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Pupils' Views and Experience of ICT in Secondary Schools.

Nusrat Haq

**A thesis submitted to the University of Huddersfield in partial fulfilment of the
requirements for the Degree of Doctor of Philosophy**

The University of Huddersfield

School of Education and Professional development

2006

Abstract

Information and Communication Technology (ICT) is the focus of a great deal of attention, both in terms of, policy, its implementation and research. It could be considered the most highly scrutinised of all subjects. For more than 30 years there have been many statements made about its impact on everyday life. Just as ICT has subtly transformed the working practices and communication system of the world, so it has been assured to make an equal, and more obviously positive, impact on the world of education.

This thesis explores the impact of ICT on the attitudes, habits and thoughts of pupils in secondary school. Acknowledging the potential, and interest in different programmes, it looks at ICT not as an isolated phenomenon, nor in terms of potential programmes and the efficacy of distance learning, but in the context in which it is used in schools. The thesis is based on exploring the ways in which pupils experience ICT in school rather than in their homes, and how they experience ICT as part of their daily school experience.

The first part of the thesis outlines the history of the impact of Technology, in the context of earlier media, and examines the many assertions of its power and the hopes of the impact of IT. It also traces the many complex ways in which the Information Technology can be used and have an impact, and the various theories that underly its potential. It makes it clear that there is comparatively little empirical research on the impact of ICT in the school context. Research on particular programmes and lessons abounds but not research on the secondary pupils' attitudes and experience as a whole.

The methodology used is a mixture of observation, questionnaire and interviews. In such a complex subject it was considered important to use triangulation to explore the impact of ICT; from its uses as part of the school curriculum, to its relationship with, other subjects. The most significant evidence is perhaps, derived from lengthy semi-structured interviews (as well as the questionnaire). Secondary school pupils in years 9 and 10 in six schools (with contrasting socio economic catchments) completed questionnaires and interviews.

Whilst the thesis explores many aspects of the pupils' experience of ICT it does so in the context of day-to-day school life. The central point is however, the ways in which pupils think of school life generally, and the impact of ICT within this context. Any disappointment with any lack of fulfilment of the great hopes of ICT is perhaps explained by of how schools are run as institutions. They perhaps have not changed in any radical way to accommodate the new technology. The acceptance of the inevitability of computers, and their use in systems of communication (and the pleasure at home) is matched by the acceptance that school is an experience demonstrated by its social rather than academic aspects, in which ICT is just another lesson.

Acknowledgement

I would like to sincerely thank and express my deep gratitude to my supervisor Professor C. Cullingford, the Head of Research at the University of Huddersfield for his valuable advice, assistance and encouragement throughout this research. Without his encouragement and constant guidance I could not have finished this research. He was always there to meet, listen and talk about ideas, to proof read, to give insightful comments and ask me questions to help me through my problems. I am also deeply indebted to my second supervisors Dr John Mc Comish and Dr Pete Sanderson for their advice, valuable comments, positive suggestions, continuous encouragement and support throughout all these years. Their comments at various stages of this research and writing this thesis were gratefully received.

In addition I would to extend my deep appreciation to all staff of the School of Education for providing a friendly atmosphere. Special thanks go to the Research Committee, and other staff members for their permission and moral support to carry out this research. I am grateful to the staff of the library for their help in obtaining valuable materials.

I also wish to thank my friends Lynn Myland and Mohan S Sokhal (MBE, JP) for listening to my frustrations, for believing in me and keeping me in good spirits. I gratefully acknowledge my debts to all the persons mentioned, and many others I have not named. However, I only, am responsible for the views expressed in this work.

Finally, I am deeply indebted to my parents (Mum you are always with me) and thank them for giving me life in the first place, for educating me, for their unconditional support and encouragement to pursue my interests, their prayers for me to get my degree,

for their patience during the years of study, and my thanks to my brothers, for encouragement. I dedicate this thesis to my Mother.

The Researcher,

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CHAPTER 1

INTRODUCTION AND STATEMENT OF THE PROBLEM

Chapter 1

Introduction and Statement of the Problem

The main aim of this study is to examine secondary school pupils' use of and attitudes to Information and Communication Technology (ICT). There is a particular emphasis on the way pupils actually use the technology as opposed to how they ought to use it. The principal focus of this research is a detailed analysis of the pupils' attitudes and behaviour towards the use of computers at school, although research was also carried out into the use of computers at home.

Throughout the thesis the term ICT is used to describe the school subject Information and Communication Technology. The term Information Technology is used to describe Information Technology in its wider sense.

The detailed analysis will utilise a triangulation of research methods: observation, questionnaire and interview. This chapter provides an overall statement and identification of the problem, a rationale of the study, the need and importance of the study and the methodology and procedure.

1.1 Introduction

Over the last century we have experienced unparalleled rates of technological development leading to fundamental changes in our way of life and in the nature of society. Instructional technology is essentially a post World War II phenomenon. Since the end of the Second

World War the electronic computer has been a most significant influence on changing our way of life.

The role of computers and Information Technology (IT) has grown and expanded to such an extent that Information Technology is prevalent in virtually every aspect of daily life. For example, when shopping, computerized 'point of sale' electronic tills, with their accompanying credit facilities, are everywhere. In their homes, many more people are playing computer games, doing the domestic accounts using spreadsheet programmes, writing letters with word-processing applications, accessing the Internet or sending and receiving e-mails. Furthermore, at work, the computer has become a central component of everyday business life, becoming an indispensable tool in maximizing and improving work efficiency (especially in the field of financial/budgetary book-keeping/accounting), taking over from what were, previously, a series of quite laborious and time-intensive duties.

Calculators, computer games and many other electronic devices are now commonplace in people's homes, while the world of work has been transformed by such devices as robots and word-processors. Individuals come across computers every day of their lives (for example when banking, when making travel arrangements and when booking theatre tickets). Children are accustomed to computers and see them used in many different situations. This is why so much attention has been paid both to the potential of computers as a tool for learning and to the need for everyone to be skilled in the use of them.

Howe (1983) foresaw that microcomputer devices and techniques would affect the lives of everyone by the end of this century. Indeed, during the ten years following Howe's (and others') comments, it has been a widely-held view that such machines would eventually have an impact comparable to that of the printing press (McLuhan 1967) and bring about changes of a truly revolutionary nature.

There is no doubt that computers are getting more sophisticated, cheaper and ubiquitous.

Computers are changing in two ways:

1. They are getting more powerful, faster and can do more
2. They therefore give access to vast amounts of information.

Longworth (1983) suggested that the needs of the children of the second industrial revolution are markedly different from those of the first. They need the facility to think creatively about the uses and abuses of information. Longworth was encouraging educators to make full use of the computer's capabilities and prepare pupils to work with all types of new technology. This is a challenge that is still facing educators on a worldwide basis.

The potential of different media to enhance pupils' learning is not new. As early as the 1920s 'educational radio' was introduced into schools in order to receive educational programmes. In the 1970s this facility was given the different title, 'Interactive Radio Instruction' (Plomp 1996) but the purpose was the same (i.e. to broadcast educational programmes). In the 1950s Instructional Television (Plomp 1996) was introduced. Instructional Television consisted of programmes developed specifically for classroom use.

It was expected that television would bring about a big change in the educational system. It did indeed bring about changes in social life but it is a matter of conjecture whether or not it has had a major impact on schooling.

The use of ICT in schools as a learning tool is now commonplace. However, having access to technology is not the same as acquiring knowledge from the experience. The term 'educational technology' was introduced in the 1960's and is associated with the mainframe computers in education and learning. Tutorial software was developed and used in universities with the arrival of microcomputers in the late 1970s (Sewell 1990).

1.2 Rationale of the study

Information Technology has become like a siren song in education for the last 35-40 years. Policy makers and educationalists have kept reiterating that tomorrow, the next day or in the near future Information Technology is going to change the way things are. Levine (1995) claims that the advent of computer literacy is one avenue not only to recapture diminishing skills, but also to advance into a new renaissance. She asserts that Information Technology will transform our lives, our communication systems, our education system and our ways of getting new information. Stonier (1985) and Underwood and Underwood (1990) have said that Information Technology is going to change the way things are and will certainly change the ways in which information is delivered. Pupils can use teaching machines and other resource centres. Pupils would have access to all learning resources and would not need teachers, classrooms or schools. Pupils could work and learn at home and

could have access to lot of new information or they could be independent or autonomous learners. The question remains whether anything like this has actually happened.

The hope placed in new technology and the belief in its transforming power has been experienced before. When television was first introduced, it was believed that it was a wonderful invention that would transform ways of communication and the education system. People thought that television would replace traditional learning habits and even replace teachers. Without doubt television has profoundly affected our culture and the way we present and process information, but it has not fundamentally changed the nature of schooling. Television may create or reinforce personal prejudices (stereotyping) or conversely it may help remove them to a greater or lesser degree. It may shape our educational aspirations, encourage or even lower them by the images and personalities it portrays, but it does not fundamentally affect the educational process (Chu and Schramm 1967; Schramm 1977; Plomp 1996).

As new technologies emerge, we make decisions about integrating them into our behaviour. This phenomenon of responding to changing technology is also evident in the classroom, where teachers have to make similar decisions that affect the adoption of new instructional media. Change in the school system in general, and in teachers' behaviour in particular, often appears to be a slow and complex process. Recently many technologies such as microcomputers, television, videocassettes record and personal computers, and have been introduced into the classroom. It is not evident how many teachers have adopted new technologies for the purpose of enhancing their teaching. The theoretical framework of

the thesis is to explore whether the rhetorical hope placed in the transforming power of technology is matched by reality, given the extensive criticism of teachers' failure to employ the technology themselves.

The concern with the use of computers in school is long standing. The "Micro-electronic Education Programme (MEP) was first set up in 1981 by the Department of Education and Science (DES) and ran until at least 1986.

The aims of MEP were:

- To help schools to prepare children for life in a society where devices and systems based on microelectronics are commonplace and pervasive;
- To help teachers learn the technology they need in order to encourage learning in the children they teach. (Wellington 1985; p17)

The most recent initiative is the National Grid for Learning (NGfL). The provision of technology in schools was comparatively limited until the new National Grid for Learning was introduced. The National Grid for Learning guarantees that not only will all schools be better equipped with new resources and connected to the 'super-highway' free of charge but that many of them will also be on-line. Teachers will be trained and school-leaving children will be Information Technology literate. It might be too wise to accept that ICT is used as a 'label' for what schools deliver either discretely or across the curriculum.

Given McLuhan's (1967) dictum "The way you communicate information changes the perception of the message your audience is receiving", does computer use change pupils' learning styles? Cuthell (1999) discovered that pupils use computers in schools and at home differently. They use different styles of communication and information. They now have access to different kinds of knowledge in an eclectic way he calls 'Bricolage'.

Computers can change the ways in which pupils spend their time in school. There has been a great deal of attention devoted towards teaching pupils how to use programmes such as word processing, spread sheets, databases, graphics, mathematical programmes and computer games. There is also a lot of emphasis placed on the use of e-mail and Internet software on information servers, and the computerisation of library catalogues.

Computers are able to be used for the express purpose of communicating and not just as a tool for calculations, statistic and investigation. Despite that, schools are not resource centres of self-contained knowledge. Does this imply the demise or growth of resource centres like school? Are schools appropriate sites for the new technology?

1.3 Aims of the study:

Following on from the previous discussion, the aims of the study became apparent.

1. To explore the gap between the idea of believing that IT is going to change things and the actual use of IT?
2. To explore the central policy with regard to ICT provision and the ICT resources provided in secondary schools – does practice follow policy?

