, eds. *Evaluating Education: issues and methods*, Chapman, London

Radnor, H, (2002) *Researching Your Professional Practice*, Open University Press, Buckingham

Resnick, L.-1991-Shared cognition: thinking as social practice, in Resnick, L. B., Levine, M., Teasley, S.D., eds, *Perspectives on socially shared cognition*. Washington, D.C. American Psychological Society

Richardson, E, (1973) *The teachers, the school and the task of management*. Heinemann, London

Rogers, C-1998-The interpersonal relationship in the facilitation of learning, in, Crawford, M., Edwards, R., & Kydd, L., eds, *Taking Issue*, Routledge, London

Rutter, M, Maughan, B, Mortimore, B, & Ouston, J, (1979) *Fifteen Thousand Hours*, Open Books Publishing, London

Scardamalia and Bereiter, -1999-Schools as knowledge-building organizations, in, D. P. Keating & C. Hertzman (Eds.) *Developmental health and the wealth of nations: Social, Biological, and Educational Dynamics*, 274-289, Guilford New York

Schofield, J.W, (1993) Increasing the generalisability of qualitative research, in, Hammersley, M., Ed., *Social research: philosophy policy and practice*, Sage, Publications, London

Shultz, A, (1954) Concept and theory formation in the social sciences, *Journal of Philosophy*, 51: 257 – 73

Singer, P, (1993) *How are we to live? Ethics in an age of self-interest*, Mandarin, Port Melbourne

Skilbeck, M, (1982) The school and curriculum decisions, in, Glatter, M, Preedy, M., Riches, C., Masterson, M., Eds., 1988, *Understanding School Management*, Open University Press, Milton Keynes.

Slote, M, (1995) Problems of moral philosophy, in, Honderich, T., *The Oxford companion to philosophy*, Oxford University Press, Oxford

Somekh, B, (1995) The contribution of action research to development in social endeavours: a position paper on action research methodology, *British Educational Research Journal*, 21, (3) 339-55

Sovic, N & Frostad, P, (1994) Can discrepancies between IQ and basic skills be explained by learning strategies? *British Journal of Educational Psychology*, 64, 389 – 405

Spradley, J.P, (1980) *Participant observation*, Holt, Rinehart & Winston, New York

Stables, K (1993) Who are the clients in school based design and technology projects? in, Smith, J.S. ed. IDATER, Loughborough

Stenhouse, L, (1975) *An introduction to curriculum research and development*, Heinemann, London

Toffler, A, (1970) *Future Shock*, Bodley Head, London

Torrence, H, (1989) Ethics and politics in the study of assessment, in *The ethics of educational research*, Falmer Press, Lewes

Taylor, W. Ed, (1973) *Research Perspectives in Education*, Routledge, Keegan and Paul, London

Thomas, M. and Denton, H. (2006) 'Exploring low ability and disaffected pupils' perceptions of the relevance of design and technology: a case study with a group of pupils aged between 14 and 16, Key Stage 4', E Norman (ed) *Design and Technology Education: and International Journal*, Trentham Books Ltd, Stoke on Trent, Volume 11.1, 145 – 58

Thomas, M and Denton, H. (2006a) 'Ethical Practitioner Research in Design and Technology Education: Developing a position and checklist for an action research project', E Norman, D Spendlove G Owen-Jackson (ed) *The D&T Association International Research Conference, 2006*

Thomas, M. and Denton, H. (2007) 'Factors contributing to low ability and disaffected pupils having a positive perception of the relevance of design and technology', E Norman (ed) *Design and Technology Education: and International Journal*, Trentham Books Ltd, Stoke on Trent, Volume 12.1, 47 – 54

Thomas, M. and Denton, H. (2007a) Action research: A review of the research methodology used in a practitioner action research project at a South Wales comprehensive school with particular reference to interview methodology, 20/06/07 [www.. net/](http://www..net/).

Trochim, W. M, *Likert summative scaling* (20/10/06 <http://www.socialresearchmethods.net/kb/> - accessed 12/11/06

Tuckman, B.W, (1972) *Conducting educational research*, Harcourt Brace Jovanovich, New York

Tufnell, R., Cave, J. & Neale, J, (1998) Employability skills – the contribution made by making activities, in, Smith, J. S. & Norman, E.W.L. eds. *IDATER*, 2000, Loughborough

Tufnell, R., Cave, J. & Neale, J, (1997) Teachers' beliefs about the value of making, in, Smith, J. S. ed. *IDATER*, 1997, Loughborough

Tyers, G, (1998) *Crafts council Learning Through Making Project*, Crafts council

Tyler, R, (1949) *Basic principles of curriculum and instruction*, University of Chicago Press, Chicago.

Vygotsky, L.S. (1962) *Thought and language*, MIT Press, Cambridge, Mass.

Wallace, B. and Crawford, S (1994) 'Instructional paradigms and the ADHD child', Weaver, C. Ed. *Success at last: helping students with ADHD achieve their potential*, Heinemann, Portsmouth.

Walker, R, (1978) The conduct of educational case studies: ethics, theory and procedures, in, Dockerell, B. & Hamilton, D. Eds. *Rethinking educational research*, Hodder and Stoughton, London

Walker, R, (1989) *Doing research: a handbook for teachers*, Routledge, London

Warnock, M, (1978) *Report of the committee of enquiry into the education of handicapped children and young people*, DfE, London

Watts, M. & Ebbutt, D, (1987) More than the sum of the parts: research methods in group interviewing, *British Educational Research Journal*, 13, (1) 25-34

Wearmouth, J, (1996) *Developing inclusive curricula: equality and diversity in education*, Open University Press, Milton Keynes

Weber, M, (1947) *The theory of social and economic organisations*, Oxford University Press, Oxford

Wellbourne-Wood, S, (1999) The routines and rituals of a design and technology classroom: an ethnographic study, in, Roberts, P. and Norman, E., eds. *IDATER 99*, 12- 19, Loughborough University

Winch, C. & Gingell, J, (1999) *Key concepts in the philosophy of education*, Routledge, London

White, P.A, (1973) Education, democracy and the public interest, in, Peters, R.S. ed. *The Philosophy of Education*, Oxford University Press, London

Whitehead, J, (1993) *The Growth of Educational Knowledge*, Hyde Publications, Bournemouth

Wilkinson, R, (1999) Key factors relating to good practice in the teaching and learning of key stage 3 design and technology, in Smith, J.S., and Norman, E. W. L. eds. *IDATER*, Loughborough

Wilson, N & McLean, S, (1994) *Questionnaire design: a practical introduction*, University of Ulster Press, Co.Antrim

Willis, P.E, (1977) *Learning to labour*, Saxon House, Farnborough

Woods, P, (1996) E835, *Educational research in action*, part 2, Open University, Milton Keynes

Wragg, E, (1984) Conducting and analysing interviews, in, *Conducting small-scale investigations in educational management*, Bell,J., Bush, T.,Fox, A., Goodey, J. & Goulding, S, Harper Row, London

Yin, R. K, (1984) *Case study research: design and methods*, Sage Publications, Beverly Hills

Zeichner, K. & Gore, J, (1990) Teacher socialisation, in, Housten, R. W. ed. *Handbook of research on teacher education*, MacMillan, New York

**Glossary of terms** – *this section defines educational terminology used in the thesis*

Bottom set – label given to the class with the lowest academic ability in a school year group

BERA - British Educational Research Association

BESDs – Label for pupils with Behavioural, Emotional and Social Difficulties

CAT – Cognitive Ability Test coordinated by the National Foundation for Educational Research, ([www.nfer.ac.uk](http://www.nfer.ac.uk)). This is a standard commonly applied test that gives a numerical indication of cognitive ability.

COEA – Certificate of Educational Achievement, now called Entry Level - Designed for students at key stage 4 and beyond who are unlikely to achieve a GCSE grade

CSE – Certificate of Secondary Education, phased out in the mid 1980s and replaced by the GCSE certificate. CSE examinations were aimed at lower ability pupils whilst O levels were aimed at the more able.

DATA – Design and Technology Association

DES - Department of Education and Science

DfES - Department for Education and Skills

ESTYN – Schools inspectorate for Wales

Entry Level - Designed for students at key stage 4 and beyond who are unlikely to achieve a GCSE grade. Formally called COEA – Certificate of Educational Achievement

Free school meals – the percentage of pupils entitled to free school meals is used as an indicator of social deprivation.

GCSE – General Certificate of Secondary Education, a system introduced in 1988 to assess pupils at 16 years old, in their final year of compulsory schooling. It replaced CSE and O level with a graded system from A\* to G, A\* to C correlates with the former O level qualification.

Ipsative - Type of assessment whereby the norm against which assessment is measured is based on prior performance of the person being assessed - the present performance is assessed against performance in the past. In this research the results of assessments are taken for each pupil across a range of subjects. This indicates in which subject the pupil has under or over achieved.

Key skills - Skills necessary to secure employment. These skills include basic skills such as literacy and numeracy, but may also include other generic skills.

Key Stage – A stage of the state education system in the UK setting the educational knowledge expected of students at various ages. The precise definition of each of the main 4 Key Stages is age-related, incorporating all pupils of a particular age at the beginning of each academic year. The stages referred to in this research pertain to: Key 3 Stage: Years 7 to 9 (11-14 years old) and Key Stage 4: Years 10 to 11 (14-16 years old).

National Curriculum - The National Curriculum is a framework used by all maintained schools in England, Wales and Northern Ireland to ensure that teaching and learning is balanced and consistent.

NFER - National Foundation for Educational Research, ([www.nfer.ac.uk](http://www.nfer.ac.uk)).

Ofsted - Office for Standards in Education, Schools inspectorate for England

QCA - Qualifications and Curriculum Authority

SAT – An end of Key Stage assessment

SEN – Special Educational Needs

SENCO – Special Educational Needs Coordinator

Sink Group – label given to a group that is low ability / disaffected / difficult to teach / behavioural problems

## Appendix 1.1

**Class Profile Chart** – *this section gives background details of one of the classes that took part in the research*

Class Profile ChartID	sex	age	SEN stage	Reading Age *	Attend	Days Ex	Sleuth refer	Sleuth Refer DT	CAT Score	GCSE Est
1001	m	14	4	8.02	95	3	6	0	70-2%	A/C1 A/G2
1002	m	15	3	9.06	95	3	6	0	85 16%	3 3
1003	f	15	2	9.09	30	0	0	0	74 6%	2 2
1004	f	14	2	9.10	55	1	6	0	81 11%	1 1
1005	m	15	na	12.02	95	2	12	0	82 12%	2 5
1006	m	15	na	10.02	95	0	1	0	70 2%	2 3
1007	m	15	3	8.04	90	1	16	1	70 2%	2 1
1008	f	14	5	8.00	95	0	0	0	74 6%	2 1
1009	m	14	4	10.02	95	0	2	0	70- 2%	1 2
1010	m	14	4	10.03	85	3	17	0	73 5%	2 1
1011	m	14	5	9.10	35	5	19	1	75 8%	0 3
1012	m	14	3	10.00	95	0	0	0	84 15%	2 3
1013	m	15	4	9.03	35	7	21	1	70- 2%	0 0
1014	m	14	3	9.11	85	1	2	0	74 6%	2 5
1015	m	14	na	9.07	90	1	5	0	72 4%	1 5

The class profile was based on quantitative data gathered from various sources: School records, Special Educational Needs register, NFER reading test, attendance records, Sleuth data, NFER-Nelson Cognitive Ability Tests. The snapshot was taken based on the time scale from September 2003 to April 2004. The data concerns only the year 10 group in 2003/04. However, the class profile is very typical of the same years' year 11 group and of groups that have gone through the system in the past.

ID	sex	age	SEN stage	Reading Age *	Attend	Days Ex	Sleuth refer	Sleuth Refer DT	CAT Score	GCSE Est
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ID – a numerical reference to the student, this attempts to address the issues of confidentiality and anonymity

Sex – male / female, to indicate gender balance

Age – chronological age of pupils rounded off to the nearest year. The figure was calculated at January 2004.

SEN Stage – the figures range from 1 to 5. 1 represents the first stage of referral, 5 means that the pupil has a statement.

Reading age – the reading age is based on the National Foundation for Educational Research, ([www.nfer.ac.uk](http://www.nfer.ac.uk)) test results taken the year before, when the pupil was in year 9. To illustrate the difference I have maintained the differential. The reading age is in the case of pupil 1 - 5 years and 10 months behind his chronological age.

Attendance – this is recorded in rounded up percentages

Days excluded – this records the number of days the pupil has been excluded since the start of year 7

Special needs – this records any particular special need the pupil might have. The information is based on the pupils' individual education plan.

Sleuth referral – this records the number of times a pupil has been referred to senior management using the sleuth referral system. This system collects information about serious pupil incidents from all staff across the whole school. The system is quite consistently applied and could provide a picture of how the pupils behave in different situations. Note that 1007 has 16 referrals, 1 of which was from design and technology, (truancy after afternoon registration), 1010 has 17 referrals, none of which occurred in design and technology lessons, 1011 has 19 referrals only 1 of which occurred in design and technology lessons, (Serious breach of health and safety). An example of the form is included in appendix www33ww.

CAT score – National Foundation for Educational Research, ([www.nfer.ac.uk](http://www.nfer.ac.uk)) Cognitive ability test. This is a standard commonly applied test that gives a numerical indication of cognitive ability. The top figure is the pupils' standardised score. Standardised scores in most educational tests cover the range from 70 to 140. 1001, for example fails to achieve the lowest score and has a standardised score of less than 70, (70-). The percentage figure underneath the standardised score is the pupils percentile ranking. How this pupil's performance compares with the rest of the pupils in the tests not just in this school but in all schools where the test has been applied. I have inverted the figures, 1001 result is in the lowest 2% of the test sample.

GCSE estimate – this is (a) the number of GCSE grades A\* to C that the school predicts the pupil will gain, and (b) the number of GCSE grades A\* to G that the school predicts the pupil will gain. Both figures together give the total number of GCSE that the pupil is to be entered for. 1001, for example is expected to get only 1 grade A-C, and 2 further GCSEs at A-G. 1001 is entered for a total of 3 GCSEs.

## **Appendix 1.2**

**Delphi group** – *this section gives background information regarding the members of the Delphi group*

The observations will be carried out during the natural course of the lesson. The 3 colleagues will be labelled T1, T2, T3. I will label any comments from myself as R. The observations will be written up initially as field notes recording incidents that the observers consider critical.

T1- works in the D&T department and teaches the group for 3 lessons out of 10 per fortnight. He will add a D&T perspective and be qualified to comment on subject issues that emerge. The workshops are all interconnected. Teaching staff share resources and have considerable freedom of movement. He will record observations of my lessons over a period of time. This will allow him to sample the observations over the hour-long period – the first 10 minutes, class activity, teacher support, the last 10 minutes. T1 will not be expected to stay, clipboard in hand, for the whole lesson. This, I am sure, would cause a reaction from the pupils.

T2 – is a full time support assistant who attends every lesson, 50 out of 50, in a fortnightly timetable. She will be able to draw on her whole school experience with the group. T2 is always with the group. She often makes notes to support her work with specific pupils. Carrying out her observations will be unobtrusive.

T3 – is a special needs teacher who is timetabled to support the group in some lessons, both in D&T and other lessons. T3 occasionally attends my lessons perhaps once a fortnight. His role is to monitor progress made by certain pupils within the group. The class are used to him attending lessons with them. His role too will be unobtrusive. The group is comfortable with him in attendance.

R – I will record critical incidents as the lesson progresses. These will be written up as quickly as possible after the end of the lesson.

The 3 staff have been briefed in the ethics of the research. The focus of their comments must be about my lessons. How I perform in the lesson, how the pupils interact with each other and me, how and what learning takes place. The aim is for these observations to build up a holistic picture of events during my lessons. It is possible that some parallels with other lessons will be drawn. If this situation arises the data will need careful consideration. The use of the Delphi Technique, as described above, may help to prevent this situation from occurring. The participants will be asked to record their observations independently at first. From these responses the researcher will develop a group view. The researcher will have the opportunity to filter comments that might pose an ethical threat to the research.