3. Explore the ways in which secondary school pupils experience ICT as a subject.
4. Explore the ways in which secondary school pupils experience ICT across the curriculum.
5. Analyze the attitudes of these pupils towards ICT in schools and elsewhere.
6. Understand the impact of ICT on pupil 'learning styles' e.g. collaborative working, small group working.
7. The study compares the behaviour and attitudes of the pupils in year 9 and 10 (there is a particular focus on the specific factors that affect these pupils' attitudes.)

1.4 The Need for the Study

Since the end of World War II the electronic computer has been the single most significant technological influence on the way in which we live. The role of computers and Information Technology has grown and expanded to such a point that Information and Technology is prevalent in virtually every aspect of daily life. The Department for Education and Employment (DFEE June 1999) stated that:

“The skill needs of the future will be different from those of today and it is clear that we will not keep pace with the modern economies of our competitors, if we are unable to match today's skills with the challenge of the developing information and communication age of tomorrow. As labour markets change, we must develop a new approach to skills and to enabling people, and business, to succeed” (in Monteith 2000).

One could argue that there is a need to include computer education on the curriculum simply because of its significance in a society which relies so much on the transfer of information and the control of systems. Indeed, the computer has brought with it a major change in the way in which we all operate, paralleling the major changes which occurred

following advances such as the discovery of electricity, the invention of the internal combustion engine, television and radio. Anyone living in the latter half of the twentieth century should know at least something about these technological advances and their uses and misuses. Because computers and computer concepts can augment our thinking it is most desirable for everyone to have some understanding of them. It might be useful to have a brief overview of developments in school over the last 30 years in the context of use IT.

1970s era

For example, the International Federation for Information Processing (IFIP, 1972) wrote that the introduction of computer education is justified by the contribution computers have brought and can bring to education. The arrival of microcomputers in the late 1970s brought personal computer empowerment to individuals. It also brought with it the conviction that all pupils must become computer literate and that schools had the responsibility to prepare their pupils to realise the potential of the empowerment (Collis et al, 1996).

Early – Mid 1980s era

Information Technology (IT) has been the subject of countless conferences, seminars, workshops, and journal articles and newspapers supplements. Much of the attention was first stimulated by the Government's designation of 1982 as Information Technology Year and its financing, in conjunction with private sectors of the community. (Cabinet Office, ITAP, 1983, p.10)

According to IFIP the educational system was supposed to have a profound part to play in equipping the UK population with IT skills. It was expected schools would provide tuition in the use of computer based information systems and that this would grow naturally out of the spread of computers in schools since users will need to make effective use of new technologies in order to maintain their position against competing sources of tuition and information. (ITAP 1983, pp45-46)

Late 1980s

Children acquire the conventions and values of the new 'information age' from their experiences in and out of the school and through the media. They learn about the capabilities, limitations and use of computers as well as of their associated technologies. Information technology has a critical role in enhancing the learning process at all levels and across a broad range of activities including but going beyond the National Curriculum. HMI Series (1989) were suggesting that through the use of 'Information and Communication Technology' in the curriculum, schools will also be helping pupils become knowledgeable about the nature of information, comfortable with the new technology and able to exploit its potential. Indeed, technology seemed to give rise to great interest, and often excitement and pleasure, among young people. New technology has radically changed the home and workplace: it has a similar potential to transform the classroom (p1-2)

There are two overlapping themes that pervade the thesis. One is the way in which IT is used in order to deliver the curriculum. The other is the ways in which pupils learn the skills of ICT.

1990s era

Hawkrige (1991) describes the six major motives of the use of ICT in education thus:

- The social rationale. Computers are important in society, thus pupils should be prepared to deal with them;
- The vocational rationale. Pupils should use computers to prepare for future jobs;
- The pedagogical rationale. Computers can improve instruction in traditional subject areas;
- The catalytic rationale. Computers will set of wide-ranging changes in the educational system itself and change the nature of teaching and learning;
- The IT industry rationale. Supporting computers in schools will help build up a market for country's internal hardware and software production capability;
- The cost effectiveness rationale. Computers can replace teachers or some of the costs of the teachers.

Collis et al (1996) observed that different people from different fields of life such as educational researchers, policy makers, educational decision makers, teachers, parents, teacher educators, learning psychologists, curriculum specialists, and politicians all have their own yardsticks to know about the impact of computers in schools (p.5). What is clear is the political and social will to make changes; what is not clear is whether the changes have taken place.

Since the beginning of the last century the field of education has seen a series of technological innovations but educators, researchers and policy makers still have many

questions to ask. Some suggest we are still in the “dark ages” (Popham 1969; Wager 1993). They claim that the history of educational technology is full of prognostications about how technology will lead us out of the ‘dark ages’ of instruction into the ‘new light’.

Despite this exciting vision of the future, we seem to be left with just that – a vision. More than a decade later we are still waiting for those miraculous interventions predicted by Hawkrige (1991) and others.

21st Century

As Loveless (2001) observes, due to political pressure, digital technology is introduced in education regardless of where or what is being taught. This has tended to produce more of a sense that something should be happening rather than a clear understanding of what that ‘something’ should be.

Use of IT in schools

It is clear that in education IT is used as a catalyst (Underwood and Underwood 1990) to enable the pupils to have access to a world of information and knowledge. There is always a tension between using computers as a medium and learning the skills of using them.

Loveless (2001) goes on to say that

“ICT challenges current descriptions and practice of pedagogy in terms of all prescriptions of time, place, authority and purpose of teaching. Learning and teaching are often are often assumed to ‘take place’ in particular slots of a timetable and particular classrooms associated with particular curriculum subjects. Information and Communication Technology can afford opportunities to extend the connections between learners, teachers, and information beyond the formal ‘school day’ and the

agreed sources of information”. (p.4)

As Alexander (1997) points out, ‘role playing’ is the quickest way for one individual to experience another’s social ‘positioning’ in the fairly safe context of anonymous online discourse by experimenting with different approaches in a safe and secure environment. Bracey (1984); Genishi et al (1985); Johnson (1985); Yawkey (1986) state that several computer programmes have been designed to help the young to develop creativity, cognitive skills, and other basic skills such as reading, writing and mathematics (Collis et al 1996, p.69). Knezek et al (1994) conducted research on the Young Children’s Computer Inventory (YCCI) project and examined the impact of computer use on children in Grade 1 to 4 in schools. The study was cross-cultural between Japan and the United States. The variables studied in this project included computer importance, enjoyment, motivation, study habits, empathy and creative tendencies.

The findings were that:

- Computer use in primary school has a strong impact on attitudes toward computers
- Computer activities can have a positive impact on motivation and study habits over the course of several years.
- Gender differences with respect to attitudes toward computers do not generally exist at the first-grade level; they probably do not emerge until after Grade 3.
- Evidence indicates that creative children may choose to use computers, rather than computer use fostering creative tendencies. (p.19)

That particular study was conducted on primary school children. Previous research has tended to focus more on the programmes provided and less on the feelings and attitudes displayed by the participants.

Many studies have been undertaken on the use of Information Technology in education. Cuban (1986) provided a pessimistic analysis of technology in schools; Bowers (1988) identified the cultural biases of educational computing; Dreyfus (1992) outlined the failure of computer-based instruction to live up to its promises. The U.S Congress (1989) governments and local communities have responded to this concern by providing funds, equipment and other material resources to educational institutions to encourage the practice and use of ICT.

Some studies of the use of computers in schools are limited to matters such as the availability of resources and the programmes used. Other studies have looked at pupils' attitudes. For example Cole (1990) determined the needs and requirements of pupils entering the world of work. In his study he compared the IT skills and competencies of pupils upon entering such a course of study and when leaving the course. He suggested three hierarchical phases in IT education. In the first phase IT is seen as an isolated subject, in the second phase IT skills are integrated by a project approach and in the final phase IT is fully integrated into the normal curriculum. He finally concluded that extra equipment and training for staff was needed to improve the quality of IT. He did not examine the pupils' attitude towards computer studies or how they use and think about computers.

Al-Haile (1994) typically summarizes contemporary approaches to IT in education. He argues that in schools computers can be used in three modes. These are: learning about computers (academic), learning from computers in Computer Assisted Learning or ICT (cross-curriculum) and learning with computers or being able to use computers in ICT (vocational). He concluded that the use of computers can be associated with academic work, rather than pleasure, or used as a tool and as an aid although they can also be used in 'games' playing.

Cuthell (1999) investigated the impact of 'Information and Communication Technology' (ICT) on secondary school pupils. He compared the pupils' ownership of, and access to, computers with that of their teachers. He developed an analytical model for classifying pupils' uses of computers. He examined the pupils' attitudes to computers, together with the impact these have had on learning strategies and expectations. Although he developed an analytical model for classifying pupils' uses of computers, he did not examine how secondary school pupils use computer in school.

Although some research has been done on how ICT is used in schools, and more on how it ought to be used, little research has been done on what pupils think about ICT. Pupils demonstrate general attitudes towards computers, not necessarily linked to school, and they also have strong attitudes towards the experience of school.

Hill et al (1987) noted that there are many signs suggesting that pupils have positive attitudes toward computers. Varied attitudes and beliefs concerning computers are

important to understand for a number of reasons. Foremost among these is the fact that school pupils' willingness to accept computer technology may be affected by the attitudes they hold towards them. Paxton and Turner (1984) suggested that naive users, who had negative attitudes towards computers, learned computer-editing tasks more slowly and made more errors in using the computer than did those who had more positive attitudes.

Longworth (1981) suggested that what children learn at school has a 'useful life' of half a generation. Teachers argued that what pupils were learning in school concerning computer use was not of much benefit outside school because pupils would see different software packages in use than those in school. Developing positive attitudes towards computers may give pupils the courage to learn about different software and hardware systems and adapt themselves to situations needing computer skills. SOED (1991b) noted the capacity of new technology to support learning and teaching across the curriculum through experience of simulations, problem solving, investigating and handling information is considerable. It was argued that it is important that the potential of new technology is exploited to enrich pupils' education (Robertson 2002, BJECT, p.403).

There is less attention paid to the way in which pupils actually use resources (like computing in school and at home) and how they relate to their work as well as their attitudes towards computers. The focus of interest has been on the fascination and attraction of the new technology rather than the context in which it is operating.

1.5 Research Problem

In 1970s and 1980s research has been carried out on 'programming'. The emphasis has been on creating and evaluating packages rather than explaining the pupils' attitudes towards the use of computers. It was the lack of research work done concerning this specific topic that led to the interest in this study.

Barker (1995) notes that computer technology offer many new dimensions for the effective provision of support for teaching and learning. Until recently, the major emphasis has been given to teaching and the creation of more effective and more efficient individualised and group learning systems based on Computer Assisted Learning (CAL), Computer Based Training (CBT) and Computer Mediated Communication (CMC) techniques. The majority of cases have shown that this object has been realised though the development of supportive and/or collaborative learning mechanisms involving various types of interactive technology based-environment.

Donaldson (1978) points out that for many learners a change occurs in their attitudes towards learning as they progress through the educational system. At the beginning, children are intrigued and enthusiastic. They approach learning with enthusiasm, enjoyment and commitment. As the years pass, many of these children appear to lose that 'joy of learning' which characterized their preschool and early school years. For some, education remains an enjoyable experience but for others it can become associated with 'work' not pleasure. The concern of this thesis is in the understanding of computer use in school as a part of the general educational experience. As increasing number of computers

are introduced so will the experience of school change.

The use of computers in some schools is mainly associated with academic work (pupils learn basic principles in order to pass the end of year exams and in some schools they use the computer as a tool for learning. Computers are used like books (or other resources) to help pupils to learn. However, when the computer was first implemented in schools it was seen as an enjoyable experience. One question is whether pupils still associate computers with pleasure or whether they find the initial excitement replaced by more routine familiarity.

Westby (1989) described computer technology as the atomic bomb of the information age, which will break the barrier between learning and entertainment. This combination between learning and entertainment that computers can bring may have an effect on pupils' attitudes toward them.

The thesis will address different modes of computer use in secondary schools. The empirical evidence is sought to explore:

- Pupils' attitudes towards working with computers?
- Pupils' skills in using computers.
- Pupils' everyday interests and experiences in relation to ICT.
- The place of ICT in pupils' experience of school.

This study tries to recognise the impact of the pupils' attitudes towards the use of

computers. As mentioned earlier, few studies have dealt with the pupils' attitude towards the use of computers. Those that have are in the context of gender issues or attitudes towards the use of computers in general, attitudes towards the use of computers at home and different ways that computers are used in schools. There is a marked lack of research on the pupils' experience of using computers and on their attitudes, behaviour and feelings in different environments and situations. The attention has been focused more on the computers themselves and their potential, on the programmes that could enhance learning and on their possibilities, and on the possibilities of distance learning. This study looks at pupils in schools, and their attitudes to computers as part of the school curriculum.

This study will also:

- a) Examine pupils' attitudes towards the use of computers in different contexts;
- b) Consider the relationship between "learning with computers" and "learning about computers".
- c) Explore how attitudes towards school affect the experience of ICT.

The researcher wishes to investigate the reality of how pupils judge the use of ICT and what their perspectives are towards the use of computers.

CHAPTER 2

INFORMATION AND COMMUNICATION

TECHNOLOGY IN EDUCATION:

DEFINITIONS AND CONCEPTUAL BACKGROUND

Chapter 2

Information and Communication Technology in Education: Definitions and Conceptual background.

2.1 Introduction

The increasing use of technologies in education, to deliver instruction and support learning, is significant.

Duncan et al (1978) described 'Educational Technology' as a subject with no clear boundaries. It is area which comprises a highly practical element at the same time as enveloping an element of complex and highly theoretical research. The merging of these two aspects has already been highlighted in some literature to cause severe communication problems, and consequently problems of information transfer. Plomp and Pals (1989) observed that educational technology is growing internationally but European conceptions, for example, from the United Kingdom and the Netherlands, generally follow the North American pattern rather than stem from the tradition of the education culture and structure of each country.

2.2. Three critical roles of educational technology

Karen et al (1998) presents the following three critical roles of educational technology

- Educational technology as an Intangible Asset.
- Educational technology as a tool to create knowledge.
- Educational technology as a lever for other investment.

2.2.1 Educational technology as an Intangible Asset

The ability to use computers in teaching, the development of new courseware, and the method of teacher and learner working together has become part of the intangible knowledge base of educational providers.

2.2.2 Educational technology as a tool to create knowledge

Educational technology helps create knowledge when it is used to invent new educational approaches, to build unique databases such as best practices or best student models, and when, through interactivity, teachers and learners together craft new solutions that can be captured and stored for future teaching and learning.

2.2.3 Educational technology as a lever for other investment

The growing potential of technology is a valuable resource in developing other aspects of the organisation, or a school's knowledge capital. It can create strategies that capture and optimize its impact. Such strategies integrate learning systems closely with other systems that:

- Acquire and transform resources
- Interact with educational partners and
- Create and safeguard competitive advantages.

All of these information-generating activities are recognised as possible sites for knowledge creation and learning. This research explores whether educational technology creates, conducts, manages, and supports teaching and learning.

These definitions are similar to each other in that they each emphasise the primary function of educational technology as improving the efficiency of the process of learning. Significantly, each of the definitions implies a different interpretation of the role of educational technology, involving a cyclical approach to the design of teaching/learning situations and the resulting use of whatever methods and techniques are judged to be appropriate in order to achieve desired objectives.

Glaser (1996) said

“The basis for consistent improvement in educational methods is a systematic translation of the techniques and findings of the experimental science of human learning into the practical development of an instructional technology. To achieve the full benefits inherent in this concept, instructional materials and practices must be designed with careful attention to the attainment of explicitly stated, behaviorally defined educational goals. Programmed learning sequences must be developed through procedure that includes systematic tryout and progressive revision based on the analysis of student behavior”.
(p.3)

Teachers using a combination of theories may be able to improve student learning over the whole range of abilities. This definition introduces two concepts which are of equal importance. First is the concept of instructional technology as applied to learning theory. Second is the idea of product development through the systematic testing and revision of learning materials.

However, the use of different terms such as ‘interaction and ‘learning’ can sometimes be confusing. (During the pilot study interviews the researcher used two different terms

‘information technology’ and ‘information communication technology’. Some of the pupils became confused and they asked the question: are these terms different? What is the difference in IT and ICT?)

In order to understand the meanings and the way people use these terms in practice the researcher decided to make a clear, brief and preliminary examination of these terms. Wellington (1988) suggests the use of the term ‘IT’ (provided one realises that it is at a high level of generality and) will often need to be “translated down” into its concrete components (p.6). Zorkoczy (1982) links the term ‘information technology’ and its components together. ‘Information technology’ is now in common use. It is in fact a relatively recent addition to the English language. Before this the term IT has only been used in the American ERIC (Education Research Information Centre) database since 1986. The term has its counterparts in the French ‘informatique’ and the Russian ‘informatika’. IT is synonymous with ‘the new technology’-the use of microprocessors-based machines: microcomputers, automated equipment, word processors and the like. (p.3)

Different attempts by different researchers have been made to define the components of these at different times. “Information” can be defined as “coded representations of aspects of reality, which are used to model the real world” (FEDA, 1997; p.10). Information is one of those terms which everybody assumes they understand, but the more closely the concept is scrutinized the more elusive it becomes. “A dictionary may define “Information” in terms of 'facts', 'knowledge', or 'experience', and define these terms by referring them to each other, or back to information”(Stonier 1997, p.1). Information is the visible or

audible form into which we transform our knowledge when we need to communicate it to someone else. It is knowledge put into the outside world for use and the way in which other human beings use it to transfer it back into inward knowledge.

Interpretation of term like 'technology' vary with the passage of time. It all depends on the way people use them. Developments in technology produce new environments more rapidly than at any period in our history. These changes need to be understood. What potential impact has technology on the individuals' leanings within modern society?

“Technology, like democracy, includes ideas and practice; it includes myths and various models of reality...and like democracy, technology changes the social and individual relationships between us. It has forced us to examine and redefine our notion of power and of accountability”. (Frankline 1990; p. 12)

Education is not a commodity or a production model. It is a deeper and broader term. As Plomp and Ely (1996) observe the word, “education” is used in a broader sense than merely learning and instruction. Education covers the conscious structuring of experience in order to facilitate learning and instruction, and also the communication and interaction which can lead to learning and instruction. It is not synonymous with, but also includes, higher education, vocational education, professional education, training, and educational environments outside traditional, structured educational institutions. Thus, “computers in education” refers to the use of computers as mediators in the flow of information, communication, and instructional materials that occurs in, or relate to, educational situations. Information technology is an area that is developing at a rate which ensures that any publication is, almost by definition out of date. The new information and

communications technologies have profoundly affected our social structure. There is a growing interdependence between technology, information and society.

- Information technology encompasses a range of ‘new’ technologies and their applications, which are already making a profound impact upon society.
- In Britain, government support has been forthcoming for Information Technology developments in industry through the Department of Industry ‘Support for Innovation’ programmes, which has provided grants and advisory services covering a wide variety of new technologies.
- Information Technology represents a major growth area in education and training.

2.3. Definitions of Information Technology:

Because of its pervasive nature, and because the subject embraces both a technology and widespread applications, definitions of the uses are complex. A number of definitions have been attempted in recent years, with varying degree of success, most referring to the relationship between computer technology, communication technologies and the storage, processing, transmission and retrieval of information.

‘Information technology is concerned with systems for the creation, acquisition, processing, storage, retrieval, selection, transformation, dissemination and use of vocal, pictorial, textual and numerical information. Current systems typically utilize a microelectronics-based combination of computing and telecommunications which may, in turn, act in conjunction with other technologies to multiply their effects’ (CGLI National Advisory Committee for IT, June; 1983). UNESCO: - Information technology is the ‘scientific, technological and engineering disciplines and the management of techniques used in information handling and processing; their applications; computers and their interaction with men and machines, and associated social,

economic and cultural matters'. Ergonomics Unit, University College London: - Information technology is 'the production transformation, storage and transmission by electronic means of information in the form of representations'. (FEU, April, 1983; pp 1-2)

Hoban (1965) described that the part machines play in education, are forced into a consideration of complex systems of people interacting with machines. IT is a complex, integrated organisation of human and machines, of ideas, of producers, and of management.

Wellington (1985) defines

'Information technology' as generally offered as usually something like: the application of technology to the creation, storage, processing and communication of information. (p.203)

He has incorporated his concept into his own pedagogical environment by the use of electronic conferencing areas for each course, computer managed records, videoconferences and conducting teaching and learning activities on line. The National Curriculum Council (1990) notes that Information Technology includes the ability to use computers and electronic equipment to process and communicate information and also use computer simulations to develop an understanding of real and theoretical situations. Students should be able to use word-processors, databases, spreadsheets and other software, as well as electronic communication systems such as electronic mail and teletext.

2.4 Instructional Technology

It has been noted how the introduction of new technology has gone through a typical cycle from hopes and the great belief in the power of the new technology to the displacement by disappointing empirical research. This is well demonstrated by the example of Instructional Radio and Instructional Television. (McAnany 1973; Chu and Schramm 1967; Schramm 1977; Nwaerodu and Rhompson 1987; Githiora 1990; Plomp and Ely 1996)

Following its initial introduction in the 1920s, educational radio expanded over the next three decades. With the advent of television in the 1950, however, the new spotlight was turned on this new technology. This combined the attractions of sound and vision, perceived to be an irresistible recipe to engage the students' attention and reinforce the learning process (i.e. twice as much information received).

People used to think that television would replace traditional learning styles (i.e. teachers and learning at home). Instructional television has proved that it can be an effective medium at all levels of the curriculum, from pre-school through to university, but it has turned out to be an additional rather than a central medium.

In the 1980s and 1990s instructional television underwent several technological developments and it was widely believed that this form of technology would have a significant impact in the realm of education. However, nothing profound happened. Television increased leisure time. Despite the fact that an enormous amount of money and resources have been directed towards the use of television in the classroom, it is essentially

a source of entertainment rather than one of instruction. Students of the Open University have shown how important personal tuitions remain, despite the usages of television.

The period between 1967 and 1972 can be regarded as a period of consolidation. Plomp (1996) stated that this is the period when the term “educational technology” became recognized and widely accepted by the public. The first official endorsement of a field called educational technology may well have been the establishment, in the United Kingdom, of the National Council for Educational Technology in 1969. This followed the report of a committee on audio-visual aids in higher scientific education. The United Kingdom Association for Programmed Learning promptly added “Educational Technology” to its title in 1968, while in the United States, the Department of Audiovisual Instruction (of the National Education Association) changed its name to the Association for Educational Commissions and Technology in 1970. This coincided with the publication of a major report by a commission on Institutional Technology appointed by Congress, and anticipated the creation of a National Center for Educational Technology within the National Institute of Education at Washington. (p.7)

As official recognition grew, the problem of defining educational technology became acute. The National Council for Educational Technology when it first met in October 1967, stated that Educational Technology is the

“Development, application and evaluation of systems, techniques and aids to improve the process of human learning”. (NCET 1973; p.13)

In the report presented by the US Commission on Information Technology the term Educational Technology as a systemic way of designing, implementing and evaluating the total process of learning and teaching in terms of specific objectives, based on research in human learning and communication and employing a combination of human and non-human resources to bring about more effective instruction". (Ellington 1993; P.9)

Tickton 1970 defined Instructional Technology as "the media born of the communications revolution which can be used for instructional purposes alongside the teacher, textbook and blackboard" (pp21-22). It would be fair to argue that this now embraces ICT in all its applications, both as a stand-alone process and one that is complemented by teachers' comments and demonstration within the classroom.