## **Appendix 1.3**

**Pilot interviews** - *The purpose of this section is to record and reflect on the findings of a series of pilot interviews.*

This section will contain:

- The aims of the pilot interviews
- Pilot interview 1 - Evaluating my interviewing technique with a group of similar pupils
- Background thinking
- Design of Pilot Interview 1 / Interview questions
- Tick list
- Pilot Interview 1 situation
- My own reflections on the pilot interview
- Discussion with Mr 18
- Reflections on Pilot interview 1
- Next Lesson – Pupil Feedback
- Pilot Interview 2 – to assess the effectiveness of the interview questions I intend to pose
- The research questions
- Pilot Interview 2 situation
- Reflections on Pilot interview 1
- Next Lesson – Pupil Feedback
- Concluding thoughts

### **Aim**

The aim of the pilot interviews is to:

- Evaluate my interviewing technique with a group of similar pupils
- To assess the effectiveness of the interview questions I intend to pose
- To assess the methods of recording that I propose to use

I decided to run two separate pilot interviews to address the above aims. The thinking behind this was:

- To gain experience and confidence in my interviewing technique and questions, and for me to reflect on their effectiveness
- To receive feed back from experienced colleagues regarding my interview technique and the interview questions
- To receive feed back from the pupils regarding my interview technique and the interview questions
- To receive feed back from my tutor regarding my interview technique and the interview questions

### **Pilot interview 1 - Evaluating my interviewing technique with a group of similar pupils.**

How do I evaluate my own technique? What criteria should I evaluate against?

Kvale, (1996, p.30), Woods, (1996,p91), The British Educational Research Association, (BERA, 1992), set of ethical guidelines, Loughborough University, (1999), ethical guidelines, and Radnor, (2002, p59 – 67) all advise on the characteristic features that should be evident in a qualitative research interview, -see methodology section 33.3

These could be combined to produce a useful framework to evaluate my interviewing skills against. (See page 4 of this section, 44.4)

How could I use this evaluative framework? I could tape record and evaluate my performance myself. I could use a colleague to evaluate my performance either through listening to the tape or by being present whilst the interview proceeded.

If a colleague were to observe the interview then I would run the risk of disturbing the natural setting by introducing another adult into the situation. This has to be balanced against my negative experiences of using a tape recorder.

The presence of another adult in a classroom situation is far more common now in a school setting than it used to be. Learning support assistants, line managers, NQT observers, HMI are all examples of the other adult. This, I believe, softens the impact of having another member of staff present to observe classroom interactions. There is also a greater opportunity to observe the complete interview. Significant interactions – gestures and silences could easily be lost listening to a recording.

I discuss my research with many of my colleagues and am grateful for their support. I selected a colleague who had experience of interviewing. He was the child protection officer for the school, a careers and guidance councillor and had been a pastoral head for many years. His role now includes monitoring Key Skills.

The class selected had to be one that would not be taking a direct part in the research. I did not want to sensitise them to the research and to add to the Hawthorn effect, (see Cohen, et al, 2002, p.127). For these reasons I selected a mixed ability group in Year 9. These would not be part of the group that I would be researching next year in year 10.

### **Background thinking.**

The group needed to evaluate a CD rack that they had designed and made. This gave me the opportunity to pilot my interview technique and to be evaluated by a colleague. The pupils were used to me asking them questions at the end of lessons and to use this time for group assessment. For example I might ask, “here is a product, what is made out of? What processes have been used? What are the advantages / disadvantages of the product? What features do you like about the product? Why?”

This type of questioning begins with lower order cognitive questions and builds towards more open-ended questions. Cohen et al, (1996, p.231) and McNair, et al, (2000, p.128 -133) discuss questioning techniques and suggest that the open ended / higher order questions involve “analysis, synthesis and evaluation”, Cohen et al, (1996, p.231). This process would mirror my interview procedure. The questioning begins by discussing the familiar – the made outcome, the product. This is intended to reassure the group that this is a non-threatening, familiar situation. Woods, (1996, p.83) describes researchers who adopt a qualitative approach as those who:

“Seek lived experiences in real situations. They try not to disturb the scene and to be unobtrusive in their methods in an attempt to ensure that data and analysis closely reflect what is happening.”

and that the topic of the questioning was-

“Life world – the topic of the interview is the lived world of the subjects and their relation to it.” Kvale, (1996, p.30)

However, a prime aim of my interviews is to “gain the perceptions” of a group of pupils. This would engage the pupils in discussing their feelings – their reactions to situations. By asking more open-ended questions it would be possible for me to gain richer data –

“Qualitative knowledge that would be expressed in normal language.”

and

“open nuanced descriptions of different aspects of the subjects’ worlds” Kvale, (1996, p.30)

It would be possible for an observer to make an assessment of the quality of interpersonal relationships-

“the knowledge obtained is produced through the interpersonal interaction in the interview.”

and whether or not the process was a positive experience –

“a well carried out interview can be a rare and enriching experience for the interviewee.” Kvale, (1996, p.30)

### **Design of Pilot Interview 1 / Interview questions.**

What materials / process / finishes have we used on these products?

Very closed questions

Which part of the making did you enjoy the most?

More open ended – opportunity to ask why questions / to probe

Which part of the making did you not enjoy?

More open ended – opportunity to ask why questions / to probe

Which CD rack is the best?

Open-ended – need to justify and reason, opportunity to manage a potential conflict situation.

Below is a tick list that Mr 18 would use to evaluate my interview technique against the criteria discussed above. This would help to identify features that were not present, features that were over used and features that needed further development. I also urged Mr 18 to record anything he felt significant that was not included on the tick list

Mr18 was asked if he would write up a draft transcript of the interview so that I could compare his record of events with that of my own. It would be difficult to complete the tick list and write transcript notes at the same time. I asked if he would mark the tick list as the interview progressed and then to write up his transcript of the interview as soon as possible afterwards.

The tick list is reproduced below:

## Tick list

Feature	Present
<b>Life world</b> – the topic of the interview is the lived world of the subjects and their relation to it.	
<b>Qualitative</b> – the interviewer seeks qualitative knowledge expressed in normal language.	
<b>Descriptive</b> – the interviewer attempts to obtain open nuanced descriptions of different aspects of the subjects' worlds	
<b>Sensitivity</b> – different interviewers can produce different statements on the same themes, depending on the sensitivity to and knowledge of the interview topic	
<b>Interpersonal relations</b> – the knowledge obtained is produced through the interpersonal interaction in the interview.	
<b>Positive experience</b> – a well carried out interview can be a rare and enriching experience for the interviewee	
<b>Active listening</b> – showing the other person that the interviewer is attentive.	
<b>Focussing</b> – keeping the interviewee on course.	
<b>Checking for accuracy</b> – pressing points, clarifying ambiguity.	
<b>Identifying clues</b> and indicators – developing the questions to ask next. Participants in a research study have the <b>right to be informed</b> about the aims, purposes and likely publications of findings....the potential consequences	
Care should be taken interviewing children <b>permission should be obtained</b>	
<b>Honesty and openness</b> should characterise the relationships	

## Pilot Interview 1-situation

23/6/03. – Convention – my questions in italics, responses underlined italics

1. In my workshop 10 minutes at the end of fourth lesson, before lunch.  
Weather is fine, class are seated on benches or stools around a bench
2. Mixed ability group, year 9, group of 15 pupils, 8 of which had completed their practical assignment – a CD rack. (There were 4 pupils absent out a class of 19). Mr. 18 sat on a stool at right angles to me but part of the group assembled round the bench. I felt that it was important for him to be part of the group rather than a detached observer. Being part of the group would give him an opportunity to observe any significant non verbal interactions.
3. I explained to the group that Mr.18 would join us for the last 10 minutes or so of the lesson. He was interested in what they had made, he wanted to know what they felt about the project and he wanted to find out how an evaluation in D&T worked out. I also explained that I was doing a project. The purpose of the project was to develop a better course in D&T. Mr. 18 would be taking some notes and would sit as part of the group. I assured them that anything they were to say would be confidential to the group that were present.
4. These factors would cover the BERA guidelines, 7 - 9 relating to participants. However, as discussed in the ethics section, covering points 10 / 11 would be more problematic.
5. To address the issue of confidentiality whilst still allowing me to be able to identify the person speaking called for the design of a code. Since these pupils are in year 9 I will use the prefix of 9, followed by their group number, 3, followed by their number on my register. The pupils in the main report will be identified by their register number only since they will all be in the same group. Staff will be identified by their staff number.  
*I have used italics for transcript sections as stated in the conventions section above.*

6. Interview questions.
7. What materials / process / finishes have we used on these products?
8. Very closed questions
9. I aimed this introduction at 934. She was confident and talked quite well. There were 3 basic designs for the CD racks, 2 based on MDF and a third based on a solid wood construction. This gave me the opportunity to aim the same question at 3 different pupils depending on their chosen design. Pupils 9312 and 939 were both less confident than 934 but both managed to identify the main materials used.
10. The purpose of this simple questioning was to reassure the pupils that this was not an intellectually demanding exercise and that everyone could make a valid contribution. It was an exercise in building up trust between myself and the participants. I repeated this with another 3 pupils. This time I asked them to identify the processes involved. This required a longer answer and also for me to encourage a more detailed response:
11. *Me - What about your rack, 9314? Can you describe how you cut the sides out and joined them together?*
12. *9314 – We drilled holes on the drilling machine and then you cut out the slots on the band saw.*
13. *Me – (to the same pupil) How did you mark the holes out?*
14. *9314 – We used a template to mark out the side and marked out where the holes needed to go in pencil.*
15. *Me – to 939 – and what about joining the sides together?*
16. *939 – We screwed the sides together onto a block.*

17. Me – to 939 – *How exactly did you do this?*

18. 939 – *We had to drill some holes in the sides first and then use a fat drill to make the hole a bit bigger so that the screw fitted in flat.*

19. The pupils appeared comfortable with the process so far. The next step was to ask more open ended questions which called for them to express opinions.

20. Me to 9311 -*Which part of the making did you enjoy the most?*

21. 9311 – *I don't know, I think I enjoyed making all of it.*

22. Me – *was there a part that you liked the most.*

23. 9311 – *(Silence)*

24. Me – *Remember now there is no one right answer. You all will have had different experiences of making your CD racks. I would expect different answers from lots of you.*

25. At this point I wanted to list a series of processes in the making that 9311 could have selected from. However, I resisted this temptation in this situation. I did not want the pupil to flounder in silence and so opened up the question to the rest of the group.

26. 934 - *I liked most of the making too like 9311 but I didn't like sawing the slots in the sides.*

27. This was to be my next question but I accepted the answer and attempted to develop the response.

28. Me to 934 – *Why? What didn't you like about sawing.*

29. 934 – It took ages, my hand stung by the end of it.

30. Me – Good!

31. Class – Chuckle

32. Me – No, I didn't mean good her hand was stinging, but good because it was an honest answer, and that's what I want. If you tell me the things that you don't like or can't understand then perhaps I can make changes so that the next group won't have to do these things.

33. 934 – OK to be honest with you sawing is pretty boring.

34. Me – Good that's another honest response. How many others of you feel that the sawing part is hard work and boring.

35. Class – general consensus agreement from the pupils who undertook this particular project. (This is interesting to me on a subject level – few had ever complained before. I could now offer more support to pupils to address this issue)

36. My next question was: Which CD rack is the best? This is a very open-ended question. The responses will need to be justified. It also gives me an opportunity to manage a potential conflict situation. I was also conscious of 934 having had a greater input than the rest. I offered this question to the class and sought a reply from a pupil who had not as yet participated in the discussion –938.

37. 938 had completed his project and his CD rack was one of the products being evaluated. His CD rack was, in my opinion, the best there but I knew that he would not say that himself. This introduced another dimension to the pilot interview. Pupils tend to be embarrassed about their achievements, especially in front of their peers.

38. I felt that similar situations could surface in the research interviews. The line of questioning would also lead to me asking more personal and focussed questions. Up to this point the questions had not been personalised. How would the pupil respond/ How would I manage the situation?

39. 938 – I think that 933s is the best.

40. Me – Why?

41. 938 – It will hold more CDs than mine.

42. Me – to class in general – Do you think that holding the most CDs is the most important thing when you judge a CD rack?

43. Class – no

44. Me – What do we use to list important things that our products need to do?

45. 933 – A design specification.

46. Me – Brilliant! Give me 4 things that your CD rack must do

47. 933 – look good, be strong, be well made -

48. Me – that's fine so 938 – look good, be well made – which one fits those 2 points?

49. 933 – silence

50. Others in the class – that's 933s his is easiest the best.

51. 933 – Yeah it's OK.

52. I finished the lesson off and dismissed the class

53. This was his verbal response but facially he was very pleased that his peers had made the decision for him.

54. This opens up a many sided discussion:

55. The pupil as expected chose the CD rack that was not his own. I thought his was the best. He did not mount a robust defence of his decision was this because he was embarrassed at being the best and wanted to deflect attention away from himself?

56. Was he tongue tied by the pressure of the situation? Did I allow the rest of the class to pressurise him into altering his decision? Had I interpreted his facial response accurately?

57. I had two methods to employ to attempt to establish which one or combination of factors would be the most accurate interpretation of the event - to seek the opinion of the observer and to privately ask the boy to explain his actions to me. I spoke to the boy later in the day and he confirmed that he was a bit embarrassed at having the best product.

58. My assumption had been correct. What if it had not been correct? Would I have used the rest of the class to manipulate the situation to gain confirmation of my assumption? What are the ethical and methodological implications of using the rest of the class in this way?

### **My own reflections on the pilot interview**

Immediately after the lesson was lunchtime and I was able to write up my transcript of the 10-minute interview. The main points are reproduced above, with the spoken words in italics. The next task was for me to evaluate my transcript against the tick list that I had designed.

<b>Feature</b>	<b>Present – see line</b>
<b>Life world</b> – the topic of the interview is the lived world of the subjects and their relation to it.	2, 8, 12, 14, 16, 18, 21, 23, 25, 29 all refer to the making of the CD rack, a lived experience
<b>Qualitative</b> – the interviewer seeks qualitative knowledge expressed in normal language.	21 to 33, 34 to 52 not quantitative
<b>Descriptive</b> – the interviewer attempts to obtain open nuanced descriptions of different aspects of the subjects' worlds	13, 15, 17 all descriptive. 22, 27, 40, descriptive but more about feelings
<b>Sensitivity</b> – different interviewers can produce different statements on the same themes, depending on the sensitivity to and knowledge of the interview topic	10, 11, my thinking in the interview regarding sensitivity, 21 – 28 reacting sensitively
<b>Interpersonal relations</b> – the knowledge obtained is produced through the interpersonal interaction in the interview.	29 – 33, use of empathy and humour,
<b>Positive experience</b> – a well carried out interview can be a rare and enriching experience for the interviewee	I could not establish this myself
<b>Active listening</b> – showing the other person that the interviewer is attentive.	I could not establish this myself
<b>Focussing</b> – keeping the interviewee on course.	29 – 33 this needed to be held together, potential for the interview to crash 16 - 19
<b>Checking for accuracy</b> – pressing points, clarifying ambiguity.	16 - 19
<b>Identifying clues</b> and indicators – developing the questions to ask next. Participants in a research study have the <b>right to be informed</b> about the aims, purposes and likely publications of findings....the potential consequences	21 – 32 reacting to the situation and moving on to the next question 3
Care should be taken interviewing children <b>permission should be obtained</b>	Meetings with – parents, Head, governors, and with pupils
<b>Honesty and openness</b> should characterise the relationships	3, 33, 35, 55 – 57.

I was very pleased with my own evaluation of my pilot interview. I felt that I had covered the majority of features that I had identified as to what makes a successful qualitative interview.

I needed to discuss my colleague's observations with him. Mr 18 had kindly allowed me to debrief him during the lunch hour which followed the lesson.

### **Discussion with Mr 18**

My transcript and his were very similar. We had both focussed in on the same passages of dialogue and had recorded them to convey the same meaning. There were small differences of word usage, for example, I had written:

*59. Me - What about your rack, 9314? Can you describe how you cut the sides out and joined them together?*

*60. 9314 – We drilled holes on the drilling machine and then you cut out the slots on the band saw.*

He had written – *“What about your rack, how did you cut the sides out and join them together?”*

*We drilled holes and then you cut the slots out for us.”*

We discussed the differences. He was unable to put names to people. I had taught the class all year, had the register to back up my memory, and written the transcript almost immediately.

Another difference was I had used technical language – drilling machine, band saw, he had not used these terms. He agreed that the pupils had used these terms but because he was,

“not immersed in the workshop situation he had subconsciously omitted them”  
(a quote from Mr 18)

There was also agreement on the recording of significant non verbal interactions during the interview:

61. *Me – that's fine so 938 – look good, be well made – which one fits those 2 points?*

62. 933 – silence

63. *Others in the class – that's 933s his is easiest the best.*

64. 933 – Yeah its OK.

65. I finished the lesson off and dismissed the class

66. This was his verbal response but facially he was very pleased that his peers had made the decision for him.

Mr 18 had also observed 938s facial response and had interpreted the reaction as I did

I was pleased that my ability to record the significant interactions in the interview had been endorsed.

I next discussed the checklist with Mr 18. Again there was general agreement. He had only recorded one example per box, whereas I had recorded all the examples after reading my transcript. The difference here was due to Mr 18 recording the ticks as the interview went on. As soon as he had collected one example to satisfy an identified feature he ignored any other examples in order that he could focus on gathering examples to satisfy other identified features. For example my checklist for Life World read thus:

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<b>Life world</b> – the topic of the interview	2, 8, 12, 14, 16, 18, 21, 23, 25, 29
is the lived world of the subjects and their relation to it.	all refer to the making of the CD rack, a lived experience

---

I had identified 10 references to the lived world of the interviewees from my transcript. Mr 18, carrying out the exercise live merely stated:

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**Life world** – the topic of the interview is the lived world of the subjects and their relation to it. Talked about their CD racks and how they made them (His underlining)

---

Mr 18 was however, able to make a comment on features that I could not establish myself:

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**Positive experience** – a well carried out interview can be a rare and enriching experience for the interviewee I could not establish this myself

**Active listening** – showing the other person that the interviewer is attentive. I could not establish this myself

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He felt that the “evaluation had been a positive experience for everyone who had taken part. Even the embarrassed pupil, in Mr 18’s opinion, had developed “a bit more confidence in his own ability due to the support offered by the rest of the group”.

We discussed the notion of “Active listening” and both agreed that this is an essential tool in a teacher’s armoury. Active listening in the sense that you are showing the other person that you are interested in what they have to say. Mr 18 felt that I had effectively displayed a “genuine interest in the pupil’s comments and their practical achievements.”

According to the criteria that I had agreed with Mr 18 prior to the interview I had executed a successful qualitative interview. However, I also urged Mr 18 to record anything he felt significant that was not included on the tick list. Mr 18’s other comments were also very supportive. He thought that the level of language used was appropriate and that there was a good balance of control and a sense of humour. I had included a good cross section of the class, both boys and girls and had also gained responses from the talkative and the reticent.

## **Reflections on Pilot interview 1**

After some reflexivity I began to doubt the effectiveness of my execution of the pilot interview. By creating a checklist before hand had I sensitised myself and my colleague to the point that my questioning was guided by the tick list? Had I orchestrated the interview to satisfy the criteria set out in the tick list? If that is so, would it be such a bad thing?

After reading and re-reading the pilot study another two problems emerged:

Ethically I should have not promised them total confidentiality, (line 3.6). This was not spotted at the time by me or Mr18. The content of this interview would be unlikely to produce anything that would be ethically contentious. However, it could be a major issue in the subsequent interviews where I invite responses that will be more based on their feelings and the factors that contribute to creating those feelings. I must ensure that this is rectified in the next pilot interview session.

The basis of the interview was the evaluation of tangible factors. I will need to gain responses regarding more emotive issues. The problem I envisage here is how to gain a response about “feelings” without describing the “feelings” in the question and in doing so produce a leading question. I will need to develop a strategy to address this problem in the next pilot interview session.

I did not want to impose on Mr 18s good will, he was not present for the follow up interview / meeting with this group on 30/6/03.

The aim of this pilot was for the pupils to verify my account. I used the transcript that is used above and explained first of all that I had changed all their names to numbers. The pupils reacted positively to this it gave them a sense of recognition and they could see what they had said written down in front of them.

The method of recording was accepted by the pupils. The verification progressed quite quickly until we got to lines 37. I should not have continued the process beyond this point because the boy was of a sensitive nature. The arguments over whose rack was best and why he became so embarrassed re-emerged. This account had already been verified between us. We had met later the same day and discussed his interpretations. Involving the pupils was meant to develop a sense of trust between myself and them. Raking up this embarrassing incident to discuss as a class was a mistake. I spoke to the boy privately at the end of the lesson and apologised but the damage had already been done.

This was an incident that I shall remember. I had been careless and over confident in my approach.

Pilot Interview 2 – to assess the effectiveness of the interview questions I intend to pose.

The aim of the interviews will be to gain the perceptions of a group of pupils located in Year 10, in the bottom set of a comprehensive school. The aim of this pilot interview session is to establish the effectiveness of the questions in terms of:

- The use of language
- The extent to which the children understand the questions
- The quality of their responses in terms of addressing the research questions.

### **The research questions and pick-ups**

- How do the pupils perceive themselves at school?
- Pick up: self esteem, confidence, ambition, reference to school pecking order

- What are the pupil's perceptions of technology lessons?
- Pick up: relationships, subject content, teaching styles, resources
- How would you describe a "good lesson"?
- Pick up: relationships, subject content, teaching styles, resources
- When did they become aware of their feelings about the relationship between themselves, the subjects they study and the school itself?
- Pick up: self esteem, confidence, ambition, reference to school pecking order

### **Pilot Interview 2 situation**

I asked a colleague to observe the interview and for him to comment on how far I had fulfilled the above aims of the pilot. Mr 14 has taught at the school for 27 years and has been a pastoral head for 7 years. Unlike the first pilot I did not provide a checklist. I discussed the aim of the interview with him and explained that this pilot was to assess the effectiveness of the questions. I had learned from the first pilot that to attempt to record what was being said and to complete the tick list was very demanding.

I selected a different mixed ability group in Year 9 to the group that I did pilot interview 1 with. These might react differently and would not be part of the group that I would be researching next year in year 10.

The lesson was lesson 4, before lunch. It was a warm sunny day and the class of 19 had 4 absent – quite a high percentage.

My first task is to translate the research questions into questions that these pupils can relate to.

- How do the pupils perceive themselves at school?

This, I feel needs an introduction, a prefix, and will be my first question:

1. *I am doing a project to make a better design and technology course for you. This is the first part of the project and I need to know your feelings about school.*
2. *I am going to ask you some questions today not about the lesson but about your selves. I want you to be honest with me and tell me about how you feel about yourself in this school.*
3. *Some of you might be happy to talk in this group situation, but others might want to come back and see me later on. What ever it is I am not going to run and tell. I think that you trust me enough to know that. I have to write a report about the project and I will make sure that all your names are anonymous – jumbled up – secret. You will know, though, from your PSE lessons no teacher can promise you a 100% secrecy. If you are in danger in any way it is a teachers job to pass on that information.*
4. I then warm the group up by introducing a game using thumbs –
5. *So let's start off by having some thumbs up, across or down.*
6. I demonstrate. The idea is to encourage participation and to home in on pupils who give a particular response. This could address the issue of leading questions. For example, if I were to ask the question “Hands up if you are not happy in school”. This could be interpreted by the pupils as a leading question. By using the thumbs up technique I could encourage a range of responses – If you love school / don't mind school / hate school. By recording where the thumbs are in relation to the question I could then home in to find out what factors contributed to these responses. I start with a warm up exercise:

7. *I'll ask you a question you will have 10 seconds to think about it and then I want you to show your thumbs, together at the same time.*
8. *OK lets have a trial run – The question is – Who likes curry, if you love curry put your thumb right up, if you don't mind it put it across if you hate curry - thumbs down. Do you all understand?*
9. Response - Some show their thumbs too early. This then influences the responses that the others give. However after a further two practices I ask the first question:  
  
*10. How happy are you at school? Very happy, thumbs up, not happy thumbs down.*
11. The plan then is to question a range of thumbed responses as to why they are happy or unhappy and what are the factors that contribute to these feelings  
  
*12. 9111 you are happy with school. Can you tell us about it? Is it just today you're happy? Are you happy most days?*
13. These are confidence building questions –yes / no answers, followed by:
14. Why are you happy in school? What makes you happy
15. These questions would provoke a more detailed response. Hopefully some of the responses will relate to the school, its organisation, lessons and pedagogy. A similar line of questioning would follow up the other thumbed responses. I anticipate a range of responses and so it is unlikely that a pupil is to be isolated as the only respondent. Having two or three pupils to gain a more detailed response from will ensure a spread of responses. The pupils will, I feel, gain support from each other and this too will promote discussion.

16. 9111 - Yeah, I'm happy today, Mr 12 isn't in and so I've got 2 free maths lessons today.

17. Me –So you're just happy today because you're going to have 2 frees?  
Or are you happy about school most days?

18. 9111 –I don't mind school, but it's really good if you haven't got maths. Mr 12 does my head (the pupil dislikes Mr12) in 'cause I'm no good at maths

19. The group agree with the pupil –Mr 12 hates him - says one - Mr 12 picks on him as soon as he gets into class - says another. I move onto another pupil:

20. Me - "What about you 9113, you showed that you weren't happy, can you tell me why?"

21. 9113 – I've seen my report (the end of year school report) and my mother is going to kill me when she gets it. She'll probably move me to another school so there's no point in me being here now.

22. Me – What's so bad about your report?

23. 9113 – Everything!

24. Me –There must be some good things?

25. 9113 – No not really, Art and D&T are not too bad. I did OK in those, I like the teachers and the teachers liked me so I've done a bit for those subjects, I'm going to take them next year. The other subjects are not good I made my mind up that I wasn't going to carry on with half of them anyway.

26. Me – So you don't mind D&T, Why is that? What is it about D&T that you like?
27. 9113 – I like the subject I like making things, doing things. Some lessons we only talk and write in like French. We never get to do anything in French apart from talking in French and writing in French.
28. The rest of the class laugh and agree with the pupil. As soon as we get into his room he starts to shout at us in French. We all know that he's saying stuff about us but we don't really know what.
29. This situation is quite difficult to manage. The group are now laughing and relating several stories about the teacher at the same time. The sense of order has been lost. I need to regain control. What will happen if I call for order? Up to this point the relationship between me and the pupils has warmed. 9113 is making useful responses. If I call the meeting to order – play the teacher- will I cause the flow of responses to dry up? I have no alternative but to call the meeting to order.
30. Me – OK that's enough of French what about D&T what are the things in the lesson that you like or don't like? Remember you are supposed to be helping me develop a better course. I'll need to know the good things about this course and the bad things.
31. 9113 said that she liked making things, doing things. Does any one else feel the same?
32. All the class appeared to agree.
33. Me – What about you 9117? You enjoy the practical bits of the lesson? Making things?

34. 9117 – Yeah – You can see what you're doing, you know what you are going to do in the lesson.

35. *Me – What do you mean – know what you are going to do in the lesson?*

36. 9117- Well the lesson usually starts with you telling us what we are going to do and then you leave us do it and help us when we get stuck.

37. The bell goes. I have run out of time and grossly underestimated what I would be able to do in one 10 minute session.

## **Reflections on Pilot interview 2**

Mr 14 agrees to give me another 10 minutes of his time and we reflect on the recent pilot. Using lesson 4, the lesson before lunch allows for an immediate debrief during the lunch period. However, I made it clear to Mr 14 that if any other points were to occur to him after reflecting on the interview he could return to me to add them to his original account. The following comments were made:

We agreed with each other's brief transcriptions of the previous ten minutes. The differences were very insignificant. There was complete consensus as to the main points that emerged. This complimented the findings in pilot interview 1 that I was able to accurately – according to the two observers and myself - record the main points under such conditions.

Mr 14 thought that the warning about confidentiality – lines 3.5/6, was overstated. I explained that it presented an ethical dilemma and that under the Children Act 1989 I could not promise confidentiality. He accepted this but still felt that in the context of these interviews it was unlikely that I would receive sensitive information that would pose a threat to the child. It would be far more likely in a one to one context and that the confidentiality warning could be kept until that type of situation arose. He felt that the warning put the pupils on their

guard, he sensed that some had “shut up the shop” and were too anxious to contribute. On reflection I had probably overstated the warning due to the mistake I made in the first pilot interview –to promise confidentiality. I feel that:

Some of you might be happy to talk in this group situation, but others might want to come back and see me later on. I have to write a report about the project and I will make sure that all your names are anonymous – jumbled up – secret. I think that we trust each other enough to know that I am not going to run and tell unless you come out with something earth shattering!

may sound less threatening than the original.

The thumbs game, (lines 5,6,7), however, did much to restore a more positive atmosphere. There was an element of fun and the pupils appeared to enjoy the exercise. Mr 14 thought that it was a good lead in to the first question as it allowed for a range of responses. It also enabled me to pick up on a range of responses and to follow them up. He felt that there was no sense of offering the group a leading question – Are any of you unhappy at school? Could provoke a unanimous response.

9111s responses (lines 16,18) opened up the issue of pupil teacher relationships. The class supported and added to the picture of the relationship that the boy portrayed. This would allow me a link into - What makes a good teacher / pupil relationship?

9113s responses (lines 20 – 25), were also potentially good data. The girl discussed teaching styles. However, it was inevitable that this discussion would develop into a comparison between one subject and another. This is an area that I would like to avoid for several reasons:

Attempting to research what happens in other lessons apart from technology, will be fraught with problems. I would need to gain access to observe and interview other staff from outside the department. This has time implications and ethical implications. What would their reaction be? Using other lessons as

a comparison would broaden the focus of the research, but this may well over stretch my ability to manage the research. I have discussed this issue in the introduction.

The discussion is steered away from the French lesson, (line 30), and again the responses, (31 – 36), display potential for me to gain useful information to address my research questions.

We were both surprised at how quickly the time had gone. I felt at the end of the ten minutes that I had barely started to get into the interview questions. However, it became apparent that several issues had been touched on. Many of the interactions had developed into useful responses. The children had moved toward addressing issues that I had identified as being significant. Issues of relationships, subject content, teaching styles, resources, self-esteem, confidence, ambition, reference to school pecking order.

Mr 14 and I both believed that the skill lay not so much in the question but in the management of the response. The questions are you happy / unhappy at school could have been developed by a pupil in a primary school. The management of the subsequent conversation, however, yielded potentially relevant data.

### **Next Lesson – Pupil Feedback**

This time I did not use the transcript that is used above. I summarised the information as follows and invited them to disagree if they felt that I had misrepresented anything:

1. Introduction – background -ethics / confidentiality
2. A game using thumbs – I demonstrate – trial run.
3. How happy are you at school? Very happy, thumbs up, not happy thumbs down.
4. 9111 you weren't happy with school, because Mr12 wasn't in and he "does your head in."

5. The rest of you agreed with what 9111 said.
6. 9113 – You weren't happy because of your report
7. You said that everything was bad about your report
8. Then you said that art and D&T were OK
  
9. 9113 interrupts – Yeah and music and Welsh are ok too
  
10. OK that's fine, I can change that
11. You said that you liked D&T because it was about making and doing.
  
12. Yeah – general consensus – not like French!
  
13. *I say - I don't want to go back to French again*
  
14. A lot of you said that you liked making and doing things
15. And that you the way the lesson runs – I tell you at the start and you carry on
16. I help you if you get stuck
  
17. Yeah or someone in the class helps us

Apart from the points mentioned above the group agreed with my version of events. I was pleased that there were some interruptions and that some of the pupils had the confidence to correct me. This is a feature that over a longer period of time would be developed. There may well have been some pupils who remembered the session differently but would not, due to the nature of the teacher / pupil relationship, correct me. However, some did correct me or added to the account. I was particularly pleased with line 17:

Yeah or someone in the class helps us

This response has the potential for another area of interest to be added to the list – team working / group working / peer mentoring. How the children relate to each other could be an area that could provide interesting data.

This example also illustrates the cyclical nature of the interview dialogue. The children in this example have fed an interesting idea into the process, an idea that I did not include as part of my original list of pick-ups. However, I feel that I have been receptive to a response that has potential to be explored. Each interview should build into and inform the next.

### **Concluding thoughts**

The aim of the pilot interviews was to:

- Evaluate my interviewing technique with a group of similar pupils.
- To assess the effectiveness of the interview questions I intend to pose.
- To assess the methods of recording that I propose to use

The experience of carrying out the pilot interviews has been very fruitful. It will inform and enrich my practice. The following points have emerged:

- According to the criteria that I had agreed with Mr 18 prior to the interview I had executed a successful qualitative interview.
- Mr 18 thought that the level of language used was appropriate and that there was a good balance of control and a sense of humour.
- I had included a good cross section of the class, both boys and girls and had also gained responses from the talkative and the reticent.
- Ethically I can never promise total confidentiality
- The pupils verified my account.
- The pupils reacted positively to this it gave them a sense of recognition and they could see what they had said written down in front of them.