2.5 Interactive technology

Interactivity can be defined as "sustained, two-way communication among two or more persons for the purpose of explaining and challenging perspectives". (Garrison 1993; p. 16)

This is in itself a valid learning path and one that is capable of delivering rewarding results; it demonstrates the active involvement (or not) of the learner or relying simply on the supply of the hardware.

Berge (1999) observed that in an educational learning environment, interactive activities are usually between students and instructors, or among students. He described that the strength of this ongoing interaction with instructors and students distinguishes the learning experiences of independent or one-way learning from group or two-way communication.

He also stated that interactivity was central to the expectations of teachers and learners to the extent that it was a primary goal of the educational process.

Weller (1988) said that a common type of interactivity in computer-mediated learning is one in which the learner actively adapts to the information presented by the technology.

Jiang (1998) noted that students reported higher learning achievement when a course strongly emphasized online interaction. Berge (1999) also concluded that each medium has its own particular interaction characteristics for instructional purposes. From the viewpoint of interactivity, he assumed that the more interactions that occur between learners and instructors, the more learners are able to learn and to develop knowledge through self-discovery and personal insight. If we do not engage our students' interest and make the learning process enjoyable as well as informative, how can they be inspired to achieve?

Both people and machines use information facilities for:

- Input – information must be received.
- Storage – information must be held for processing and future use.
- Processing – to calculate, select and sequence the information.
- Communication – to transfer information either over local or wider areas to where it is requested or required.
- Output - to create a final presentation of information for use.

Some learning technology devices do not contain all of these features. For example, an overhead projector is solely an input and output device. A calculator has inputs, outputs and limited processing capability but only handles numeric information. However, the computer has the capability to handle all forms of information and possesses the complete

range of facilities identified above. It is this capability which is continuously being extended, with continuing falling costs and technological convergence. It is only recently that multimedia (video and sound) and flexible communication have become economic for widespread use, yet already these facilities form part of a consumer standard. The computer can now be regarded as having the capabilities of a vast interactive and dynamic library. (Cowham 1999; p.11)

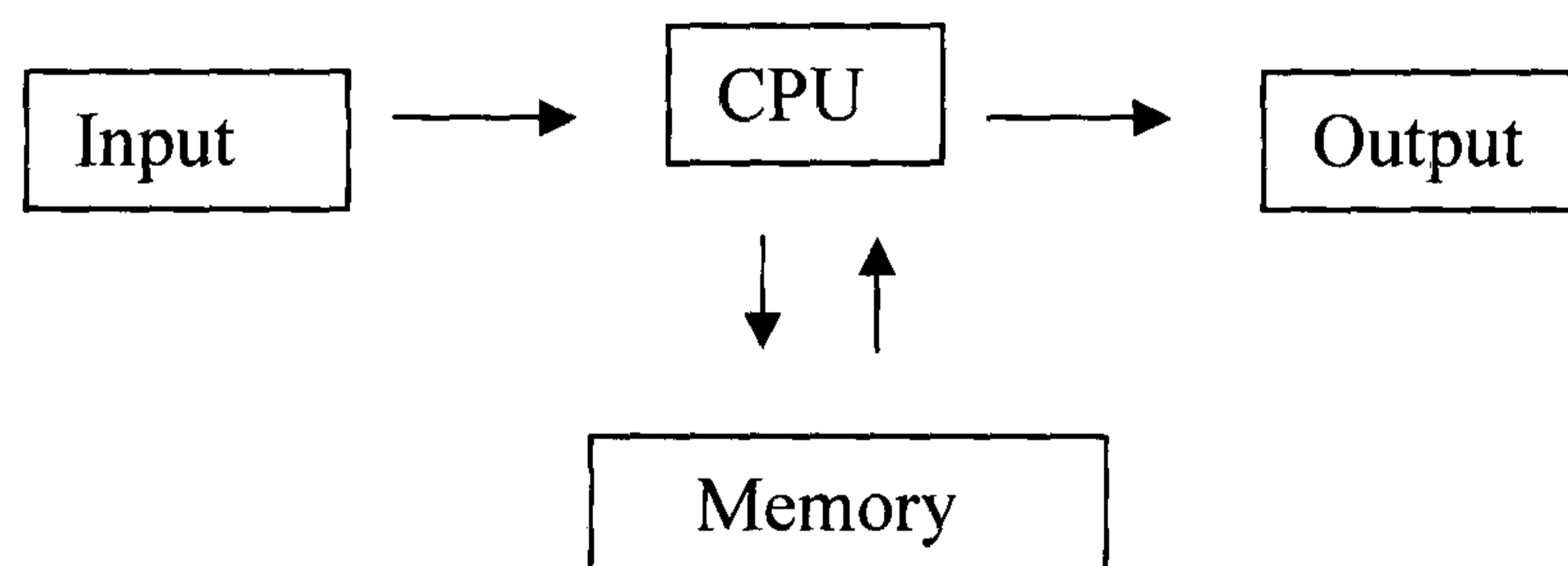
Computers have been used for many years in a variety of applications. They were initially machines devised to perform extensive 'computations' – that is mathematical manipulations, with great speed and accuracy. But a computer can do more than perform high-speed calculations. They can be programmed to draw pictures and compose music. They can store and process large amounts of information easily and quickly or function as a 'personal' tutor in almost any subject area of the school curriculum. One must be careful, however, not to endow some innate intelligence to a computer. A computer must be told exactly what to do, down to the most elementary level and minute detail. (Terry 1984; p. 1)

2.6 Computers in Education

The effective and large-scale use of computers required trained staff to design and support computing systems. "Teachers faced the problems of individualising instruction to meet the particular needs of students; problems of managing students and resources; problems of providing particular learning experiences" (Rushby 1979; p. 12). In the 1960's computers were very expensive and did not have large memory capacities. In the 1960's and 1970's, data processing was mostly undertaken on centralised, large-scale computer systems with

which the users interacted through punched cards or through terminals. The level and quality of the services as well as the cost offered by that system was unsatisfactory.

Plomp (1996) describes that in the data processing environments where large quantities of data are collected and analysed, mainframe systems will not entirely disappear in the future, but the way in which they are used will continue to change. The difference is that the actual processing is done primarily on the microcomputer, with which the user works, whereas in a mainframe system the processing is done centrally. It contains the electronic circuits that interpret and execute (or 'processes) instructions communicated by the user and directs the interaction of the memory and the input and output devices.



(Cohan, T 1984; pp. 1-2)

The major technological break through in what has been heralded as the 'computer revolution', is the development of the microprocessor in which all the processing functions are built into a single silicon chip. Significantly, microprocessors are cheap to build, and that in turn has led to the microcomputer revolution. Computers changed our lives but the microchip has changed computers.

The introduction of microcomputers has brought about significant changes within the field of educational systems. With microcomputer systems we gain access to the kind of resources that previously were available only to large organisations and manageable only by computer experts. The applications of microcomputer systems in educational research ranges from text processing, spreadsheet calculations, graphical designs, text analysis and electronic publishing to data simulation, educational information and expert systems and the management and statistical analysis of complex data structures from large-scale educational surveys with hundreds of variables and millions of observations.

All the above studies and literature shows that since 1920, different technologies and learning aids were introduced in education to maximise the potential of learning. All those innovations could partly fulfill society's expectations or could be said to have partly failed to achieve the required goals. One of the reasons is the teachers often fear to use the new technologies especially computers (Hannafin 1993; Cuban 1986). It is not teachers' fault but the fact that new technologies are invented every day. Another new technology overrides the previous application as soon as teachers come to grips with a new technology (Schramm (1977); Rogers, Peters, and Joung-Im et al (1985); Kay (1990); Hannafin (1993) stated that: "Each technological 'breakthrough' in the past resulted in disappointment followed by disillusionment and eventually abandonment" (p.26). The ideological debates and uncertainties currently surrounding educational information technology can be traced back to the early 1960's. Industrialized nations have, since the early 1960's, sought to adapt the goals, content, and methods of their educational systems so that they can accommodate this new-comer. Around that time a variety of computer professionals and

educators began to meet under the auspices of the International Federation of Information Processing and, in the UK, under the auspices of the British Computer Society (Tagg, 1987). They shared a common aim: to develop the role of the computer in education. Hence, the computer has worked its way into the school curriculum as a training tool, as an instrument in the assessment of students and in educational management.

However, the teaching of computing in schools had, like all other subjects, no particular beginning point. Ideas about computers and computing permeated into school lessons initially mainly by teachers of mathematics and science. As early as 1957 there was a conference at Oxford organised on the relationship between industrial mathematics and mathematics in education. This was the first organised attempt to formally introduce computing techniques into the school setting. (Barker 1971)

Computer enthusiasts have praised the power of these tools and urged the full exploitation of educational capacities to the point of recommending that the entire educational system should be abolished in favour of distance learning by computer technology. It is possible that belief in the role of the computer in education will become even stronger with the forthcoming construction of intelligent, fifth generation computers, which can function as self programming tools, capable of interacting directly with natural spoken and written languages. However, computer use in education requires multiple skills and resources like thoughtful planning, staff education and training, and provision of human, material, and technical resources. In order to accomplish this, we must have clearly worked out plans and procedures. Case and Parsons (1978) pointed that early on. "Adaptation to such a fast

changing culture requires not facts and findings, but procedures and processes, not organisational data but organisational/ skills, not storage but processing”(p.4-5).

Hawkridge et al (1990); Carnoy, Daley and Loop (1987); observed that industrial countries are seeking, through information technology based on computers and electronic communications, to exert greater control over their competitors and over developing countries. And in order to protect their own interests, all countries are being obliged to respond, to a greater or lesser extent, by stepping up their capacity to access and process information.

2.7. Introducing Computer Education in the 1960's

Eileen and O Shea (1987) stated

“It is important to remember that the UK regards itself as the pioneer of modern computing and there is quite a strong widespread feeling that it allowed a world leadership in computer technology to slip out of its grasp in the 1960s” (p.37).

From 1960 until 1964, some schools introduced elements of computing into mathematics classes. This development hastened the process of introducing computer education into schools. However, the rapid prospective increase in the use of computers throughout the UK did not bring any change to the educational system. Tutorial software was developed and used in the late 1960s and early 1970s in a university setting. Information as an object of study then spread from universities to secondary schools.

2.8. Introducing Computer Education in the 1970's

Muffoletto (1994) described the 1970s in terms of

“Academic excellence, raised standards, more homework, and also the ‘year-round schooling shone like a beacon throughout the decade” (p26).

However, with all the work that has been done for the development of computer education, the computer itself was still seen as something that appeared to have little relevance to schools in the early 1970's. This was largely due to the size and price of computers at that time (Kelly 1989; Fraser 1979; BBC 1984; Collis 1996; Martin 1987; CERI 1989; Mohammad Tawalbeh 2001).

In the 1970s, there were few teacher training programmes in the use of computer teaching but there was a great belief that computers would change the world by themselves (DES 1981; Reid 1985; Papert 1993). The early Information Technology initiatives in UK schools were essentially technology centered. The implementation of Information Technology in education, however, involves not only a change of teaching resources but also teaching strategies. It involves pedagogic understanding of what changes the implementation of Information Technology in education brings to both teaching and learning styles. As has been mentioned earlier, a computer is both an aid to enhance knowledge and is also a tool to enhance the teaching and learning process.