- The method of recording was accepted by the pupils.
- Raking up potentially embarrassing incidents to discuss as a class is a mistake.
- The thumbs game created a positive atmosphere. There was an element of fun and the pupils appeared to enjoy the exercise.
- Mr 14 thought that it was a good lead in to the first question as it allowed for a range of responses.
- The game enabled me to pick up on a range of responses and to follow them up. There was no sense of offering the group a leading question.
- The discussions are managed effectively.
- The responses display the potential for me to gain useful information to address my research questions.
- Time will be a critical factor and will need to be dealt with flexibly. There may be occasions when the ten minutes will be insufficient and the discussion will need to be carried over into the next session.
- Many of the interactions had developed into useful responses.
- The children had moved toward addressing issues that I had identified as being significant. Issues of relationships, subject content, teaching styles, resources, self-esteem, confidence, ambition, reference to school pecking order.
- Mr 14 and I both believed that the skill lay not so much in the question but in the management of the response.
- Each interview should build into and inform the next.

The act of interviewing was probably made easier for me due to my position as a teacher of twenty years experience at this school. I have an existing understanding and empathy with the pupils. This would have to be constructed by an external researcher.

## **Appendix 1.4**

**Observational pro- forma** – *this section shows an example of the of the observation pro-forma as used in this research*

### **Please note:**

Context – the physical setting, time of day, weather conditions,

Timing – an indication of when, how far into the lesson

Persons – the people that are taking part, how many of them, their characteristics,

Activities – the aims of the lesson, in terms of teaching and learning,

Resources – what resources are deployed

Reactions – how the pupils are reacting to the activities identified above,

Feelings – what people feel and how this is expressed

A “relevant” connected to the present, situational; What the teacher is teaching is being clearly linked to the task in hand; What the pupils are learning is clearly linked to the task in hand

Record number of incidents, lesson and comment

B “relevant” preparation for a particular purpose; What is being taught is made explicit in terms of its usefulness in later life; A skill for life; Preparation for a job

Record number of incidents, lesson and comment

C “relevant” in a pastoral sense where a conflict might have been resolved by relating it to a real world situation

Record number of incidents, lesson and comment

## **Appendix 1.5**

**Pilot – recording observations of the use of “relevance” in teaching and learning** - *the purpose of this section is to record and reflect on the findings of a pilot observation implemented by a colleague with one of the target classes.*

This section will contain:

- The aims of the pilot observation
- Planning
- Background
- Context
- Comments on the pilot semi- structured interview
- Feedback
- Evaluation of pilot observation
- Analysis of the pilot observation
- Concluding thoughts

### **The aims of this pilot observation**

To establish:

- The effectiveness of the pro-forma in collecting data from the observation
- The effectiveness of the pro-forma in collecting data that could be analysed and cross referenced with data collected in the observations by the Delphi group
- The quality of the collected data in terms of addressing the research questions

To enable me:

- To gain confidence in the technique, and for me to reflect on its effectiveness
- To receive feed back from experienced colleagues regarding, pupils and my tutor on the effectiveness of the observation
- To evaluate timing – how long would the task take?

## **Planning**

A pro-forma was developed that would be effective, had a structure to allow for analysis and also allowed for other significant incidents to be recorded. The two understandings of “relevance” provided the main structured focus as well as the contextual information. The researcher produced an exemplar pro-forma that was circulated for comment by the Delphi group. The group concluded that they could not make meaningful comment on the semi-structured observation schedule until it had been used. The researcher piloted the schedule and discussed his perception of the pilot with the Delphi group. Through this discussion the additional category of “pastoral relevance” emerged.

## **Background**

Piloting the observational pro-forma would give first hand experience of any problems that may arise. The class selected was a mixed ability group in Year 10 who were studying Design and technology graphic products. The data will not be used as part of the research.

### **Pilot case study 1** observing my colleague teaching a graphics lesson

**Context** – Friday afternoon, last lesson, Year 10 mixed ability class of 21 pupils, 12 boys and 9 girls

Lesson – redesigning mobile phones – the development of a model stage.

Observations. The theme of the lesson, mobile phones, was very relevant to the popular culture that the pupils were engaged in. 16 out of the 21 pupils had mobile phones. The set of lessons had begun with a product analysis of the mobile phone and an evaluation of different mobile phones that the pupils owned themselves. This, in turn developed into a design specification for the “perfect” mobile phone with no technological constraints. The pupils had developed some designs and had also learnt the basics of orthographic

drawing. This lesson focussed on how the product could be further developed through three-dimensional modelling. By talking to the pupils and looking at their work it was possible to track how the teacher had engaged the class by his use of a relevant theme; relevant in the situational sense, relevant to the pupils at that particular time.

Teacher - What would be the next stage in the development of their designs if they were designers in the real world?

Class response – their designs would go from drawings to production.

Teacher – what would be the problems in going straight from paper ideas to products that would be sold in the shops?

Girl – there might be mistakes in them and people wouldn't buy them.....people wouldn't like them

Teacher – imagine if you were the owner of the company. What would happen to your company if people didn't buy your phones?

Class response – the company would lose money, go bust,

Teacher – in small groups have a chat and make up a list of ways the company would lose money, what costs would have to be paid out to make a product and so what would you lose money on if it wouldn't sell?

Group response – they would have a lot of phones that nobody wanted and they couldn't sell, they would lose money on materials that had been wasted.... Labour costs.....energy costs....(and eventually!) machinery costs.

Teacher – excellent so what do we need to do to make sure that this doesn't happen

Class response – make a model...prototype.

Teacher – some of you will be making models today. You will be using Styrofoam its what professional designers use sometimes to make models. You will need to watch and listen to what I am going to do for the next 4 minutes or so if you want to make a tidy model.

Teacher demonstration – blocks of Styrofoam, craft knife, glass paper, cutting board

Teacher – you need to watch this very closely. These knives are sharp; we've had a few nasty cuts over the years because people haven't watched closely enough. Use the knife like this and cut down always onto the mat. Use the glass paper to do any fine shaping and try to keep all the dust on the newspaper so that you can bin it at the end of the lesson

Class – are watching closely, engaged and are instructed to carry out this simple practical activity by working in pairs. Minutes into the practical activity there is a dispute between 2 boys over the use of a craft knife. There is some mutual “slagging” off. The teacher intervenes and stops the dispute as follows:

Teacher – just listen to you 2 “slagging” each other off. You are usually mates aren't you? Do you treat all your mates like this? To the class in general – What will happen if they carry on like this – friends one minute and not the next? What would happen if this pair were working in a factory and every 10 minutes they had to stop working to slag each other off? I'll tell you –first they would be chucked out of their jobs because they wouldn't be able to do their jobs properly and the other workers in the factory would get cheesed off with them arguing all the time and secondly, which I think is much worst than losing your job, you wont be able to make and keep good friends. You've got to learn how to get on with people!!!

The lesson continues

Towards the end of lesson

Teacher – Ok how many of you have made changes to your design because of the model?

Class – about half the class

Teacher – good, because that’s what usually happens in the real world. Like I said at the start of the lesson, you usually need to model an idea to get it off the paper and into your hand before you start making the real thing or even making thousands of them.

Homework is set and the lesson ends.

## **Analysis**

The transcript was then analysed to record incidents of reference to relevance.

The script was colour coded; (A) *“relevant” connected to the present, situational*; (B) *“relevant” preparation for a particular purpose*; and (C) *“relevant” in a pastoral sense*.

Teacher - What would be the next stage in the development of their designs if they were *designers in the real world*?

Class response – their designs would go from drawings to production.

Teacher – what would be the problems in going straight from paper ideas to products that would be sold in the shops?

Girl – there might be mistakes in them and people *wouldn’t buy them*.....people wouldn’t like them

Teacher – *imagine if you were the owner of the company. What would happen to your company if people didn’t buy your phones?*

Class response – the company would lose money, go bust,

Teacher – in small groups have a chat and make up a list of ways the company would lose money, what costs would have to be paid out to make a product and so what would you lose money on if it wouldn't sell?

Group response – they would have a lot of phones that nobody wanted and they couldn't sell, they would lose money on materials that had been wasted.... Labour costs.....energy costs....(and eventually!) machinery costs.

Teacher – excellent so what do we need to do to make sure that this doesn't happen

Class response – make a model...prototype.

Teacher – some of you will be making models today. You will be using Styrofoam its what professional designers use sometimes to make models. You will need to watch and listen to what I am going to do for the next 4 minutes or so if you want to make a tidy model.

Teacher demonstration – blocks of Styrofoam, craft knife, glass paper, cutting board

Teacher – you need to watch this very closely. These knives are sharp; we've had a few nasty cuts over the years because people haven't watched closely enough. Use the knife like this and cut down always onto the mat. Use the glass paper to do any fine shaping and try to keep all the dust on the newspaper so that you can bin it at the end of the lesson

Class – are watching closely, engaged and are instructed to carry out this simple practical activity by working in pairs. Minutes into the practical activity there is a dispute between 2 boys over the use of a craft knife. There is some mutual "slagging" off. The teacher intervenes and stops the dispute as follows:

Teacher – just listen to you 2 “slagging” each other off. You are usually mates aren’t you? Do you treat all your mates like this? To the class in general – What will happen if they carry on like this – friends one minute and not the next? What would happen if this pair were working in a factory and every 10 minutes they had to stop working to slag each other off? I’ll tell you –first they would be chucked out of their jobs because they wouldn’t be able to do their jobs properly and the other workers in the factory would get cheesed off with them arguing all the time and secondly, which I think is much worst than losing your job, you wont be able to make and keep good friends. You’ve got to learn how to get on with people!!!

The lesson continues

Towards the end of lesson

Teacher – Ok how many of you have made changes to your design because of the model?

Class – about half the class

Teacher – good, because that’s what usually happens in the real world. Like I said at the start of the lesson, you usually need to model an idea to get it off the paper and into your hand before you start making the real thing or even making thousands of them.

Homework is set and the lesson ends.

## **Appendix 1.6**

**Pilot - the semi-structured interview** - *The purpose of this section is to record and reflect on the findings after carrying out a pilot semi-structured interview.*

This section will contain:

- The aims of the pilot semi- structured interview
- Background
- Context
- Comments on the pilot semi- structured interview
- Feedback
- Evaluation of pilot semi-structured interview
- Analysis of the pilot semi structured interview
- Concluding thoughts

### **The aims of this pilot semi-structured interview**

To establish its effectiveness in terms of:

- The use of language
- The extent to which the children understand the questions / statements
- The quality of their responses in terms of addressing the research questions

To enable me:

- To gain experience and confidence in my technique, and for me to reflect on its effectiveness
- To receive feed back from experienced colleagues regarding, pupils and my tutor on the effectiveness of the semi-structured interview
- To evaluate timing – how long would the task take?

## Background

The actual task is to be administered by the SENCO. She is an experienced teacher, familiar with research methodology at Masters level and has good relationships with the pupils. The task will be carried out in the Learning Support Room, the room where these pupils have Mathematics and English lessons. This is a room where the pupils are familiar with the surroundings. Using my own workshop as the setting for the task could well influence the pupils' responses. Similarly, if the task were to be administered by me there would be considerable potential to skew answers. Setting the right atmosphere will be vital to gaining accurate data.

However, I felt that it was essential for me to have first hand experience of piloting the semi-structured interview. I carried out a "pilot" of the pilot before handing the task to the SENCO. Ethically I felt that it would be wrong to expose the SENCO and the pupils to an exercise that may not work effectively. The class selected had to be one that would not be taking a direct part in the research. I selected a low ability group in Year 10 who were studying design and technology graphic products, GCSE. This was a group that I did not teach. The class academic profile would be slightly higher than the targeted low ability group. Finding a group of pupils who were of a more similar academic ability, and, not involved with the actual research was not possible in a school of this size, (750 pupils, 11 to 18 years old). The data will not be used as part of the research.

I had identified an opportunity to carry out the pilot – a colleague had asked me to cover his class for half a lesson. He agreed to me using this time to pilot the test. It is acknowledged that the location of the test may influence the responses.

## **Context**

The class was made up of 12 boys and 8 girls; the lesson was just before lunch. I began by setting the scene as outlined below:

1. This is an exercise of what you feel; there are no correct answers and incorrect answers
2. The aim of the exercise is to find out what you think about the word relevant as individuals
3. The answers you give must be your own answers
4. I will explain the 6-point response to you and a fun pilot example will be tried out with you (see below)
5. I will read through each question and will explain each statement *by altering words with synonyms, (see examples in italics)*
6. I will check that you understand; *asking for verbal assurances and also by reading body language*
7. I will read through each question and explain the method of answering – 6-strongly agree, 4- agree – 3 –disagree, 1 –strongly disagree etc
8. On page 1 tick all the sentences that you think are correct, you don't have to tick them all
9. I will explain each group of tests to you as we go along

## **Comments on pilot semi-structured interview**

It became very apparent, almost immediately, that the group was unhappy about doing the task. The unhappiness manifested itself in several ways: some appeared totally puzzled by the first group of questions and could not make a response, there was some low level disruption, some appeared to be agonising over each question, one boy asked me what had they done to deserve this. He had perceived the test as some form of punishment!

I decided to stop the task after less than 10 minutes. As a practitioner researcher I was convinced that the task, as it was being administered at this stage, would not yield useful data. I drew a 6-point chart on the board and

asked the class if they had understood the scoring system. They agreed unanimously that they had understood. I then asked the class for a group response to question 1A:

<b>A</b>	The subject is useful to know about now, <i>at this moment, when you are doing the subject you think that it is useful as you are doing it, if you agree really strongly then tick box 6, if you agree tick box 4, if you disagree tick box 3 and really disagree tick box 1.</i>	6	5	4	3	2	1
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This provoked a useful debate within the class:

*“Yeah, Science - like when you work something out doing an experiment...finding out stuff on the internet...why World War One started”*

The class then showed hands for the various categories

<b>A</b>	The subject is useful to know about now, <i>at this moment, when you are doing the subject you think that it is useful as you are doing it, if you agree really strongly then tick box 6, if you agree tick box 4, if you disagree tick box 3 and really disagree tick box 1.</i>	6	5	4	3	2	1
		7	5	5	2	0	1

Conducting the entire semi-structured interview in this way would have its advantages. I would gain useful qualitative comments in addition to quantitative data. However, the exercise would be far too time consuming, and that the qualitative comments could influence pupils’ responses. The most effective compromise appeared to be for the pupils to carry out the task in groups of 2 or 3.

The group was asked to complete the task in this way. The responses need not be a consensus view; more than one category could be marked. The change in the attitude of the group was very evident. There was now a purposeful buzz. The groups were discussing the questions. I continued to read out the questions and to add explanations as the exercise continued.

Pupils discussed the questions, sometimes rather vigorously. They were reminded throughout that it was important to be honest about their responses, there were no “correct” answers, consensus answers were not required, they did not have to agree on which box to tick. I asked them to use a different colour pen or a particular symbol – a tick /cross / circle – so that individual responses could be tracked.

### **Evaluation of pilot semi-structured interview**

The task was completed in less than 20 minutes. Feedback from the pupils reported that they had eventually enjoyed the experience. I offered the group to return to me at any time if they thought of anything else that they wanted to tell me and had forgotten or been too embarrassed to discuss during this period. The exercise had provoked their thoughts. Debate amongst themselves into their responses continued after they had left the classroom.

Using the method described above, the group response, made analysis of the data less of a paper chasing exercise. The group of 20 recorded their responses on 9 semi-structured interview handouts as opposed to 20. The responses were then transferred to a master sheet and the group response to each question calculated. Each handout was referenced and the response colour coded. This would enable me to identify patterns that related back to the original question regarding the perception of the term relevant if this were deemed necessary at some future stage in the research. Individual responses could be analysed within each semi-structured interview. This exercise was carried out and is included later in this section. At this stage, however, only a group response was required.

The aim of this pilot semi- structured interview section is to establish its effectiveness in terms of:

- The use of language – the children understood the language used in the statements. The use of language was simple and clear.

- The amplification of statements using a verbal voiceover ensured clarity. There were opportunities to clarify any uncertainty
- The extent to which the children understand the questions / statements – the children appeared to understand the statements and the method used to implement the semi structured interview. The rating scales were easily followed. There were opportunities to clarify and uncertainty. The pupils felt part of the process rather than as a group that were being tested. There were no correct or incorrect answers.
- The quality of their responses in terms of addressing the research questions – the responses appeared to yield useable data. My interpretation was cross referenced by checking with a colleague for his interpretation and by interviewing the pupil
- To gain experience and confidence in my technique, and for me to reflect on its effectiveness, To receive feed back from experienced colleagues regarding, pupils and my tutor on the effectiveness of the questionnaire, To evaluate timing – how long would the task take? Each of these points have also been addressed

A key factor in the success of the pilot semi structured interview was reacting to the pupils' initial negativity towards the task. Ball, (1990:157-171) comments that to establish a rapport with the participants is critical. Bird *et al*, (1996:90), emphasises developing skills of reflection, observation, listening and recording. I would add “reacting” as another essential skill. A critical awareness of what is happening and the confidence to make amendments to the original plan.

### **Detailed analysis of the pilot data**

Using the colour coded responses and the different colour pens it was possible to identify individual pupils. I decided to track the response of one individual as one means of evaluating the usefulness of the semi-structured interview schedule. The individual was selected because of the polarity of his views.

This could then be related back to responses made in the first section, for example:

		6	5	4	3	2	1
<b>A</b>	The subject is useful to know about now			1			
<b>B</b>	The subject is interesting	1					
<b>C</b>	You can see what you are doing	1					
<b>D</b>	You understand what you are doing	1					
<b>E</b>	You like the subject	1					
<b>F</b>	The subject is useful to help me in a job I might get when I leave school			1			
<b>G</b>	The time goes quickly		1				
<b>H</b>	You learn a lot		1				
<b>I</b>	You like the teacher		1				
<b>J</b>	The subject could be useful to me at some time in the future				1		

Using the strengths of the responses it could be argued that **1** favours an interpretation based on 2 of the 4 meanings; Relevant because it was enjoyable, relationships were positive, experiences in the lesson were positive. *Relevant because it was tangible, you could see what you were achieving and could understand why you were being asked to do something.* Knowing about the subject for its own sake or for any form of deferred gratification was only agreed or slightly disagreed with as opposed to the stronger responses made in the other categories.

These responses could then be discussed in the context of the other tasks. Using only English and design and technology as examples the following patterns emerged.

Which subjects do you think are relevant to you?

	<b>Task 2</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>A</b>	English						<b>1</b>
<b>E</b>	Design and technology	<b>1</b>					

It can be argued then that this respondent does not see English as being relevant because perhaps he finds English boring, does not understand the subject, doesn't like the subject, the time goes slowly, he doesn't learn much in the lesson and does not like the teacher. He does not rate relevance as being associated so strongly with the other 2 interpretations; *Relevant in terms of future employment Relevant to what was happening at the time, understanding the aims and context of the lesson*, and, therefore does not perceive English as being a relevant subject.

Design and Technology, however, was perceived as being extremely relevant. Based on the responses to task the converse could be argued.

In task 3 respondent 1, gives the following response:

Which subject do you think will be of use to you in the future?

	<b>Task 3</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>A</b>	English		<b>1</b>				
<b>E</b>	Design and technology	<b>1</b>					

Here he strongly agrees that English will be of use to him in the future. This illustrates that this respondent does not connect relevance with use in the

future. There is a very strong agreement that Design and Technology will be of use in the future. The boy may well have career aspirations as a craft worker of some kind. Tracking the same respondent to task 4:

Which school subjects do you find useful now as you are doing them?

	<b>Task 4</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>A</b>	English					1	
<b>E</b>	Design and technology	1					

He finds English of very little use to him as he does the subject. This correlates with his original responses to task 1 and his tendency towards 2 out of the 4 interpretations of relevant; *Relevant because it was enjoyable, relationships were positive, experiences in the lesson were positive. Relevant because it was tangible, you could see what you were achieving and could understand why you were being asked to do something.* Design and technology again scores highly, this correlates with the respondents perception of relevance as being - *because it was tangible, you could see what you were achieving and could understand why you were being asked to do something*

His responses to tasks 5 and 6 are perhaps predictable:

In which school subjects do you understand what you are doing / can see what you are doing?

	<b>Task 5</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>A</b>	English						1
<b>E</b>	Design and technology	1					

The English response lies in the lowest category. The boy does not understand what is happening in the English lesson. In design and technology he can see what he is doing, his work is more tangible.

Which school subjects do you enjoy?

	<b>Task 6</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>A</b>	English						<b>1</b>
<b>E</b>	Design and technology	<b>1</b>					

The inferences drawn so far have been based on my interpretation of the data. I decided to check my inferences by giving the data on this particular pupil to a colleague and to interview the boy to clarify his responses, and my interpretation of his responses.

The colleague agreed with my interpretations. The boy's responses were quite polarised. His perception of relevance appeared to reflect his perceptions of subject qualities. **1** favours an interpretation based on 2 of the 4 meanings; Relevant because it was enjoyable, relationships were positive, experiences in the lesson were positive. *Relevant because it was tangible, you could see what you were achieving and could understand why you were being asked to do something.* Knowing about the subject for its own sake or for any form of deferred gratification was only agreed or slightly disagreed with as opposed to the stronger responses made in the other categories.

The boy was interviewed. There were relationship problems between himself and the English teacher. He struggled with the subject and wanted to go down into a lower ability set. English was going to be an important subject for him in the future, to get a job but he did not see at relevant to him at the present time. Design and technology, however, was a subject he enjoyed –*“I look forward to the lessons.. I get my best marks in Design and Technology”*. He had plans to follow a career in graphic design.

Four broad interpretations of the term relevant have been identified:

1. Relevant in terms of future employment
2. Relevant to what was happening at the time
3. Relevant because it was enjoyable
4. Relevant because it was tangible

His perception of the term relevant was limited to the present and to 3 of the 4 interpretations. He did not link the interpretation - *Relevant in terms of future employment*- as significantly as the other interpretations. He perceived design and technology as being relevant in all interpretations of the term; in terms of future employment, understanding what was taking place in the lesson, because it was enjoyable, and because it was tangible. Whilst he perceived English as being relevant to future employment he could not perceive the subject as being relevant in terms of the other 3 interpretations.

## Appendix 1.7

**Observation proforma** - *this section shows examples of completed observation proforma and reflects on their effectiveness.*

Observation schedule Attendance –15/19 in total, 3 girls 12 boys

Date: Wednesday Time: last lesson, 1.55 -2.55pm. Weather – fine and dry

Class: 10D ( bottom set) Subject - Design and Technology -Teacher: Me

Context –Timing –Activities –Resources –Reactions –Critical events –Feelings

<ol style="list-style-type: none"> <li>1. Context.</li> <li>1. This lesson occurs after lunch at the end of a (2+2+1), 5hr day.</li> <li>2. Lunchtimes are always problematic as there is little shelter for the pupils in inclement weather. Today was dry.</li> <li>3. <b>The brief minutes before lesson starts.</b></li> <li>4. I register a class in another part of the school, some of the class are outside my room before I arrive back from registration.</li> <li>5. Today will be a practical lesson, they are finishing off a course work project – Clock. The project has gone well and the class has produced pleasing outcomes.</li> </ol>	<p><b>Total lesson time – 60 mins.</b></p>
<ol style="list-style-type: none"> <li>6. <b>As the pupils arrive at the classroom.</b></li> <li>7. It is school policy to line up all classes outside the classroom, and to remove coats and baseball caps.</li> <li>8. <i>I never stick to this rule with classes like this, it has not been a conscious decision, Why??</i></li> <li>9. The class came from 4 registration classes so inevitably the pupils did not arrive as a class, some pupils took longer than others.</li> <li>10. As they arrive in the room most of them remove top coats and hats.</li> <li>11. I take the register, it is not silent, but I can hear every response, the procedure is carried out quickly, accurately and without any confrontation.</li> <li>12. <b>The start of the lesson.</b></li> <li>13. The class are eager to start the lesson, some have already started to get their work from the cupboard, this has pre-empted my instructions to do so but – <i>have I got to be in charge all the time!?</i></li> <li>14. I'm just pleased that they want to get on with things</li> </ol>	<p>Time into lesson</p> <p>3.mins</p>



<p>34. <i>I feel that he has probably responded more positively to his friend's comments than he would have to mine.</i></p> <p>35. I call the class to order, pupils are engaged in various tasks – using the sander is particularly noisy, they take a minute or so to come to order.</p> <p>36. <i>I could have tried to insist that they respond more immediately, I feel that this would have led to confrontation, and would have taken up time and would have soured a good working atmosphere.</i></p> <p>37. <i>I have got my own way, it has not been instant but it has not been confrontational –</i></p> <p>38. <i>I feel secure enough in my professional practice to meet these young adults half way.</i></p> <p>39. The response from the class is good – they listen quietly</p> <p>40. I talk for 3 to 4 minutes only, using simple language and bullet points.</p> <p>41. They carry on their various activities.</p> <p>42. There is about 15 minutes of the lesson left, one boy starts to pack up.</p> <p>43. I ask him why, he says that everything has gone wrong in this lesson for him, he wants to jack it in and have a fresh start next lesson.</p> <p>44. <i>I empathise, I feel like that some days.</i></p> <p>45. <i>I feel that it would be better to allow the boy to pack away than to flog a dead horse.</i></p> <p>46. The boy usually works quite well. I see no point in forcing him to continue today.</p> <p>47. <i>What would the boy gain from me compelling him to continue?</i></p>	30.mins
<p>48. <i>What would my insistence do for our relationship?</i></p> <p>49. <i>I feel that I have made a decision based on my professional judgement.</i></p> <p>50. 10 minutes to go and more pupils start to pack away.</p> <p>51. Normal pack away starts a few minutes after this, but I have made an allowance for one pupil and others now inevitably follow suite.</p> <p>52. Telling them all to carry on would cause a confrontation.</p> <p>53. It would be unfair – “I let him pack up, why not us?”</p> <p>54. I decide that everyone should pack away.</p> <p>55. This is a good opportunity to observe workers – pupils who busy themselves tidying, and shirkers – those who go for their coats and bags.</p> <p>56. I draw everyone's attention to this divide and it has the desired effect.</p> <p>57. The workers tell the shirkers to get their coats off and help.</p> <p>58. “This is your mess, these are your tools, you put them away yourself”</p> <p>59. 3 minutes before the bell, the room is tidy.</p> <p>60. I try to re-cap on a few points from the lesson but they are itching to go.</p>	45.mins

<p>61. I notice a boy and a girl standing intimately close and I rise an eyebrow.</p> <p>62. The class giggles and another girl tells me that her friend – the girl has been going out with the boy for 2 weeks”</p> <p>63. I use this “relationship” comment to add instant relevance to the lesson</p> <p>64. “You could have a place of your own in a couple of years, you’ll need to be able to measure things and do things for yourselves, you’ll need skills – be able to read and fill in forms, “ and so on.</p> <p>65. The class agree.</p> <p>66. I talk about timescale and planning another year and they could finish school, “a year is about 20 weeks for you lot with holidays”</p> <p>67. I ask what plans they have for themselves.</p> <p>68. The consensus is very low self esteem – unemployment is high and is second or third generation in many cases</p> <p>69. I remind them of what they have achieved in this lesson.</p> <p>70. I emphasis the positive and show them the AS job.</p> <p>71. The bell goes I say OK and they all leave and go for the bus.</p>	<p>50.mins</p>
	<p>55.mins</p>

## A record of the learning support assistant's pilot observation

Observation schedule Attendance –15/19 in total, 3 girls 12 boys

Date: Wednesday Time: last lesson, 1.55 -2.55pm. Weather – fine and dry

Class: 10D (bottom set) Subject - Design and Technology Teacher: Me

Context –Timing –Activities –Resources –Reactions –Critical events –Feelings

<ol style="list-style-type: none"> <li>1. Context.</li> <li>2. This lesson occurs after lunch at the end of a (2+2+1), 5hr day.</li> <li>3. Today was dry.</li> <li><b>4. The brief minutes before lesson starts.</b></li> <li>5. Teacher a bit late for arrival of class</li> <li>6. Pupils arrive in groups at different times</li> </ol>	<p><b>Total lesson time – 60 mins.</b></p>
<ol style="list-style-type: none"> <li><b>7. As the pupils arrive at the classroom.</b></li> <li>8. Teacher does not insist on the pupils lining up as they do in lots of lessons</li> <li>9. As they arrive in the room they remove topcoats and hats without being reminded.</li> <li>10. Register is taken.</li> <li><b>11. The start of the lesson.</b></li> <li>12. Pupils begin to get tools and work out of cupboards</li> <li>13. Good atmosphere</li> <li>14. Teacher speaks to the whole class for a couple of minutes</li> <li>15. Teacher uses someone's work as an example</li> <li>16. The class are generally attentive.</li> <li>17. A boy starts to mess about – just silly poking – 2 of the class tell him to wise up, and he stops</li> <li>18. Teamwork is emphasised –there's not enough equipment for everyone to do the same thing at the same time. Sharing and taking pride in your work.</li> <li>19. Good atmosphere – no confrontation</li> <li><b>20. The activity begins.</b></li> <li>21. Pupils get on with various tasks. There is a sense of purpose and I can observe pupils helping each other</li> </ol>	<p style="text-align: center;">Time into lesson</p> <p style="text-align: center;">3.mins</p> <p style="text-align: center;">10.mins</p>

		15.mins
<p>22. There is a dispute over a sanding machine – 2 pupils want to use it at the same time</p> <p>23. The teacher points out that they cannot physically use it together, they must come to some kind of compromise, someone’s got to take a step back.</p> <p>24. One of the girls joins in and tells the boys to grow up</p> <p>25. The dispute is quickly resolved</p> <p>26. The class is called to order it is particularly noisy, they take a minute or so to come to order.</p> <p>27. The response from the class is good – they listen quietly</p> <p>28. Teacher talks for 3 to 4 minutes only</p> <p>29. Teacher emphasises a professional finish – would you buy this if you saw it in a shop? How much would you pay for this in a shop?</p> <p>30. The various activities continue</p> <p>31. Good examples of pupils working together and helping each other</p> <p>32. A boy is a bit of an expert on the band saw and he is using it a lot to help other pupils who are not so good / keen to use the machine</p> <p>33. Good atmosphere – no confrontation</p>	<p>20mins</p> <p>30.mins</p> <p>45.mins</p> <p>50.mins</p> <p>55.mins</p>	<p>end</p>

## **Reflections on the Pilot Observation**

There were considerable similarities in both records of the observations. The main difference was that I had recorded the observation in more detail. However, I felt that the learning support assistant had recorded sufficient information that could be used as the basis of a follow up interview. There would be a need to clarify the raw information recorded and an opportunity to deepen understanding. Denzin, (1997:300), develops the notion of methodological triangulation by identifying two categories. "Triangulation within methods" concerns the replication of a study as a check on reliability. "Triangulation between methods" involves the use of more than one method in the pursuit of a given objective. One of the commonest forms is to combine interviews with observation. (See, Woods, 1979, and Lacey, 1976).

After some reflexivity some doubts emerged. By creating a checklist before hand had I sensitised my colleague and myself? Had I orchestrated the observation to satisfy the criteria set out in the tick list? To address these issues I asked the pupils to verify the accounts. I used the transcripts that are used above. The pupils reacted positively. It gave them a sense of acknowledgment and they could recognise the account of the lesson. The pupils accepted the method of recording.

## **Conclusions**

The observation technique of both the learning support assistant and myself appeared to be adequate to the task. However, it would be essential to clarify the raw information recorded. This would also offer an opportunity to deepen understanding. Observers would be interviewed after any observations.