2.9. Introducing Computer Education in the 1980s

This period may be described as one of relatively open-ended exploration. In the second half of the decade, by contrast, there was a sharpening of policy goals and a move towards curriculum compulsion. The revolution in microprocessor technology caused educators to make a re-appraisal of what they considered as being “computer education” (Fothergill 1980; Papert 1980; Dean 1982; Pearson 1986; Martin 1987; Sewell 1990; Thorne 1987; Care 1988). A multitude of terms, each connected with both computers and education, acquired new leases of life. Educational computing, computer literacy, computer awareness, computer-aided learning and computer assisted learning were all different names for computer education. The shift from fascination with technology to interest in its use was anticipated by Ellis (1974)

“Thinking about the computer’s role in education does not mean thinking about computers, it means thinking about education” (p.273).

The first major national project in the field of new technology education as previously mentioned was the Microelectronic Education Programme (MEP). The aim of the programme was to help schools prepare children for life in a society in which devices and systems based on microelectronics are commonplace and pervasive. To attain its aims the programme identified three main groups of activities, which it needed to promote curriculum development, teacher training and resource organisation and support (Alvey Report 1982; Williams and Maclean 1985; Megarry 1985; DES 1987; Thorne 1987; CERI 1989; Gledhill 1990; Boyd-Barrett 1990; Stanchev 1996). The development of microcomputers and information technology in UK schools has been a joint enterprise between central and local government as well as sundry other bodies. Without central

government initiatives it would have been very difficult to reach a sufficient consensus of agreed strategies and achieve cooperation in this field.

2.10. Developments in Computer Technologies in Education from the 1990's to the Present

Baker and Sylvia (1998) note that contemporary historians refer to the present era as the information age. Since the 1980s the explosion in the number of micro-computers, software on disks and CDs, cellular telephones, cables, television, fax, voice communication by network computers, multimedia and the growth of the internet system has reflected a period of rapid technological advance. Word processors, databases, spreadsheets, electronic mail across the world, information services, computerisation of library catalogues and the rapid increase in the number of organisations providing information about themselves on the Internet have cumulatively achieved an information revolution. (p.228)

National Council for Educational Technology (NCET) (1997) states that the Internet, widely regarded as a recent phenomenon, actually began its development more than 25 years ago. However, its widespread application has only taken off in the 1990s with the development of the World Wide Web (WWW) which provides point and click facilities for accessing information from anywhere on the world network of computers.

There is probably no single dominant pressure for the use of microcomputers in schools. Politicians, planners, educators, and computer experts (Underwood 1990; Hawkrige,

Jaworski and McMahon 1990) alike find it difficult to keep up to date with computer technology. Oliveira (1988) suggested that the reasons for adopting computers in schools are generally related to four major concerns. These are educational quality, job markets, industrial and technological innovations and social experimentation. The pressures were identified by many (Wilson 1977; Lancaster 1985; Woodhouse 1986; The Commonwealth Secretariat 1987; Underwood 1990; Hawkrige, Jaworski and McMahon 1990; Boyd-Barrett 1990). These pressures can be divided into five separate headings as follows:

- Political Pressure;
- Educational quality;
- Meeting the job market demands;
- Industrial and technological innovations;
- Social experimentation and commercial opportunities.

2.10.1. Political Pressure

Tawalbeh (2001) notes that “education is about politics and government. It is therefore part of the national policies preparing citizens to cope with the complexities of every day life is the duty of educational institutions” (p.134). Politically society is being reconfigured as a conglomerate of corporate leaders, high level administrators and heads of professional organisations” (Hennessy 1993, p.10; DES 1979, para.1; Tetenbaum & Mulkeen 1986; p96; Thomas & Kobayashi 1987, pp.44-45; Micheal 1987; p.165, p.170). Power is no longer influenced by informed knowledge ‘per se’ but rather the controlled access to that knowledge.

Athanasίου (1985) writes about political power in the implementation of technology in education as:

“What should be automated or rather, who should decide? This is not a question about technology, but about political power... we must develop a more coherent and nuanced politics of technology. This politics must be based not on dreams of class reconciliation, but rather on a recognition of the degree to which social antagonisms are mediated by technology”. (in Beynon 1992; p.13)

2.10.2. Educational quality

Suppes (1966) asserted that

“Educational computer usage could change the face of education in a very short space of time”. (cited in Underwood 1994; p.1)

Underwood (1990) states that one of the monitors of educational quality is the degree to which parents see the relevance of taught skill (Linn 1985; Schramm (1981); Woodhouse (1986); O’Shea (1987, p.297). Others (Linn 1985; Schramm (1981); Woodhouse 1986) have supported that there has been a move in UK schools from concentrating on computer literacy towards information literacy and a clear demand in the modern sector of the economy for specialist computer scientists. There is similarly a demand in some economies for some familiarity with, and understanding of information technology by all young people as they enter education. The Society for Research into Higher Education (1996) reported that

“The next generation of student will be increasingly empowered and aware consumers, with a wide choice of educational products...they will be cost conscious, selective aware of the great range of choices, and insistent on high quality. They will expect multimedia and technological sophistication”. (p.34)

2.10.3. Meeting the Job Market Demands

Sassen (1991) has applied the network metaphor to indicate the decentralisation of production and the continued central ownership and control in what is called ‘global cities’ (p27). The question “are computers affecting the job market and requirements imposed upon the education sector” is open for evaluation. (DES 1979 para 2; Raymont 1985; The International Labour Organization 1987; Carnoy et al 1987. Probert, B 1993); illustrates this view;

“Producer services involve significant numbers of high wage professionals and technical employees, but even greater numbers of low wage clerical workers, usually women, and nothing much in between... the increase in low wage jobs and casual employment is linked with the growth of knowledge industries, the growth of high income professional jobs and the resulting gentrification of global cities”. (p.20)

2.10.4. Industrial and Technological Innovations

Economic investment in communications technology, at a national level, is very costly, and governments have both economic and social interest in the technology industry which provides both revenue and jobs. Since technology demands consumers it can be expected that there will be pressure on governments to find customers to use these facilities to recoup the cost of investment. Education has felt this supply led pressure to make effective use of both hardware and software. Historically the first development took place within schools and subsequently incentives such as the university ‘Computers in Teaching Initiatives’ (CTI), ‘The Teaching and Learning Programme’ (TLP), and particularly ‘Enterprise in High Education’ (EHE) were extended to the Higher Education Sector.

There is a common expectation that the use of computer technology can increase the efficiency with which various organizational activities are carried out. This may well be feasible in the context of the administrative work of schools and colleges where the use of microcomputers can be expected to improve the efficiency with which existing tasks are performed. The availability of microcomputers makes the efficiency and effectiveness benefits which are claimed for such techniques more easily obtainable within schools. Countries are spending money on instructional materials, including computers, for reasons not necessarily related to improvements in general learning or to replace teachers or save on manpower costs. These countries have sufficient resources to take the risks associated with innovative programmes.

Computers have been claimed by some to enable educational provision to be made more efficient and by others to make it more effective. Educational computing offers the possibility of achieving progress towards either or both goals. A concern for effectiveness rather than efficiency has been the focus of interest of many educators who claim that the main justification for the use of computers is that they can be used to produce educational experiences which would be difficult or impossible to achieve without their use.

Despite all of the improvements in both hardware and software, the technological infrastructure is not yet totally adequate. Appropriate educational software lags behind hardware, and software is currently still prone to breakdowns and malfunction.

2.10.5. Social Experimentation and Commercial Opportunities

Evans (1981) described very positive attitudes towards the general effects on political and social life of the microelectronic revolution. He thought that the microelectronic revolution would bring an end to wars, poverty, crime and ignorance. This was also seen as a new commercial opportunity for educational software. There are two distinct reasons for this. Firstly, the educational market as a whole is potentially very large and therefore attractive. Secondly, in terms of the future markets manufacturers and suppliers have an interest in future generations of computer users becoming familiar with their make of microcomputer rather than that of another manufacturer. The education system has benefited from the second reason because of the interest of the computer industry in the education sector. (Schiller 1981; O' Shea 1983; p238)

2.11. Conclusion

Information Technology, after painful evolution, firstly as a potential concept and then as a ubiquitous reality, has earned itself a vital place in the forefront of modern education. As society's professional and academic needs become more and more complex we will continue to need appropriate tools of multiple utilizations to address those needs and develop capable and confident citizens of the future.

The computer itself has no bias or prejudice. It is an impartial and faithful servant whose destiny is to serve its master in the search for, and application of, knowledge. Theoretically its boundaries are infinite. There is nowhere in hyperspace forbidden to us. The computer can also can seduce its operator into a myriad of possibilities and attract them back for

more and more visions of purpose time and time again.

Used wisely IT is an instrument for development, not only of the individual but also for humankind as a whole. Used dishonestly it can be a powerful protagonist of propaganda and a catalyst for destruction. It can offer harmless hours of harmless pleasure in on a child's cartoon game or be used to devise an effective and deadly machine for global terrorism and war.

Humankind and technology are now joined in an alliance which has the capacity to take us further than we have ever believed possible in all the years that the human race has walked this earth. In the last century technology advances and society norms have evolved faster and in greater numbers than in our previous history. As our students face computers within their school should they not be feeling inspired and empowered? Karen et al (1998) asserted that computers create, help and enhance teaching and learning strategies. The researcher has determined to find out whether this is the case. The computer has transformed practices of communication and business. The question is what impact has it had on schools.

CHAPTER 3
COMPUTERS' USE IN SCHOOLS

CHAPTER 3

Computers Use in Schools

3.1. Introduction

The demand for computer education grew in the late 1960s and early 1970s with the expansion of the application of computers in industry. This reflected the need to train computer engineers rather than the potential of computers as tools for learning. Mainframe computers were used in colleges and universities as well as industry so it became inevitable for all students to need to have knowledge about the use of computers. It was decided to introduce computers into secondary schools first rather than in primary schools. Most schools acquired computers after the introduction of the 1980 Microelectronic Computer Programme, and some schools started teaching information technology by providing courses in computer awareness.

Lodge (1992) reported that the term “IT” was coined in the late 1970s in recognition of the convergence of three separate technologies. Those technologies were computing, microelectronics and telecommunications. All three technologies played an important role in making the IT revolution possible. With the introduction of each new wave of innovation debates abounded about the effects of new technology on young people. Each new media has brought with it the potential for social and educational benefits and also great concern for children’s exposure to inappropriate and harmful content. Even as this medium is becoming a pervasive presence in the lives of the first generation in history that knows more about a new technology than its parents, the new medium remains comparatively under used by most parents, educators and policy makers.

The belief in the potential to make formal use of computers in education is remains. The UK Prime Minister (1997) in introducing the National Grid for Learning, made the following statement:

“By 2002 all schools will be connected to the superhighway, free of charge; half a million teachers will be trained and our children will be leaving school IT literate, having been able to exploit the best that technology can offer”. (NGfL 1997; p.3)

This statement is a positive message that schools ‘will’ be connected to the superhighway. There is no ‘might be’ in this statement. The assumption is that this ‘superhighway’ will in itself make a huge difference. The Prime Minister therefore equates the idea of exploiting technology with a more skilled, literate and potentially transformed workforce. This kind of assumption is typical of the belief in computers. What is less clear is the actual impact that technology has had on individual learning.

Underwood & Underwood (1990) in their study of computers and learning write that there are a number of assumptions underlying the assertion that computers can be used in education.