## Appendix 2.1

**Transcripts of observations** – *this section contains transcripts of the initial observations carried out by the Delphi group*

	<b>Observations T1</b>
Relationships	Year 11B are a challenging class to teach. They are that sort of class! R takes the class for 7 lessons a fortnight; I take them for the other 3. My observations are based on working together for the last 20 years. They are comments on aspects of the teaching that I feel are significant.
Enthusiasm	Relationships are very good between R and these pupils. He is consistent, there is an informal feel to the lessons and confrontation is rare. With this type of group that is surprising. Enthusiasm is a key factor in getting on with this group of pupils. I believe that they react positively when they are made to feel that there is someone taking an interest in them.
Take ownership Relevance	The year 11 group follow the GCSE resistant materials course and has more time to get through the course than the main stream group. The project starts in Easter year 10. The choice of project is very important, the pupils need to take ownership for it. The pupils are encouraged to pick their own project. At Easter time the present year 11 projects are completed. There are three-dimensional, made, real products and the completed design folders to go with the jobs. The pupils can see exactly what is required.
Exemplar work	Using the year 11 completed work helps the pupils in project selection, to set standards for themselves and to understand better the concept of long term planning. Planning of any kind is difficult with this type of group. Doing the project design folders are always a contentious issue with the group. The use of the exemplar material from previous years helps them understand the relevance of the work – if I am going to make this I will need to find out .....
Exemplar work Relevance	.....how big?, how much? how strong? These problems are then broken down into tasks.
Timing	At the start of the project it is possible to class teach – to look at these problems as a class. This is about as close as we come to being classroom teachers. There is a definite policy with this type of group to have a sharp pace to the lesson. Talk for a few minutes or so and then a 10 minute activity. I think R is realistic. The work is always kept in school and he never gives this group home work

Gender issues	<p><b>Observations T2</b></p> <p>This group as a whole has matured and is getting on as a class much better. <b>The girls as usual are</b> no problem all working hard and attendance is good.</p>
Attendance	<p>Some of the <b>attendance</b> of the boys was not good beginning of the term but improved once they started on their projects. 1112 and 1105 have improved very well this year, they are hard working and very helpful in class.</p>
Making	<p><b>This group is overall much better when making then actual folder work, saying that though I have found that they work better on their folders in this lesson, then says their English work. I feel this is because they are doing something they really like and can see something at the end of it.</b></p>
Tangibility Relevance	<p>A bench or coffee table looks better to them then a slip of paper with exam results printed on it.</p>
Behaviour	<p><b>The group can still argue amongst each other but I find this is a bigger problem in other lessons rather than in D&amp;T.</b> The only ones who are poor at turning up to class are 1109 1106, 1109 is the only one who can still be a little argumentative. I think this group have taken on board the good teaching they get in D&amp;T and the fact that <b>this department as a whole treat them as the adults they are becoming and there is I feel a great deal of respect</b></p>
Relationships	<p>between both parties due to this fact.</p>
Group composition	<p>Year 11 are now a much nicer class, they have benefited a lot from taking D&amp;T, the <b>fair treatment</b> and excellent teaching they get throughout the department has helped them to mature and become hard working pupils. When they were in Year 10 however it was a different story, they were very immature, their attitude stank and by <b>being a slightly mixed group</b> some people thinking that they were better then others didn't help.</p>

<p>Key skills</p> <p>Group work</p> <p>Relationships</p> <p>Relationships</p> <p>Confidence</p> <p>Relationships</p> <p>Social skills/ behaviour</p>	<p><b>Observations T3</b></p> <p>During the lessons the children have learnt a range of practical skills, designing their projects, discussing the complexity of the plans, learning names of a range of tools and how to use them safely, being introduced to different types of materials and their purposes and making the designs. The activities have <b>used a range of skills including number, measuring and problem solving.</b></p> <p>In addition to the practical skills the children learnt additional skills that were gained during the lessons, observing the pupils they <b>worked together both in small groups and as pairs.</b> The children <b>helped each other with tasks and would see others who were struggling and go and help them without being encouraged to do so.</b> Which for children with their range of needs has been not only encouraging to see happen but they have also be observed using shared learning and teaching in other classrooms.</p> <p>The children, during the activities, have developed a <b>mature attitude when working in pairs and sharing out tasks. Skills such as turn taking, sharing work and equipment and understanding that they have different abilities</b> have also begun to develop further.</p> <p>There have been some significant personal gains for individual pupils taking part in these lessons <b>including increased confidence, sharing and developing mature approaches not only to the work but also to each other.</b> It has given them the confidence to focus on developing skills to over come personal difficulties and to also <b>recognise acceptable behaviour.</b></p>
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Informality	<p><b>Observations R</b></p> <p>Today will be a practical lesson, they are finishing off GCSE course work projects. The projects have gone well and the class has produced pleasing outcomes.</p> <p>I take the register, it is not silent, but I can hear every response, the procedure is carried out quickly, <b>accurately and without any confrontation.</b></p>
Timing	<p>The class are eager to start the lesson, some have already started to get their work from the cupboard, this has pre-empted my instructions to do so. I'm just pleased that they want to get on with things I call the class to order and tell</p>
Exemplar material	<p>them that I am going to <b>speak for 5 minutes</b> and then the lesson is theirs, they need to listen carefully. I deliver the aims of the lesson to them I use some ones work as <b>exemplar material</b> – most of the class can see exactly what is required to complete their project The class are generally attentive. A boy starts to mess about – just silly poking – 2 of the class tell him to wise up, and he stops I <b>emphasis teamwork</b> –there's not enough equipment for everyone to do the same thing at the same time. I talk about sharing, about taking pride in your work.</p>
Group work	
Timing	
Praise / relationships	<p><b>I never let the tasks go on for too long. After about 15 minutes I call a halt and we discuss progress</b>, evaluate how things are going, asking the pupils their opinions. I emphasise not to rush; not to be the first.</p>
Exemplar material	<p>Five minutes later I stop the lesson and <b>give some praise</b> to a pupil who has listened and is doing well. He's embarrassed, but I also think that he is quite pleased. He's polishing an edge of an acrylic clock with fine wet and dry. It's time-consuming work but he is achieving a good finish. His will be a good job – a <b>GCSE grade C/B and</b> I tell the class this.</p> <p>At the end of the lesson I ask the class to plan – think what they are going to do next. If they do not plan they could be stuck next lesson. Most pupils write a short note in their folders for next lesson.</p>

## Appendix 2.2

**Follow up interviews with staff** – *this section contains transcripts of the follow up interviews, in each case the researcher's questions / comments are in italics. Interviews were used to clarify issues identified in the observations carried out by the Delphi group.*

Interview with T1

*“Year 11B are a challenging class to teach. They are that sort of class!” What did you mean by that?*

You should know, their reputation has gone before them, having said that they are no worse than the other bottom set groups that we have. I know that they are climbing the walls in some lessons. They are all bottom set kids, very weak basic skills, pastoral problems, behavioural problems, attendance problems – you name it and its in there somewhere. There are one or two nice kids.

*(See group profile)*

Your observations were based on working together for the last 20 years. Why did you take the long view rather than just comment on one lesson?

I felt that commenting on one lesson would be very unfair. Sometimes in a lesson nothing happens. The kids get their work out and get on with it, or chaos breaks out. The one lesson would be just a snap shot.

*You said that relationships are very good between these pupils and me. What happens? How is this so?*

Like I said in my observations you tend to be consistent, there is an informal feel to the lessons and confrontation is rare...they react positively when they are made to feel that there is someone taking an interest in them. I think too the fact that the kids all know you is a major factor – we've taught the parents in many cases, the kids have had us since year 7. The kids talk in the yard, they work out who does what.

I said as well about enthusiasm being a key factor in getting on with this group of pupils.

*Can you describe my enthusiasm?*

Yes, because it's probably the same as mine. There are about five or six parts to it. You're enthusiastic about the subject – it's practical, you can make it and take it home, these tools and machines are the same as in a factory – this gives the subject real word relevance. You're enthusiastic about the kids – that's the best one I've seen. I feel sometimes that we are enthusiastic because enthusiasm is infectious. If we are not enthusiastic then we can't expect the kids to take an active interest in the subject. Being enthusiastic on a Monday morning is difficult! You seem to have a high tolerance of failure; you often talk about making mistakes. Not getting it right first time is OK with you. Mistakes cause opportunities to learn and to design.

*Learn and design?*

We both believe in kids learning through doing. We use plenty of scrap material and try and get them to develop their practical skills. You get them to evaluate each attempt, to mark their own work and to say what they need to do to improve. There's the secret box job, for example. When a kid messes up a corner joint, you don't say throw it out and start again, you say how can we get around this problem? Getting around the problem involves solving design problems like if we make the box smaller will it still hold what we want it to. This makes the kids think and, perhaps most importantly tells them that their efforts are not complete rubbish. Their efforts can be developed; they are of value. ("They" in terms of their efforts and "they" in terms of themselves.)

*You said that pupils are encouraged to pick their own project. How important do you feel this is?*

Taking ownership of a project is essential at any level. With this group of pupils I feel that it is particularly important. Some do pick their own feasible project;

others have to be carefully steered away from ideas that we know are not going to work. We know in reality that not many really pick their own project. You guide them through the use of exemplar projects into particular areas. The trick is to get the kids to think that it is their choice. You show them a garden bench and folder from some one in year 11 when they are choosing their project in year 10. The folder and the bench look great. You then ask them if any of them would like to make a bench. The seeds have been sown and a couple say yes. You do the same for another 4 or 5 projects until the whole group has "picked their own project".

*How significant is the extra time that this group has?*

I believe that the double time that this group has is central to the success of the course. They have extra time to make mistakes, to develop skills, to develop standards, to develop a working relationship with us.

*To develop standards?*

Some of these have never produced anything in school of any worth. They know that they are the dull class. Part of the extra time goes to us trying to make them believe that they can produce something that they can be pleased or proud of, something that they can put their name to. We've seen kids bin folder work – not because it's rubbish, but because they want to do it better.

*How important is the use of exemplar work?*

As I said there are three-dimensional, made, real products and the completed design folders to go with the jobs. The pupils can see exactly what is required and why they are being asked to do things - like research and evaluations. It helps the pupils in project selection, to set standards for themselves and to understand better the concept of long term planning. Planning of any kind is difficult with this type of group. The other thing that I thought of is that they know that the pupil is from this school. This is not pie in the sky work taken out

of some glossy magazine, or the work of kids from a posh school. It makes the work feasible, attainable and realistic.

*What about the pace of the lesson?*

The lesson tends to operate on a quick talk / 10 minute activity basis, or there about.

It's difficult to gauge exactly, you need a feel for it. Sometimes they can go on for 20 minutes or longer. It is a good way of keeping the class focussed.

*And the issue of homework?*

I think that being realistic with this group is vital to your sanity. They've got extra time to get through the course in school. Most of the kids come to school with nothing apart from trainers and baseball cap – no pens / geometry sets. What would happen if you insisted on homework? I suppose that 2 or 3 of them might have a stab at it. What would you do with the rest? Would they be punished? How many of these have the facilities to do homework at home?

## **Interview with T 2**

*You said that the group had matured and was getting on better, what did you mean by this?*

I remember the group in year 10. They were very immature there was a lot of petty bickering between the members of different groups. Now, at Easter time, in year 11 they seem to have grown up and are helping each other more. Boys who had serious attitude problems are now helping the more timid kids in the class.

*Do you think that this is because they are older?*

No because it doesn't happen so much, if at all, in other lessons. In other lessons there is still a lot of winding up. The girls are always fine but it's the

usual suspects that are still causing problems – 1112, 1105 and of course 1109.

*Why do you think that this does not happen in Design and Technology lessons?*

Three things. They enjoy the subject, especially the practical because they can see what they are doing, what needs to be done. They get on well with the Design and Technology teachers. They like to help out some one else because they can show that they can do something better than someone else. 1109, for example cut out 1106's tabletop. 1106 wanted it a funny shape but he wasn't confident enough to use the jigsaw. 1109 is excellent with machines; he cut it out as accurately as you. The class was very impressed with his work.

You mentioned that attendance with some of the boys had improved. Had their attendance improved in general or just in Design and Technology lessons?

Some of the group's attendance had got a lot worst since Christmas in Year 11, but attendance in Design and Technology lessons is good. I spend all day with this group, unless there is Design and Technology first lesson, 1105, 1106, and 1109 don't come in until break time. They bunk off or are isolated from some lessons – 1109 can't go to maths any more.

*You said that they work better on their folders in this lesson, than other lessons, because they are doing something they really like and can see something at the end of it. A bench or coffee table looks better to them than a slip of paper with exam results printed on it. How important is the end three-dimensional product?*

I think that it is very important. They don't seem to mind so much doing drawings or writing or finding out stuff when they understand what it's for and why they are doing it. Getting a good mark for an essay isn't cool but making a good job is. It's like having their first car – the clapped out Vauxhall Nova. They can polish it and stand by the side of it, even use it.

*You mentioned that the department as a whole treat them as the adults they are becoming and that there is a great deal of respect between both parties due to this fact. Why do you feel that this is so important?*

A couple of things - My husband was working at their age, 25 years ago they wouldn't be in school. They are at that age when they are certainly not kids. Their life out of school, despite their ages, is very adult. When a Design and Technology teacher blows up with them it's usually a very serious matter – health and safety for instance. They know that if they were in an adult world they would have had a bollocking for doing the same thing.

It's like I said about the fair treatment. The Design and Technology staff seem to be fairly consistent – compared to some staff. The kids know where they are with you and that helps a lot to stop blow-ups from happening.

*Can we explain the term – slightly mixed group?*

In year 10 there was a class of 18, my 2 were from the unit, (Hearing and visually impaired unit) there were 10 or so that had always been Special needs and then there was at least 4 who were bright enough to be in the other group, (mainstream Design and Technology group) but came here thinking that they were better than the rest. This caused some problems in year 10 but they have either gone elsewhere, (one pupil is in prison) or settled in with the rest of the group.

### **Interview with T3**

*You said that the children had used a range of skills including number, measuring and problem solving, why draw attention to this, doesn't it happen in all subjects?*

It should happen in all subjects and it often does. I am surprised as to how effectively these skills are developed in Design and Technology.

*Why do you think that this is so?*

I see a major factor as the subject itself; making things that the children relate to. When the children have to make something they have to measure, make calculations and solve problems. They do this in maths obviously but it is a paper exercise. The children, if they get jobs, are likely to have some form of manual employment – building trades perhaps. They are unlikely to do much paper problem solving. I have a theory that it is almost a sort of subconscious thing. The children work out what they perceive is going to be useful to them in later life. Things like French, core Welsh and RE tend to go out the window. The way the subject is taught is equally important. All the Design and Technology staff make an effort to get on with these children. They can be very demanding. The staff all emphasis the relevance bit – “this machine is real exactly like the one you would use in a factory, the workshops have Health and Safety rules the same as if you had a real job”

You mentioned that when you observed the children they worked together both in small groups and as pairs. How significant do you feel this factor to be?

I feel that getting these children to work together, to collaborate in any way, is often an achievement in itself. As I touched on above, these children are not going to learn for learning's sake. They are not set one who will retire to the library to research and work unsupervised. These children need all the support that they can get, from teachers and fellow pupils. I am always impressed with the development of social skills as a by-product of group work in Design and Technology. They help each other, and have to learn to share. When you have as little as some of these, to share what you've got is very difficult.

*Two points from your last comments - When you have as little as some of these – can you explain?*

Have as little in many ways: – financially, most of the parents are unemployed or have very low skill, low pay employment; academically, at this stage in year 11 they know exactly where they stand in the academic pecking order; socially,

they are locked into a narrow subculture, poor language skills and coping strategies.

*The development of social skills? Doesn't this happen elsewhere as well?*

Yes, but again it seems to be more overt in Design and Technology. It comes back to my earlier comment. It's a combination of factors. The practicalities of the subject – “Can I have that screwdriver?” - opens up a complete spectrum of responses ranging from F off! to of course you can, I'll give you a hand to put those screws in. The reinforcing of the real world element by staff – I often hear staff say you have to learn to queue, there's only one band saw. Simple relevant reality.

Perhaps one of my most encouraging observations was to see them helping each other without being asked to do so. Again simple examples – holding things to be sawn, gluing projects up, getting tools for each other – but yet significant for this group of pupils.

*You spoke about developing confidence, can you explain?*

I have known 1109 for all his 5 years at this school. He has lots of peer confidence; he is jack the lad. He has never had any confidence in his own ability. That's why he plays up in class, to cover up for his own academic inadequacies. I have never known 1109 to be so proud of anything that he had achieved in school as he is with his GCSE project. He wants to show it to you at every opportunity. The same could be said for a considerable number of the group.

You also mentioned the phrase “recognise acceptable behaviour”. What did you mean by that?

I am certain that their behaviour is better in Design and Technology than in other lessons. We meet regularly to discuss and monitor progress of all the pupils on the special educational needs register. This would include most of this class. We get verbal feedback and reports from the support assistants and the special needs support staff about progress. Progress means not just

academic progress but behavioural progress. These reports are backed up by teacher referrals to the Sleuth system. This provides a more quantitative picture of what's going on and where it is happening. The feedback we get at meetings is that the pupils' behaviour is better in Design and Technology than in other subjects. They seem to be more mature and willing to cooperate.

**Appendix 2.3 – Interviews - Pupil perceptions of D&T lessons- *this section contains an example of a pupil interview transcript***

Relationships Tangibility Relevant Relationship	In D&T you can <b>have a laugh</b> and the lessons are interesting, you <b>can see what you are doing</b> .  In D&T the teachers <b>are interested</b> in us and talk to us about things outside school.
Relevant Practical	I like doing <b>practical subjects</b> because it's like having a proper job – using tools and machines and stuff. In some subjects like History all you do is talk and write.
Prizing	<b>D&amp;T is the only GCSE</b> subject I got entered for.
Relationship Practical	You get <b>treated like an adult</b> , you get to do things, use machines and <b>make things</b>
Prizing	In D&T we can <b>have the radio on</b> .
Relevant Praise	When I took my job home <b>even my father</b> said that it was good.
Relationship	D&T is the only subject I enjoy doing. In some subjects they <b>treat us like shit</b> ,
Options / compulsory subjects Relationships	I hate doing Welsh – I would never pick <b>Welsh as a subject but the school makes you do it</b> . In some lessons we we get shouted at as soon as we go in. Every one tells us to do COEAs and <b>treats us like little kids</b> .
Relationships	We never get the good teachers we always get the ones who are on supply and who don't come back next week.
Scaffolding Prizing	When we do our folders you <b>tell us what to do and we can use the computers and coloured paper to get our work to look like the good work that you show us</b>
Relationships Option Choice	My brother did <b>GCSEs he said that COEAs</b> were for the thickees.  Everybody knows that <b>COEAs are not as good as GCSEs</b> – my father is a builder and he has never even heard of them.
Relationships	<b>I don't like Mr 4 and he don't like me</b> .
Option Choice	<b>I didn't want to do COEA History, I don't like History but there was nothing else for me to take in the option</b> because Health and Social is a girls subject.
Prizing / Option Choice	<b>Mr. 4 said that IT was full up in both classes</b> .

## Appendix 2.4

**Interview with SENCO** - *this section contains transcripts of the interviews with the SENCO, and a Teacher Aid. These were used to clarify issues recorded on the observation pro-forma.*

*My questions in italics, responses in normal script*

*Can you tell me first of all about the lessons that you recorded no reference to relevance?*

All the lessons were “ok” lessons, they just didn’t make reference to relevance.

*What do you mean by “ok”?*

The content of the lesson was appropriate to the ability of the class, the teacher had control, and work was done. The sort of lesson that comes out as “satisfactory” in an inspection. Nothing inspirational run of the mill sort of lesson. The English lesson, for example was to write a letter to a friend. There was good preparation, a template and exemplar work was discussed but there was no attempt to make a connection between the task and the pupils. Letter writing is part of their GCSE course but would any, or will any write a letter to a friend? When was the last time you wrote a letter to a friend? History, music and Welsh tend to rely on worksheets and the mode of teaching tends to be didactic. It is obvious in some lessons that the teacher doesn’t want the group in the classroom. There is no warmth of relationship, but that’s another story.

*What about the lessons you observed that referred to relevance?*

I would say that these lessons tended to be better than the other lessons. I described the “ok” lesson above, the difference was using relevance is that there was the opportunity to spark a connection. Where the pupils could say I need to know this. My 2 observations of relevance in maths were in the same lesson. Maths follow a text book. The lesson was very simple algebra and the class had switched off at the very mention of the word. The teacher strayed from the prescribed text and started to talk about money and buying things,

things that were relevant to the pupils –CDs mobile phones, (why does it always have to be fruit and veg in maths text books?). The lesson then went on to look at buying talk time for mobile phones and used the simple algebra to work out the best deal. The teacher then spoke about how you would need to be able to carry out similar calculations in simple shopping tasks. Both criteria were satisfied, (A) “relevant” connected to the present, situational; and (B) “relevant” preparation for a particular purpose.

The references in Science came in the 1 lesson. The lesson was about health and smoking. Over half of the class smoke. The teacher divided them up into 2 groups, smokers and non-smokers and used an exercise bike and a pulse monitor to test fitness. The usual health warnings were given and the results of the experiment were self-evident. This lesson also included a reference to pastoral relevance. The teacher empathised with the smokers and realised how difficult it was to break the habit. However, the issue of smoking proved to be contentious. Despite the first hand evidence of the experiment some of the smokers did not see that the health warnings were relevant to them. They were unwilling to accept that their present actions had future implications. This is a typical reaction from this group of pupils. The teacher gave relevant pastoral examples of how individuals in the class had not thought through their actions. As well as (A) “relevant” connected to the present, situational; and (B) “relevant” preparation for a particular purpose there was also reference to (C) pastoral relevance, using a real life experience that the pupils can connect with to illustrate a point.

In the 2 Design and technology lessons I recorded 15 references in 2 lessons. Both lessons were quite similar although they were with different teachers, one of which was the researcher. The researcher made 9 references to relevance, the other teacher 6.

*There is a sensitising factor, we as a Delphi group may have become too close to the research and are lacking in objectivity. 9 in 1 lesson, from me! Do you think that I was playing to the gallery?*

You may have been, but I would still maintain that it was fairly typical. The observations may have only been a snap shot but since we have been talking about relevance I have become more aware of it and have picked up on references across the school. Design and technology lessons in general seem always to pick up on the relevance theme. The other Design and technology teacher scored 6 in his 1 lesson. My formal recording of observations may be over a short period but my experience of teaching and learning across the subjects in this school is over a period of 10 years.

Your lesson was about finishing off their boxes / racks. It started with a demonstration of using the belt sander / health and safety dust extraction –“if you had a job doing this”, then other grades of glass paper – heading for the “shop finish – would you buy this job in a shop?” Then some bad language between 2 pupils gave the response from you “if you talked to some one else like that in town on a Saturday night you would get your head kicked in!” Then after about 25 minutes another demo about using sanding sealer –“you need to know about this to get a good finish” then a clear tangible demonstration of a well finished off cut –“touch it feel it, would you buy this in the shop” At the end you did a group discussion on the part finished jobs and talked about cost and profit – materials, labour – could you make a living by making your products? How much would you pay for this in a shop?

What makes it easier for me to record is that you tend to make announcements at intervals throughout the lesson which herald the relevant bits –“This is important.. You need to know how to do this....Watch or you could get hurt..... This will be really useful for you.....Would you speak like that at home?”

What is an “interval”? A critical period of time; the duration of the classes’ engagement on a task. It depends on the class, the task and the teacher’s ability to sense when things were shifting away from engagement.

The other lesson was a food lesson. Every food lesson starts with hand washing and a reference to real world relevance. “Don’t moan about it if you had a job in a restaurant you would have to do this.....” The lesson was a

follow up theory lesson on a previous lesson where they had made bread roles. There was an evaluation of their product and a selection of bought in bread roles to compare against, factors like taste, appearance, cost. The food teacher runs her room very much in a “this is a kitchen” sort of way and emphasis the difference between her room and a classroom. She always makes reference to the real world and the world of work. Again there is this tendency to punctuate the lesson with “This is important.. You need to know how to do this” utterances.

*The punctuated utterances – how significant do you feel that these are in promoting relevance?*

I believe that they are very significant. They can break up a lesson into bite size chunks and to re-focus a class, especially this kind of class that has a shorter attention span than a more able class.

### **Comment**

The initial follow up interview ended at this point. It was agreed that it would be written up in a format similar to that shown above and returned to the interviewee to be checked. The verified text would then be reflected on, analysed and cross referenced with findings from the other follow up interview with the teacher aid.

### **Interview with Teacher Aid**

*My questions in italics, responses in normal script*

*Can you tell me first of all about the lessons that you recorded no reference to relevance?*

These lessons tend to be workbook or work sheet lessons. The teacher has prepared work for the class, sometimes it's photocopied, and sometimes the stuff is years old. The kids can tell straight away how much thought has gone into the preparation. If the work has been developed for them or just hand-me-down stuff. The other thing I think about these lessons is that the teacher

doesn't get on that well with the pupils. The teacher says "Ok here is today's work get on with it" sort of thing. They don't try to make the work interesting. As we both know its not surprising that the kids play up sometimes.

*What about the lessons you observed that referred to relevance?*

Maths often uses the relevance thing. Some of the class still get trouble with the time – the 24-hour clock. He teased them a bit with talking about the time and having a date with someone. It really worked because it made knowing about the time relevant to them. They understood that it was important to them. (A) "relevant" connected to the present, situational; and (B) "relevant" preparation for a particular purpose I can't understand why he doesn't make more of it because maths is everywhere when you grow up. The other lesson was more of a workbook lesson.

Science was annual sex education / reproduction lesson. This lesson is always going to be relevant to the kids. The sniggering is just a cover up for a bit of embarrassment, all of them are on the edge of their seats. They have difficulty with most scientific names have no problem spelling vagina, penis and erection. The teacher also puts in a pastoral dimension and gives examples, not named but everyone knows whom she is talking about, of the consequences of becoming pregnant at a young age. (A) "relevant" connected to the present, situational; and (B) "relevant" preparation for a particular purpose, and (C) pastoral relevance, The other lesson was more of a workbook lesson.

The PE lesson was about throwing the javelin. The teacher gave a clear demonstration on the skills and processes needed and the health and safety aspects. She said, "You need to watch closely if you want to throw this javelin the furthest, it's not about how strong you are but how good your technique is". (A) "relevant" connected to the present, situational

Design and technology lessons always seem to be peppered with references to relevance. I think that it is because it is a practical lesson and the teacher has to show the kids what's going to happen. I counted 6 in one lesson and 5

in the other, (neither of which were with the researcher). One lesson was using the computers to do a working drawing. These pupils don't get much access to the computers as the other kids. They can sometimes be a bit excited when they are allowed on. The teacher was careful to prepare them in the workshop before going to the ICT suite. He spoke about the real world, showing them CAD drawings that had been done by past pupils now working in industry and then showing them simple CAD drawings done by pupils in the same year group. The class had already done rough working drawings so he spoke about using them to make their jobs. "Could someone else make your job from your drawing?" he asked, adding, "Hitachi, a local firm, design products locally but send drawings from the factory all around the world to have them manufactured".

This introduction to the lesson took about 10 minutes but it made the group aware of the relevance of what they were doing. The lesson continued with a structured demonstration, step-by-step, on how to produce a simple 2 D design drawing. "To get this on your screen you will need to do this, this and this". (A) "relevant" connected to the present, situational; and (B) "relevant" preparation for a particular purpose,

A part of the other design and technology lesson was a recap on how to use the mortice machine – health and safety – "watch or you could get hurt", real life references – "in industry this would be set up to cut a load of gate frames one after the other" and the fact that it is the pupils own work – "you set up the machine as I have just shown you, double check that it is set up properly, it's your job". The pupils were really switched on because they didn't want to look stupid by mucking up their work or not knowing how to use the machine. (A) "relevant" connected to the present, situational; and (B) "relevant" preparation for a particular purpose,

*There is a sensitising factor, we as a Delphi group may have become too close to the research and are lacking in objectivity. Do you think that because we have talked about relevance in Design and technology so much in the past that*

*you might be more aware of it when it occurs in Design and technology as opposed to other lessons?*

I can't be sure, that may be the case. All I am sure about is that in Design and technology the lessons seem to be structured a bit at a time. You all tell or show these pupils something at regular intervals throughout the lesson.

*How long is an interval?* A time of anything between 2 and 15 minutes. It depends on how things are going in the lesson.

Because the lessons tend to be practical the things that you tell or show the kids have immediate relevance to them. They need to know or they would look stupid. It seems to me to be much more difficult to do this in other subjects for these pupils.

I have worked at the school for 5 years and supported in lessons for that amount of time. I believe that my recorded observations over the week of lessons are a fairly accurate picture of what happens, in general, in most lessons. I am more aware of the use of relevance in Design and technology because that's where I notice it the most.

### **Comment**

The initial follow up interview ended at this point. It was agreed that it would be written up in a format similar to that shown above and returned to the interviewee to be checked. The verified text would then be reflected on, analysed and cross referenced with findings from the other follow up interview with the teacher aid.

Both the SENCO and the teacher's aide made minor adjustments to the transcript. What is printed above is the agreed version of both interviews.

## **Appendix 3.1**

**Format of school visits** – *This section outlines the topics of the discussions that took place during the visits to the 3 other schools.*

### **Discussion of prior research**

General introduction - Curriculum and staffing constraints conspired to create a distinctive group in design and technology for low ability and disaffected pupils: a “sink” group. The group consisted of a maximum of 16 pupils, 70% of these being boys. Analysis of GCSE results over a three-year period identified that this group were gaining their best results in design and technology. Ipsitive analysis, comparing the same pupils’ results in different subjects, showed an average of +2.0 for the period. The Head of design and technology sought to identify factors that contributed to this.

This research project began with an initial pilot case study that focused on the perceptions of this disaffected and low ability group in relation to design and technology, school and themselves. This appeared to show that the pupils had a positive perception of design and technology at the school. A subsequent pilot case study identified a range of factors that contributed to the development of the pupils’ positive perception of the subject. Factors such as good relationships between staff and pupils, the practical nature of the subject and the use of group work emerged. Won’t need this in the final version

### **Discussion of the terms used**

Intrinsic motivation –Extrinsic motivation –Expectation of success

Opportunities to satisfy all these forms of motivation with the design and technology lessons observed.

Low ability - using similar data to form a group profile

Scaffolding - allows the adult to control sufficient elements of an activity to enable a pupil to achieve the requisite skill or understanding, and then progressively remove the support so that the pupil can function autonomously.

Examples of this approach are the use of exemplar material, the high tolerance of making mistakes

Disaffected - the relationship between their levels of motivation and their self-esteem. Hustler *et al*, (1998:14 –15) identifies four strands that are indicative of the disaffected:

- School is not perceived as being relevant
- The pupils had developed a negative relationship with the school or particular staff
- Many of the pupils had “something else” happening in their lives - problems with relationships. Schooling reinforces a view of the pupils as being not worthy and dismantles their self-esteem

Learning - an enduring change in an individual that can be described in terms of change of insight, behaviour, perception, or motivation, or a combination of these factors.

A range of learning strategies are employed: practical work, use of exemplar material, collaborative learning, scaffolding, critical inputs,

Engagement in learning - assessing the depth of engagement in learning will be problematic. The pupil will be assessed as being engaged in learning unless there is evidence of disengagement. This evidence could range from passive disinterest to active disruptive behaviour.

Several issues emerge. Broader issues are: the quality of relationships, the relevance and practical nature of the subject, developing self-esteem and confidence, improving social skills and behaviour.

The more focussed issues are: timing and lesson management, use of exemplar work, group work, use of ICT, development of key skills through design and technology and relevance.

Relevance - The preliminary findings regarding the pupils' perceived relevance of the subject appears to contrast that which is gleaned from the literature.

What is the pupils' perception of the term relevant?

The pupils subscribe to the following definitions:

Relevant for the future / for a career / for an examination

Relevant for the present / need to complete a task / enjoyable / health and safety

Relevant in a pastoral sense / relate to real world situations

What factors contribute to the development of positive, relevant image of design and technology at this school?

How significant a factor could the positive, relevant image of design and technology at this school be in engaging these pupils in learning?

### Discussion of the methodology – the semi-structured interview

Below is a copy of part of the modified and augmented schedule. Ex1 and 2 are examples to show pupils how the questions work:

	Task 1	6	5	4	3	2	1
Ex1	Rap music is the best		*				
Ex2	There should be more football on the TV			*			
	<b>A subject is relevant when</b>						
<b>A</b>	The subject is useful to know about now, <i>at this moment, when you are doing the subject you think that it is useful as you are doing it, if you agree really strongly then tick box 6, if you agree tick box 4, if you disagree tick box 3 and really disagree tick box 1.</i>						
<b>B</b>	The subject is interesting, <i>the subject isn't boring, you are interested in what is going on in the lesson, you are not bored by what the teacher is telling you or by the work that you are doing</i>						

### Interview schedule

How long have you taught at this school?

Can you describe the focus group in terms of: their abilities, what their target grades at GCSE will be, their attendance, their motivation, their ability to remain on task, behavioural / health and safety concerns

How would you describe your relationship with the group?

Describe a typical lesson

	<b>Rating scale to compare responses – 6 is high</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
	<b>The focus group</b>						
<b>A</b>	Length of service – <i>10 year + = 6, 5 years+ = 4</i>						
<b>B</b>	Ability of pupils in this specific group						
<b>C</b>	Target grades						
<b>D</b>	Attendance						
<b>E</b>	Motivation						
<b>F</b>	Ability to remain on task						
<b>G</b>	Behavioural / health and safety concerns						
<b>H</b>	Quality of relationship						
<b>I</b>	Typical lesson						

How, in your opinion, is the relevance of design and technology perceived at this school in terms of: the senior management, the staff, the pupils, the parents, and the community?