- Firstly, that educationalists, parents and society in general would like to see the effective use of new technology in classroom;
- Secondly, that not all classroom use of new technology is beneficial, often because of the paucity of training for new and serving teachers in more fruitful uses of machines;
- Thirdly, that by using the computer as a tool it becomes both an amplifier of human capabilities and a catalyst to intellectual development. (p.vii)

They further explain that as an amplifier, the computer provides an artificial aid to memory and is also a means of producing fast answers to arithmetic questions. And as a

catalyst it provides us with the means producing changes in the quality of thinking in our children. (pp. vii and viii)

The DfEE (1999) states that Information and Communication Technology (ICT) prepares pupils to participate in a rapidly changing world in which global and other activities are increasingly transformed by access to varied and developing technology. Pupils use ICT tools to find, explore, analyse, exchange and present information responsibly, creatively and with discrimination (p.14). New technology, new tools and new applications mean big changes and not everyone can change in the same way. Some people are always looking for new ways to do things in a better and more efficient way. Others fight any change that conflicts in any way with their own values and beliefs. For people to fully embrace change they have to fully accept its value to them on a personal basis. That means that the change has to support the things that really drive them – the core needs and values that determine who they are.

‘Interactive radio’, ‘interactive television’, ‘video on demand’, ‘teleworking’, ‘telematics’ and ‘information’ superhighway’ are now becoming part of everyday usage. But these tools do not necessarily encourage teaching and learning as such. Neither teachers nor learners are fully encouraged to incorporate the new technologies into their teaching or find using them straightforward.

Whilst the DES (1989) stated that: “All pupils should use a range of Information Technology resources in core, foundation and, where relevant, non foundation subjects and cross-curriculum themes...opportunities for using Information Technology within the classroom are many and technological change continues to add to and change them. (p.2)

The word “should” appears to be very strong. The researcher suggests “are advised to” would have been a more appropriate phrase. Educators, employers, parents and other interested parties have increasingly taken the position that provision should be given for the acquisition of basic knowledge and skills in using a computer and the development of positive attitudes towards their productive role in society. It would appear that different teachers perceive the role of computers in different ways. This may depend on their experience, knowledge or enthusiasm for computer education. Many attempts to implement new ways of learning fail because the instructor assumes that all groups are alike and ignores the needs of those most resistant to change (Davies 1981; Papagianis 1987). This research will attempt to classify the different modes (see page 56) of computer use into three main purposes:

- Firstly, to help to understand the way in which computers are used;
- Secondly, since there is a lack of understanding of computer use amongst different people, in order to be able to communicate with one another about the ways in which computers are used, there is a need to be clear which mode is being employed in schools;
- Thirdly, such classification provides a structure for this research. This chapter attempts to produce a framework for examining computer use based on the different classifications described in published work.

3.2. Aims of IT in Schools

In order to have a clearer picture of what IT tries to do in schools, it is necessary to examine the perceived aims of IT. The Department of Education and Science 1989 stated the aims of IT in schools as follows:

1. To enrich and extend learning throughout the curriculum, using technology to support

- collaborative working*, independent study and re-working of initial ideas as well as enabling pupils to work at a more demanding level by obviating routine tasks;
2. To help people acquire *confidence and pleasure* in using IT, become familiar with *everyday applications* and to be able to evaluate the technology's potential and limitations;
 3. To encourage the *flexibility and openness of mind* necessary to adjust to, and take advantage of, *the ever-quickenning* pace of technological change, while being alert to the ethical implications and consequences for individuals and society;
 4. To *harness* the power of technology in helping pupils with *special educational needs* or physical handicaps to increase their independence and develop their interests and abilities;
 5. To help interested pupils undertake detailed study of computing to design IT systems for solving problems. (p.2)

It can be seen from this that in practice use of IT caters theoretically for a wide age and ability range of pupils. The philosophy behind this is that computers are a tool for all pupils to use regardless of age, gender and ability. The emphasis is tellingly not just on the skills involved but attitudes. Writers such as (Apple 1987; Carnoy 1987; Bozber 1989) all highlighted three modes of computer use under the heading of teaching and learning. These were:

- Learning about computers
- Learning from computers
- Learning with computers.

In this chapter the researcher will consider the three modes of learning about, learning

through and learning with computers. The differences between them will be discussed and clarified in detail in the following sections, taking into account the emphasis on the different modes of study in schools.

3.3. Learning about computers (as an educational subject)

Learning about computers may be accomplished through computer studies courses. During the 70's and 80's, computer studies was one of the most rapidly growing subjects in a number of countries in terms of the number of pupils studying it. In schools pupils often chose computer studies as a subject. For example, the UK examination boards have, for some 35-40 years, offered optional computer studies courses as an examination subject at secondary level. The rationale for such courses reflects the fact that vocational courses cannot adequately cater for those pupils who wish to undertake more substantial study in this field.

The Alvey Report (1982) identified an urgent need for an adequate supply, in both quantity and quality, of properly trained graduates to teach computer studies as a school subject...but the number of graduates actually trained to deliver computer studies remained low. Neil Straker (1985) reinforced the point

“In the long term computer studies should become a subject in its own right, taught by specialist teachers”. (p.125)

The same need was reiterated: “Computers and information technology is a subject of study in their own right. This aspect has led to the development of various courses in computer science and information technology, particularly at the vocational and upper secondary level”. (OCED 1989; p.13)

In an ever-widening curriculum it is very difficult to offer pupils sufficient depth in all areas. The response of many schools is therefore to allow an element of choice, or specialisation, at the age of 14 following a common core curriculum.

There is clearly a self-reinforcing relationship between the teaching of computer studies and the use of computer equipment. The teaching of the subject creates a demand for computing equipment, and the provision of equipment facilitates the teaching of the subject. Teaching about computers in schools is not yet clear because schools do not know which mode of computer study they are supposed to be using. In some cases the focus has been on the teaching of the subject to a minority of pupils who will take an externally certified examination in computer studies as a subject alongside the other established subjects in the curriculum. In other cases the emphasis has been on the provision of a computer studies course that does not lead to an external examination. Computer studies courses can be focussed either at the later stages of secondary education or in the earlier years of secondary school. Initially such courses tended to be developed for the senior secondary pupils, but these courses have increasingly been replaced by, or augmented by, courses for pupils at lower levels. However the number of pupils who take an interest in learning computer studies in its own right has turned out to be below the expected demand.

3.3.1. The Aims of computer studies as a subject in its own right

Woodhouse (1984) explained that with the limited computing resources available in each sector of education, the decision should be made whether such resources should be used to give a limited exposure to computing to as many pupils as possible via a computer appreciation programme or whether to utilize the equipment for more advanced study by

a minority. Conversely, the decision to provide a computer appreciation course for as many pupils as possible can imply that developments in computers and other information technologies are likely to be relevant to the future life of a substantial proportion of the population. Some understanding of the capabilities and limitation of computers should therefore form part of a general education for all.

The DES (1989) stated that the aims of computing as a specialist study should be to extend, unify and deepen pupils' understanding of computer technology and its applications. In particular computing should help pupils:

- To study the capabilities and limitations of a broad range of applications;
- To analyse systems and to apply a solution to problems using reasoning, judgement and persistence;
- To study ways in which computer applications affect the operation and management of industrial and commercial concerns or public services;
- To gain some understanding of the working of systems which extend user's mental and physical functions and capabilities;
- To carry out sustained pieces of work that are formally assessed and relating to the application of computer technology in society. (p.37)

Beynon (1992) stated that computer awareness and computer literacy appreciation generally have the same content as computer literacy but at a more basic level; using a keyboard, loading floppy discs, producing an elementary programme, using a package such as spreadsheet and using a printer. (p.126)

Some schools are failing to teach computers because they, in turn, are not very clear

about what they are offering to pupils. Teachers may not be clear whether what they are teaching their pupils Computer Studies (as a subject in its own right) or embedded in other cross curriculum subjects. Indeed, the schools themselves may not be very clear about what it is they should be offering.

Loveless (2001) stated that in UK there is still discussion about whether ‘information technology’ is a subject in its own right, or a description of the tools and resources used to support the teaching and learning of other subjects in the curriculum (ICT)

3.3.2 Sub-Modes of Computer Studies

Since the main mode of learning about computers is computer studies as a subject, there are some limited sub-modes of using computer studies within this type.

The sub-modes of using computers in computer studies are as follows:

Programming;

Problem solving;

Logical thinking.

3.3.2.1 Programming

Nash and Ball (1982) noted that a computer programme is a sequence of separate instructions, written in a programming language, which together may be used as and when required to do what is required, clearly, completely and consistently. Self (1985) stated that programming aids the development of problem-solving skills, especially if, as with LOGO, the language encourages good techniques (i.e. dividing large problems into smaller pieces) and provides an environment in which experimental solutions can be easily tested. This is so, almost irrespective of the particular problem, provided of course,

that it is one which the pupil actually wants to solve. (p.80)

If programming is truly an ideal way of learning to think then all children should be taught to do programming in all of our schools. Nowadays, more emphasis is on the use of Word Processing, spreadsheet programmes in the classroom. CD-ROM, databases and Internet are used less as is clear from the present study (both quantitative and qualitative results). As Wellington (1985) stated:

“How can you justify teaching computer studies to a select few when what is really needed is an introduction to the computer and its uses for all pupils”? (p.5)

Underwood & Underwood (1990) wrote

“Since the first computers were first introduced into classrooms, they have been used mainly for teaching programming languages. There has been a huge growth in these activities, which can now be supported. Some of these activities are still essentially concerned with programming, for there is an active group of educationalists who argue that learning to program is an ideal way of learning to think...programming is a popular classroom activity, for all ages of children”. (p.3)

3.3.2.2. Problem Solving

The first educational programmes designed to reinforce facts have evolved into programmes to help students do problem solving. From this it would appear that ICT skills are only the initial step in proficiency and that improving thinking skills may be the essential goal. Some children may experience difficulties in learning/engaging with problem solving activities. (Shaws 1980; Hawkrige 1983; Noss 1983; Straker 1989; Goldstein 1997; Freedman 1999)

3.4. Learning through computers (Computer Assisted Learning (CAL) across curriculum).

Barker (1989) pointed out that in the 1960s when CAL was first introduced it was not widely accepted at that time because it was regarded as a potential threat to teachers. In the late 1970s, microcomputers were introduced into academic institutions and attitudes towards CAL then changed. Today, educators look upon CAL as a means of producing a new and improved form of education (p.78). Others (Beech 1983, p.3; Hawkrige 1990; Watson 1987; Woodhouse 1986; Maddison 1983) look upon CAL as learning about other subjects through a computer.

3.4.1. Objectives for Computer Assisted Learning (CAL)

As CAL covers such a broad area it is difficult to describe specific learning objectives.

However, Barker and Yeates (1985) describe the objectives of CAL to be the following:

1. Augmenting conventional teaching/training methods;
2. Accelerating the learning process;
3. Experimenting in course development;
4. Providing remedial instruction;
5. Providing individualised instruction;
6. Providing enrichment material;
7. Achieving consistently higher teaching standards;
8. Providing cost effective instruction;
9. Providing 'on-demand' instruction. (p.27)

Barker and Yeats (1985) presented two approaches to the use of computer systems:

1. The computer in itself is not only the *medium of instruction* but is also the subject of instruction. *A computer study* is now an extremely popular part of the curriculum in many centres of learning.
2. The computer acts as one of the many media that are used in the teaching of some other disciplines—such as Mathematics, English, reading, Modern Foreign Languages, Science, History, Geography, Music, Dance, Food Technology and a host of other subjects.

3.4.2. The CAL Development Processor or Sub-Modes of Computer Assisted Learning

At this point it would seem logical to expand further on the theoretical modes which may be encountered in learning and discuss them in more depth. Different writers and researchers have different theories on which modes of CAL may be appropriate and how they are applied. For this reason the researcher decided to examine CAL in more depth.

Gagne (1970) lists the four conditions of learning with computer-based applications as being.

- Intellectual learning,
- Cognitive learning,
- Verbal (and, in the case of computers, visual),
- Motor skills learning.

(In Underwood and Underwood, 1990; p.173)

These four conditions of learning are related to the Chuah et al (1987) modes of learning when they write that CAL refers to the use of computers as ‘teaching tools’. CAL can be designed and developed in order to support many different modes of learning and includes:

- Problem solving
- Drill & practice
- Inquiry
- Simulation
- Games
- Tutorial.

(In Barker and Yeates 1989; p80)

Problem solving has already been discussed in this chapter in detail. Other CAL sub-modes will be discussed in turn.

3.4.2.1. Drill and Practice

Watts (1981) noted that the ‘Drill and Practice’ programmes are probably the easiest way to develop basic concepts and skills. Heinich et al (1989) indicated some areas of the curriculum where the drill and practice sub-mode is used such as Mathematics, Modern Foreign Language translating practice and vocabulary exercises. Educators, researchers, parents and others have different views about Drill and Practice programme. Willis et al (1983) observed that Drill and Practice is perhaps the easiest form of Computer Assisted Instruction (CAI) development and use.

Daniel Chandler (1984); stated that:

“It is easier to produce software which reduces ‘learning’ to a mechanical activity than it is to produce a tool which meets genuine needs”. (p.43)

As with all other types of software, it is for the teacher to determine if technology is the best way to work with the subject being dealt with. Drill and practice in computing was strongly supported in the 1980s. However, it was not found in use in any of the schools. It was considered that pupils mostly used Drill and Practice programmes for spelling mistakes, punctuation and grammar, but (Chandler 1984) the Drill and Practice programme is not the most important techniques in education for students to learn and practice. They need time which they do not usually have during their lessons in schools (Kelly 1981; Wills et al 1983; Eleanor and Criswell 1989).

3.4.2.2. Inquiry

Fraenkeil (1973) described inquiry as the individual identification of relationships, that is seeking how things work, what they are like and how they relate to other things. Merwin (1979) saw inquiry as a process of higher degree instruction between the learner, the teacher, the material, the content and the environment. Jones et al (1979) defined inquiry as a teaching strategy which enables pupils to find answers for themselves. These approaches arguments are congruent when used in an appropriate curriculum setting and delivered by a knowledgeable and sympathetic tutor.

3.4.2.3. Simulation

Just as appreciation of classical music is an acquired taste, information technology needs to be worked at in order to be understood. There has been extensive research into

simulations and computer games, which demonstrate that these can have a positive impact on pupils' commitment to learning, interest, enjoyment, social interaction and pleasure.

Joachim and Wedkind (1982) stated that:

“Within CAL, computer simulation is one of the most important modes of use and simulation means working with the model of a specific system. In the case of computer simulation it is always a mathematical model, which is implemented as an executable programme on a computer”. (p.145)

This is because a high level of interactivity is required to engage and stimulate learners.

Students need to learn by doing – not by memorising. Woodhouse and McDougall (1986) wrote that Computer Based simulation can be used to promote a range of educational goals such as:

1. Motivation for study;
2. Discovery learning;
3. Learning of content;
4. Mastery of skills;
5. Development of concepts;
6. Social interaction. (p.77)

Other writers such as Willis et al (1983); Woodhouse (1986); Eleanor (1989); Heinich (1989); reinforce the idea that simulation fosters new learning. As Criswell (1989) observes “Computer Based Instruction simulations provide advanced practice that would not be available in a classroom” (pp.2-20). The Curriculum Council for Wales (1990) indicated that simulations may be used to study the behaviour of systems which would be difficult, impossible or dangerous to reproduce in the classroom. Despite all these positive comments, computer simulations appeared to be time consuming and not a great

deal of real learning happens as a result. When children start they are unlikely to stop. In schools they are not provided with machines with simulations installed and there is a shortage of time. So how can they realistically use computers for simulation? If the simulation is the source of social interaction in schools why they are not allowed time for computer simulation? At home they have time but not all children can afford to buy these simulation software packages. Computer based simulation elicits a reactive approach rather than proactive response.

3.4.2.4. Games

Lindsley (1982) reflects that games are a type of simulation that require the student to act in a problem solving situation. Games allow for discovery learning; the actual results of a player's own actions teach and strengthen performance. Educators have stated that anyone who uses a computer to do anything that isn't fun should be tried for a felony (In Criswell, 1989; p.20). Others such as (Chandler 1982; Self 1985; Nash 1982) also reported that the interest of students may also be fostered by providing a 'game' structure.

Dowes (2000) found that some children reported that they learnt a range of 'real world' skills from the simulated environments within the games such as driving cars, skiing, playing golf, playing soccer, controlling aircraft, shooting missiles and how to use guns. However but a very small number of children reported that they learnt how to solve problems, developing thinking skills, patience and develop perseverance, memory and imagination. (Monteith 2000; p.72)

3.4.2.5. Tutorials

Tutorial CAL programmes present material to the pupil and continually check the pupil's progress. The computer acts as a patient "tutor" to teach concepts and skills consistent with the pupil's rate of learning. Effective CAL systems provide instruction in a very structured way, rather than simply converting the textbook to electronic media. A good system is capable of presenting material at the pupil's level of ability, and it can analyse the responses of the pupil to determine the rate of progress through the curriculum. Many good systems are capable of keeping detailed records of the pupils who use the system. This more sophisticated development of CAL is called Computer Managed Learning (CML). In CML the teacher would normally be provided with information about each pupil's progress and her/his specific difficulties. Some believe (Tung 1980 and Kow 1982; International Computer Ltd (ICL) 1982; Willis 1983; Weaver 1986) the tutorial programme represents technology's way of providing each student with a individual tutor that is patient and also responsive to students needs.

Nash and Ball (1982) stated that tutorial CAL is when a computer replaces a teacher in helping a student to acquire some substantial piece of learning (p.101). Criswell (1989) argues that Computer Based Instruction (CBI) tutorials for teaching concepts and procedures introduce new material and provide practice. A tutorial encourage students through acquisition and fluency building to mastery. Some tutorials also provide generalisation practice, and some may be used for mastery maintenance (p.124). Willis (1983) saw tutorials as a total substitute for tutors and teachers as if learning were 'passive'.

The academic tutorial programme cannot be learnt without the help of teachers. It is difficult for secondary school pupils because they sometimes do not understand the instructions on a PC screen. When they do understand they still need teachers around them to ask for help when they need it. If students try again and again, on their own, they get bored and tired and may not complete their task. For the most part, when using any tutorial programme they get some prior knowledge or instructions from their teachers before starting.

Many tutorial programmes are, indeed, no more than programmed instruction books presented electronically rather than in printed form. (Willis 1983; p.173)

3.5. Learning with Computers

The third type of computer use in the learning process is learning with computers. Learning with computers usually involves teaching pupils programming such as LOGO, problem solving, logical thinking, modelling, communicating ideas and information, information handling, measurement and control and evaluation of application.

3.5.1. Using computers as a tutor

Taylor (1980) divided the educational roles of computers and the ways pupils learn about computers into three categories-‘Tutor, Tool and Tutee’.

Chandler (1984) stated that

“Computers are presented as offering ‘individualised tuition’ or more incautiously, ‘a personal tutor’”. (p.2)

This hope has not been supported by evidence. Far from extending the new horizons and

benefits of modern technology, students are using the computer to reproduce the performance of existing tools. Using computers as a tutor in IT mode is similar to the way it is used through CAL sub-modes e.g. drill and practice, tutorial and simulation, which were discussed earlier.

3.5.2. Using computers as a 'tool'

‘That’s the reason they are called lessons’, the Gryphon remarked: ‘because they lessen from day to day’. (Lewis Carroll 1865, p.128)

Willis (1983) stated that in most schools, computers were used primarily as tools. They are there because they perform tasks efficiently in the same way as a typewriter, calculator or telephone can perform useful functions (p.27). Underwood & Underwood (1990) note that the debate concerning the most profitable ways in which we can use this costly (and, in some schools, scarce) resource, can simplistically be reduced into that of the computer as ‘teacher’ (the sub-skills tutoring/practice approach) versus the computer as a tool. The most easily identified uses of the computer as a tool are those seen in most extensive operations in the world outside the classroom, namely data processing and word processing. (p.22)

Data processing and word processing are not only in extensive operation outside the classroom. They are also extensively used in the classrooms. What else can they use computers in class for? Children cannot play games on computers in the classroom, and they are also not allowed to go on the Internet in their own time. They just do what they are told to do by their teachers. So the pupils and teachers primarily carry out certain useful tasks by using computers as a tool. Some examples of this type are word-processing, spreadsheets, database, graphics, and desktop publishing.

Bronowski (1973) pointed out that the technological revolutions throughout the ages were all social developments in the use of cultural tools. Technology cannot replace people; rather it is a system of tools devised by people to extend their power (Monteith 2000, p.149). “The microcomputer is a tool of awesome potency which is making it possible for educational practice to take a giant step backwards into the nineteenth century” Chandler (1984, p.1). There have always been those who doubt the application of computers. Despite numerous reports of individual success stories a summary of inspection reports on English Primary Schools revealed ICT to be “the least well thought” of National Curriculum subjects and subject to “substantial underachievement in about two fifths of schools”. (OFSTED 1999)

Harris (1999) states that,

“Computers began to become widespread as resources for learning in schools in the 1980s. Developments in hardware and software have increased their ease of use. IT was designed part of the national Curriculum in 1990 and from September 1998 has been deemed one of the core subjects”. (p.5)

3.5.3. Using computers as a tutee (student)

Kemmis et al (1977) proposed four paradigms for applying computers to education:

1. The instructional paradigm.
2. The revelatory paradigm.
3. The conjectural paradigm.
4. The emancipatory paradigm. (pp.59-63)

The first two paradigms (i.e. Instructional and Revelatory) of Kemmis were discussed in detail in the previous sections under the different headings (Problem Solving and Drill

and Practice). In this section the last two paradigms (the conjectural paradigm, the emancipatory) will be related to the following modes of using computers as a tutee.

- Programming language;
- Problem solving;
- Logical thinking;
- Modelling;
- Communicating ideas and information;
- Information handling;
- Measurement and control and
- Evaluation of applications.

Using a computer for Programming Language, Problem Solving, and Logical Thinking is supposed to increase children's cognitive skills, have been discussed in the previous section. Since the introduction of computers into the education sector, programming has been argued to be an ideal way of learning to think. This has been described by researchers (Papert 1980; Maxwell 1984; Harvey 1987; Straker 1989; Underwood and Underwood 1990; Loveless, 1995).

In this broad view of learning, education is seen by some as the initiation of the learner into social activities or practices. The interactivity of LOGO as a tool of learning is that it provides the user with immediate feedback on individual instructions, thus aiding in the learning process. Loveless (1995) claims that,

“Control technology offers the opportunity for an investigative approach to solving problems and a development in the complexity of giving and modifying instructions. It also offers the chance for children to engage in a process which they can relate to the real world. (Monteith 2000; p.135)

Observation at the present time suggests that our schools do not always provide the opportunities for pupils to use the computers for LOGO or problem solving skills. Most of the computer activities pupils employ in schools are reading, writing, spelling & grammar check, drawing, paint, spreadsheets, etc. There are not the means (i.e. time, resources and especially the pupils' interest) to allow children to use computers independently. Children fear that they might use the machine in the wrong way and might even lose their work if they just touch a wrong key. Both teachers and children also fear that they might break the machine. Both the teacher and the children do not have control of their own learning. Schools are still not providing independent access to resources. How can children be expected to learn all the above-mentioned skills?