	<b>Rating scale to compare responses – 6 is high How design and technology is perceived</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>A</b>	Senior management						
<b>B</b>	Staff						
<b>C</b>	Pupils						
<b>D</b>	Parents						
<b>E</b>	Community						

### **Teaching strategies**

Before the lesson starts - is the subject matter relevant to the pupils? How much input have the pupil had in the selection of a relevant topic? Has any prior discussion been teacher led to direct towards certain topics, for pupils to gain ownership?

At the start of the lesson – explicit aims – short-term – check for understanding

Activity – timing gauged by pupil engagement to the task

Re-focussing / critical inputs –

Immediate relevance – *need to know to do this*

Real world – *in a factory they do this*

Future career – *if you are thinking of being a ???? you would need to do this*

Future life – *this will be useful for you when you have a house of your own*

Health and safety – *watch this or you may hurt yourself*

Use of praise / exemplar material

***This is good work, this is what John has done***

Reduce fear of mistakes

***We all make mistakes, everybody learns from mistakes, you learn more when you don't get it right first time***

Self assessment / group assessment

***What do the class think? What do you think?***

Have you ever analysed your own teaching methodology?

Have you ever reflected on the issue of relevance?

Have you ever consciously attempted to make a lesson more relevant?

	<b>Rating scale to compare responses – How design and technology is perceived 6 is high</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>A</b>	Have you ever analysed your own teaching methodology?						
<b>B</b>	Have you ever reflected on the issue of relevance?						
<b>C</b>	Have you ever consciously attempted to make a lesson more relevant?						
<b>D</b>	Have you ever considered the relevance of the subject matter?						
<b>E</b>	Are lesson aims made explicit at the start?						
<b>F</b>	How aware are you of timing in a lesson						
<b>G</b>	How frequently in a lesson do you use the following:						
	Immediate relevance						
	Real world						
	Future career						
	Future life						
	Health and safety						
	Use of praise						
	Exemplar material						
	Reduce fear of mistakes						
	Self assessment / group assessment						

## **Appendix 3.2**

**Interview transcripts** – *this section contains transcripts of the interviews with the 3 staff from the other schools. The information was used to build up a profile of the staff and their perceptions.*

### **School B**

*How long have you taught at this school?* – 2 years teaching experience in total. This is my first teaching post.

*Can you describe the focus group in terms of:*

*their abilities* – this is a low ability group, the bottom set in year 10, poor communication skills in general, very poor writing skills, graphics, even verbal skills are poor. There are some “sharper” boys in the group but their attendance is erratic

*Their target grades at GCSE* - This group is an Entry-level group, (Entry-level is a course designed by the WJEC specifically for low ability pupils. With the advent of GCSE it was anticipated that the course would be phased out. However, this school still uses it as an externally credited qualification.) I do not have any target grades at GCSE for these pupils – They would be unlikely to score a grade G or above.

*Attendance* – There are 17 boys on the register. Attendance is mostly ok the group is rarely below 14. There is 1 boy who I have not seen this term and 2 who have had brief exclusions

*Motivation / Ability to remain on task* – Erratic, sometimes they want to work, sometimes they want to be confrontational, sometimes they are over enthusiastic and want to finish first and sometimes they do not want to finish at all – they wreck their own work

*Behavioural / health and safety concerns* – There have been a few occasions when things have gone particularly bad – I had to break up a fight between 2

of them, some of them can be very negative and slag each other off. Sometimes work gets deliberately damaged or gets stolen. There has been nothing directly against me but I have had to use the school referral system on several occasions – calling in the head of department or another senior teacher and then farming out the odd pupil who refuses to cooperate.

*How would you describe your relationship with the group?* – Most of the time it's quite good. The above concerns are fairly isolated. There is a big difference when certain pupils are absent. I can't say that I look forward to taking them, but at the same time I do not lose sleep at the thought of teaching the group.

*Describe a typical lesson* – Lessons are project based so it depends where we are with the project. We do not do much writing or drawing; this tends to start them off. I try to make the lessons as practical as I can. For example at the moment we are following the departmental scheme of work so these pupils are making a desk tidy out of some wood and plastic. I demonstrate a process then the class does a practical based on the demonstration. After that we do a work sheet based on what they have just completed.

*How, in your opinion, is the relevance of design and technology perceived at this school in terms of: the senior management-* It's a difficult question after only being here for 2 years. I think that the school is still rooted in its historical grammar school past. I have not heard any senior manager publicly speak about design and technology in staff meetings.

*The staff* – Same as above. We do get our legs pulled a bit – the “chippies” and we get asked to mend things so we do have our uses.

*The pupils* – This group of pupils have trouble sometimes seeing anything that is relevant. Sometimes they just do not want to be in school. Some of the pupils though have said that they are looking for a job in the trades and so to them I suppose the subject must be relevant

*The parents, and the community?* After just 2 years I feel unqualified to comment. My gut feeling is that some parents would think of design and technology as very relevant but there are some parents at this school from more affluent areas that might not find the subject relevant

*Have you ever analysed your own teaching methodology?* Yes as student I had to write lesson evaluations and keep a learning diary. It was quite useful at the time but I just don't have the time to continue with one now that I full time.

*Have you ever reflected on the issue of relevance?* No

*Have you ever consciously attempted to make a lesson more relevant?* No, not consciously

*Have you ever considered the relevance of the subject matter?* Yes, for example the desk tidy job for year 10. I don't think it works at all. It would be better if they had a project that they would feel is relevant

*Are lesson aims made explicit at the start?* Yes. I always try to set out the aims of the lesson at the start

*How aware are you of timing in a lesson?* I am aware that this is an area that I probably need to work on. My main problem is finishing too early and this can create problems at the end of the lesson

*How frequently in a lesson do you use the following:*

Very frequently = 6, Sometimes = 4, Occasionally = 3 2 No = 1

Immediate relevance – frequently

Real world - sometimes

Future career - occasionally

Future life - occasionally

Health and safety - very frequently

Use of praise - sometimes

Exemplar material - occasionally

Reduce fear of mistakes - occasionally

Self assessment / group assessment - occasionally

## **School C**

How long have you taught at this school? – 4 years teaching at this school, 11 years experience in total – head of department at school C

Can you describe the focus group in terms of: their abilities – this is a low ability group, the bottom set in year 10. Reading ages are in general very low

Their target grades at GCSE – This group is entered for both GCSE and the Entry-level qualification. The target grades are mostly D to G but 2 pupils are predicted to score a grade C

Attendance – There are 19 pupils on the register, 12 boys and 7 girls. Attendance is good.

Motivation / Ability to remain on task – Rather erratic, sometimes they want to work; sometimes they do not want to work. It is difficult to predict. The class can work really well and then next lesson they can be a bit off the wall. If they are enjoying what they are doing they invariably work well.

Behavioural / health and safety concerns – Their behaviour is generally good. The school has very high expectations for pupil behaviour. There are occasionally minor problems related to immature behaviour rather than anything malicious

How would you describe your relationship with the group? – Most of the time it's good. There is a positive relationship between the pupils and me. I quite enjoy teaching the group there is less pressure than with an A level class, for example.

Describe a typical lesson – I always start with a talk and set out the learning objectives for the lesson. Then the activity starts. I monitor the activity and call them back into a group if the activity is not working as well as I had expected. I

find that this group needs more time and so the pace of the lesson is set to allow the pupils to finish things off.

How, in your opinion, is the relevance of design and technology perceived at this school in terms of: the senior management- I would say that the head does not see design and technology as a priority area. The department is strong in terms of pupil numbers and is adequately resourced.

The staff – I think there is split here. Some staff really believe in design and technology whilst others still have a dismissive attitude – it's ok for certain types of kids!

The pupils – I said that pupil numbers are high across the key stages so I suppose the pupils must think that design and technology is relevant in some way

The parents, and the community? At parents evenings I have not met many parents with a negative view. This contrasts with my previous school where some parents were very dismissive of the subject

Have you ever analysed your own teaching methodology? Yes but never formally or systematically. I have not written anything down but you do think about what works for you and what does not.

Have you ever reflected on the issue of relevance? No

Have you ever consciously attempted to make a lesson more relevant? No, not consciously

Have you ever considered the relevance of the subject matter? Yes, I have made changes to lessons and especially to projects to get them to be more relevant and up to date. Technology is changing rapidly, the subject needs to keep up with change.

Are lesson aims made explicit at the start? Yes. I always try to set out the aims of the lesson at the start

How aware are you of timing in a lesson? As I said I like to give plenty of time to complete. A balance needs to be struck between allowing sufficient time for pupils to complete a task well and maintaining interest with the ones who finish a task more quickly and efficiently

How frequently in a lesson do you use the following:

Immediate relevance – frequently

Real world - frequently

Future career - frequently

Future life - frequently

Health and safety – very frequently

Use of praise - frequently

Exemplar material - frequently

Reduce fear of mistakes – very frequently

Self assessment / group assessment –very frequently

## **School D**

How long have you taught at this school? – 16 years teaching at this school, 22 years experience in total – head of department at school D

Can you describe the focus group in terms of: their abilities – this is a low ability group, the bottom set in year 10. Reading ages are in general very low; most pupils have a reading age of at least 2 years behind their chronological age

Their target grades at GCSE – This group is entered for both GCSE and the Entry-level qualification. The target grades are mostly D to E but 5 pupils are predicted to score a grade C. The exam papers are tiered this group need to sit the lower tier because the language used, and the questions are more straightforward. This denies these pupils access to higher grades. Their

coursework may be, in some cases of a very high standard, but they would struggle with the higher tier paper.

Attendance – There are 17 pupils on the register. Attendance is good.

Motivation / Ability to remain on task – Very good, for the majority of the time. There are occasions where the girls are wound up, but that can happen to any class.

Behavioural / health and safety concerns – Their behaviour is good. The school has very high expectations for pupil behaviour. Breaches of the code of conduct are isolated.

How would you describe your relationship with the group? – Most of the time it's very good. There is a positive relationship between the pupils and me. I enjoy teaching the group, they tell me everything and we can become quite close. Sometimes I feel more like an agony aunt than a teacher.

Describe a typical lesson – The lesson usually starts with a talk and I set out the learning objectives for the lesson, but this is not always the case. Sometimes there is no formal start to the lesson – the girls remember from last lesson where they were and carry on. When there is new material to introduce then obviously there is a formal start to the lesson. The girls enjoy the practical nature of the lesson, we sometimes have the radio on, and the atmosphere is relaxed. I monitor the activities and sometimes stop the class to clear up any misconceptions or just correct misconceptions at an individual level.

How, in your opinion, is the relevance of design and technology perceived at this school in terms of: the senior management- The previous head refused to use the term “design and technology “ and continued with domestic science and needlework. The new head has been in post for 2 years and has been quietly neutral about the subject. She loudly supports the humanities.

The staff –I have noticed a change in attitude. When I first came here the school had just changed over from an all girls grammar school to a girls comprehensive. The then head's attitude expressed above was fairly reflective of the rest of the staff. New members of staff have arrived are far more supportive of the idea that girls should be taught design and technology and that the subject is relevant to all pupils.

The pupils – Pupil numbers are good at KS4; pupils opt to take the subject and we offer 4 focus areas: textiles, graphics, systems and control and catering. Resistant materials is popular at KS3 but the girls do not opt for it at KS4.

The parents, and the community? I feel quite successful in that I have “shop windowed” the department over the years. At open evenings there is always a display of the best work and we hold a fashion show

Have you ever analysed your own teaching methodology? Yes. I have been a mentor for student teachers and this opened my own mind up to how I actually teach. My results at GCSE are good so there must be lots of things that I do that are effective. I had to read some prescribed texts from the student teacher colleges and much of the good practice identified in the text is common sense and mirrors closely what I do in class

Have you ever reflected on the issue of relevance? No, not formally but I know that it is a useful ingredient. We all learn better when we accept the relevance of what we are learning.

Have you ever consciously attempted to make a lesson more relevant? Yes, I am sure that I have but at the same time I have not sat down and re-wrote lesson plans – if you think something works then you do it and you know that it might not work the next time

Have you ever considered the relevance of the subject matter? Yes, if you tune in to the kids you can get a lot of ideas from them. The techniques and the processes might be the same as the cooking apron circa 1965 but if you apply

it to a mobile phone holder, a beanie hat or an MP3 player then you stand a better chance of getting the pupils on your side.

Are lesson aims made explicit at the start? Yes. I always try to set out the aims of the lesson at the start, but as I said sometimes the lesson starts by itself with the pupils just getting on with it.

How aware are you of timing in a lesson? A vital ingredient. How long is an activity? When do you stop and re-focus? Getting the pace of the lesson right is so important. I observe student teachers labouring over a pristine lesson plan and see the pupils switching off because it has dragged on too long or has been rushed over too quickly.

How frequently in a lesson do you use the following:

Immediate relevance – very frequently

Real world - very frequently

Future career - frequently

Future life - frequently

Health and safety - very frequently

Use of praise - very frequently

Exemplar material - very frequently

Reduce fear of mistakes - frequently

Self assessment / group assessment - occasionally

### Appendix 3.3

**Data table** – this section contains an example of a completed data table, A1 indicates the initial response A2 the follow up response. The data were collected to assess any change in pupil perception after the teaching strategies were implemented.

#### Question 1 Finding out what relevant means to the pupil

	Six	Five	Four	Three	Two	One	Score
A1	1	4	4	-3	-2	-1	56
A2	2	5	5		-3		63
B1	6	6	3				78
B2	2	4	5	-2	-2		62
C1	3	9	3				78
C2	5	8	2				78
D1	3	6	3	-3			69
D2	3	6	4			-2	66
A1	7	3	5				77
A2	9	6					84
B1	6		6	-3			69
B2	5	3	4	-3			70
C1	6	6		-3			75
C2	6	6	3				78
D1	6	3	6				75
D2	6	6	3				78
A1	2	5	4	-2	-2		63
A2	4	6	3	-2			72
B1	6	9					81
B2	10	2	3				82
C1	6		6		-3		66
C2	6	3	4			-2	69
D1	6		6	-3			69
D2	5	5	5				75
A1	7	5	3				79
A2	6	6	3				78
B1	6	6	3				78
B2	9	4	2				82

	Six	Five	Four	Three	Two	One	Score
C1	3	6	6				72
C2	5	5	5				73
D1	3	9	3				78
D2	5	7	3				77
A1	8	4	3				80
A2	9	3	3				81
B1	6			-9			63
B2	6	4	2	-3			73
C1	3	9	3				78
C2	4	8	3				76
D1	15						90
D2	15						90
A1	4	4	3	-3	-1		67
A2	4	4	4		-3		66
B1	15						90
B2	12	3					87
C1	9	3		-3			76
C2	8	4	3				70
D1	9	3	3				79
D2	10	2	3				72
A1	6	3	4	-2			73
A2	5	5	5				75
B1		3	9	-3			60
B2	3	2	10				68
C1	3	6	3	-3			69
C2	3	6	6				72
D1		9	6				69
D2	3	6	6				72
A1	2	4	5	-2	-2		62
A2	2	4	6			-1	63
B1	6			-9			63
B2	2	5	3	-3		-2	60
C1	6	6	3				78
C2	6	6	3				78
D1	9	3	3				81
D2	10	4			-1		82
A1	4	4	7				72
A2	5	4	3			-3	65

	Six	Five	Four	Three	Two	One	Score
B1	6			-9			63
B2	12	2	1				86
C1	6	6	3				78
C2	6	5	4				77
D1	9	3	3				81
D2	8	4	3				80
A1	5	4	2	-2	-1	-1	67
A2	4	4	5			-2	66
B1	6	9					81
B2	10	2	1				82
C1	6	6	3				78
C2	5	5	5				75
D1	7	8					82
D2	9	6					84

## **Autobiography**

I was brought up in a small South Wales village with a combination of non-conformist and trade union influences. Secondary education was at a “grammar” comprehensive school, (see glossary section). I found myself in the “top form”; pupils from my village were not supposed to be in this elevated position. As the youngest son I was encouraged to stay on to the sixth form and took four A levels: woodwork, metalwork, engineering drawing and English. I was selected to be Head Boy. Half of the staff signed a petition in protest of my selection because I was not studying “appropriate A levels”.

I cannot remember how I felt at the time but I have asked myself many questions: Why did teachers have different expectations of pupils from my village? Why were some teachers so opposed to those subjects that I had selected to study. These experiences have inevitably contributed to the way in which I have constructed my personal meanings.