3.5.3.1. Modelling

Loveless (1995) states that “modelling encourages the children to create instructions, to control events and see the consequences of their actions in real or imaginary situations” (p.16). National Curriculum (NC) (1990) writes that the importance of modelling skills and also supported the above mentioned writers point of view have been recognised within the attainment target for IT;

“Pupils should be able to use information technology to design, develop, explore and evaluate mode/s of real and imaginary situations. (p.43)

Many others such as the (DES 1989; Webb 1990; Collis et al 1996; Somekh 1997; Davis 1997; Adams DfEE 1999) also support this idea of modelling. As Papert (1980) point out, the most highly publicised modelling environment is the programming language, LOGO.

3.5.3.2. Communicating Ideas and Information

In McLuhan's 'global village' he suggests we are all now 'fully paid up members' of the "now" society with all the synchronous interactions it includes. As information becomes more plentiful and cheap, it is more available to small states, private firms, government activities and "ordinary" citizens (DES 1989; DFEE 1999; O' Neil 2000).

Pupils have the benefits of text handling packages in giving them confidence as writers and allowing them to present their work neatly. Pupils do appreciate the advantages of the use of word-processors and other text manipulating utilities such as planners, dictionaries and spell checkers. They also enjoy being able to enter a text in different sizes, add paragraphs, cut and paste, and organise layout to accommodate illustrations. Pupils explore the possibilities of transmitting data via systems such as electronic mail and videotext but are not very interested in using computers to write and record information.

Loveless (1995) stated that

"Children do not always interact with the word processor as predicted or desired. They can be 'kept busy' with a writing task with fairly low-level demands and not use the potential of the word processor to help them develop their writing skills. (p.26)

The word processor as such does not seem to interest pupils. They engage with this because they have to in order to present their work neatly to their teachers. However all pupils are neither motivated nor feel pleasure and do not find these activities interesting. How then can we inspire our students and provide pleasurable associations for learning? (Collins 1981; Cockcoft 1982; Kelly 1981; Hawkrige 1983; White 1987; Keisler 1992)

Computer-mediated communication such as e-mail might, no doubt, be time saving but children spend a lot of time in finding the relevant information. They can find pages and pages on any topic but much of it is irrelevant information, with difficult language beyond most children's understanding and knowledge. As microcomputers were introduced people speculated about the paperless society, but unfortunately the use of computers as a document preparation tool has actually increased the number of paper documents. The latest mass-market development, the Internet, is likely to change this, even though the tool used seems to encourage on-screen browsing. The problems inherent with screen preparations have not gone away and also the amount of information available is getting more irrelevant. This system of communication and information does not encourage social interaction. The quality of collaborative learning is getting poor, as is obvious from the present research that most pupils like to use computers individually. Pupils do not take an active part in classroom discussion (Science Direct 2001). There is not much interaction between students and teachers, teachers and students, between peer groups or friends if they do not get time to learn from each other and share their ideas and views together. The researcher believes that information is a form of single component collaboration rather than multi component.

Science Direct (2001) stated that

“We enter an information age in which it is said that digital technology will penetrate every aspect of our lives from love letters to education, business transaction to personal communications and there is growing interest in how, and if, children are learning to use these new technologies. (p.2)

There is no doubt that computers can speed up ways of accessing information but they cannot provide complete knowledge about the facts. In fact they do not help the learners to develop their knowledge and the abilities. To develop this ability, children require the

help of a teacher. It is therefore necessary to evaluate the role that the direct teacher-student, student-teacher relationships can have in improving creative and critical abilities, knowledge, information and understanding.

3.5.3.3. Information Handling

Frank (1979) declared that;

“Man is a machine who stores the information he collects and utilises the information to behave in an intelligent way”.
(pp.173-174)

Previous researches (Ross 1984a; DES 1989; Southall 1992; Chandler 1992; Beynon and Mackay, 1992; Loveless 1995) have emphasised the importance of sorting, displaying and interpreting information, emphasised its validity and accuracy and also claimed that pupils will be able to do many things related to information handling. The question is just what the information handling system has given the children. Why it is necessary for them to use computer mediated information handling systems and what skills can they achieve with this system?

Barker (1989) writes that

“The physical interaction which facilitates a non-trivial order of data processing must be as nearly transparent as possible. The pupils’ efforts and energies should be directed to the conceptual or the procedural development (interaction with the data) and not distracted by decisions concerning interaction with the system”. (p.199)

It is clear from what Barker (1989) said that every user has different needs and requirements. Each student learns differently. Some students want to know why things work, others just want to be able to make it work. Some students are uncomfortable with technology and others learn quickly. Computers may make some kind of learning easier

and less painful by externalizing some human skills, but one of the prices we may pay for these external cognitive tools may be the arrested development of our students' internal resources (i.e. we externalize education by handing our young people machines that focus their energies outward, long before they have developed the inner capacities to discipline the power at their service).

3.5.3.4. Measurement and Control

Papert (1993) states that:

“The idea that mathematics is to do with the body has inspired me to use the computer as a medium to allow children to put their bodies back into mathematics” (In Monteith 2000; p.127).

The founding principle of Papert's belief is that it would be a much more effective environment for learning if it was the children programming the computers. (DES 1989; Niki Davis et. al 1997; Monteith 2000).

Papert suggesting that the question remains as to how the pupils use the computers? They may not get the chance to enjoy the experience of control, which brings together knowledge and skills from a variety of subjects, particularly mathematics, science and technology. There is no doubt that used alongside conventional techniques of measurement and recording, IT can allow pupils to take rapid, accurate and multiple readings of physical and environmental quantities and of rapid processes. For example, secondary pupils are able to make use of measurements in geography or measure distances between two places in mathematics by using computers linked to external probes.

3.5.3.5. Evaluation of Application

Philips and Pierson (1997) and Loveless (1995) note that the use of software can affect the learners' learning process positively and the use of the software can also improve the learners' enjoyment, motivation and commitment to work. It can additionally support the individual's learning by offering their own routes through the material. Software can make difficult ideas more understandable. Philips and Pierson (1997) and Loveless (1995) did not ask if schools provide the opportunity for pupils to use these software programmes. Did not resolve the question that are pupils really interested in learning about software? If pupils are not interested how can we help pupils to take an interest in using these software programmes? How can we build the students' confidence and involve them in using these applications? How can these applications affect their work and their attitude towards their work?

This can be the best demonstrated in the "jigsaw technique". Perkins (2001) described that helps students create their own learning. Teachers encourage students in groups and each group member is assigned a different piece of information. Group members then join with members of other groups who are assigned the same piece of information and research and share ideas about the information. Eventually students return to their original groups to try to "piece together" a clear picture of the topic at hand.

The last five IT sub-modes mentioned above are purely illustrative and are used as a guidance for the integration of IT into the various subjects in the school curriculum but, in practice, schools can not offer all these modes of teaching ICT. As discussed previously the use of these application, may enable pupils to use the different software

packages confidently and effectively. Not all pupils in schools are able to select software appropriate for a particular task or application.

3.6. Conclusion

This chapter discussed three modes and sub-modes for using computers in schools, each of which have been illustrated (i.e learning about computers, learning from computers, learning with computers)

The question that is raised is whether all three modes are used in schools? If ‘yes’ then which of these modes for using computers in school is the ‘best’? If all are not used then which of these three modes is the one most used in schools? What should students learn from them?

Despite many developments over the last few decades, in the potential use of computers in education, schools have been relatively slow in realising that potential (Bleach 1986; Durndell et al 1987; HMI Series 1988; Watson 1993; S.I. Robert et al 1996; Gough et al 1981; O’ Shea & Self 1983; Barker 1989). Although there has been anecdotal evidence of benefit to pupils there has been little in the way of conclusive evidence to support these claims. ICT certainly has the potential to enhance the education sector. Although the innovative use of ICT in teaching/learning can stimulate a dynamic learning environment, the overall effectiveness of any ICT based innovation relies on its successful integration into existing educational activities.

Teachers are the important figures for the cognitive, emotional and social development of their pupils in ICT-related teaching/learning. This point of view is supported by

Bronowski (1973); Monteith (2000) and Chandler (1984). However, new models in the use of ICT are changing teachers' roles. Implementation of ICT activities is now not only changing both the distribution of roles and responsibilities but also classroom dynamics. If too few teachers are involved in the implementation stage and there is no whole school involvement in the evaluation stage, the sustainability of ICT led learning activities can never be truly successful in any meaningful sense. Other factors which may contribute in a negative way include the heavy workloads of teaching staff, the lack of capable staff who are already well versed in ICT, poor budgets and resources, out of date equipment and lack of interest (staff & pupils alike).

Emphasis must be placed on the pedagogy behind the use of ICT for learning and both teachers and pupils should be encouraged to play an active role in teaching/learning activities. At the extreme end of opinion there have been claims that ICT could "wreck" schools. The American scientist Papert once said that putting a computer into a school is like "putting a jet engine on a stagecoach – you gain a temporary increase in speed, but then the whole thing is wrecked!" (Times Educational Supplement, March 24, 2000).

There does need to be awareness that there are a number of potentially negative aspects to the use of ICT in schools. We shall examine these possibilities later. Computers, and their various uses, depend on individual interactions. The question remains whether schools, in their collective activities, can accommodate such practices.

CHAPTER 4

PUPILS' ATTITUDES TOWARDS

THE USE OF COMPUTERS

Chapter 4

Pupils' attitudes towards the use of computers

4.1. Introduction

In the previous chapter the three most common modes of using computers were discussed. In this chapter a critical look is taken at the ways in which pupils learn about/with computers in school, focusing on their attitudes towards the use of computers, their feelings, behaviour, the development of computer skills (if they have any) and what schools are doing to help them learn with computers. From the previous chapters it may be concluded that previous research into the different applications of electronic learning appear to contradict each other, both in methods and conclusions, depending on the personal values and beliefs of the researcher and the driven outcomes to which they may demonstrate allegiance (i.e. empirical evidence being evaluated according to prevailing theories and/or objectives).

In previous research (Yong and Tan 1988a; Barker 1989; Hackbarth 1996b) great emphasis has been given to the individualised, group, supportive or collaborative learning system based on the use of Computer Assisted Learning (CAL) and the use of computers in education and training. Schools need to make the computer learning process motivating and interesting if they wish pupils to learn about them. In this chapter the researcher will write briefly about what provisions schools are making for helping pupils learn about computers more effectively and efficiently and whether they learn at home rather than school. Such factors such as achievement, motivation, gender, interest, self-concept, peer relationship, belief, values will be directly or

indirectly related to learning and attitude.

Pupils' attitudes towards working with computers are influenced and shaped by many different factors. The perceptions and influence of social groups (i.e. friends) appears to play a major part in determining and reinforcing beliefs and may influence future learning activities. In addition, individual learning styles will also have a part to play. An enthusiastic and popular teacher who promotes such activities as both beneficial and enjoyable will encourage pupils to share these beliefs. Conversely, a computer in itself cannot view such student activities in a positive or negative light and is unable to convey a palatable message to the pupils due to their lack of interest. An important factor to emerge from the study of the pupils' lack of interest in computers was the widespread lack of resources, both of time and equipment, available to pupils. Pupils with access to computers at home may be expected to show comparatively more interest, as they are perceived to have both the time and facility to explore such interests at their own leisure. However, this is not always the case.

For those pupils without home access the problem is compounded by long waits, (up to one week in many cases), between lessons and time available to them when they do have access. The waiting periods between lessons often mean that pupils have already started to forget what they have already learned and this may lead to feelings of frustration and resentment. It is noted that for many pupils the school served as a natural forum in which the social dynamics between groups could flourish and develop. Learning activities of all kinds, not just those centered around ICT, appeared to "take a back seat" to social activities within the classroom.

There are many factors that influence learning. Is learning a relatively stable change in knowledge or skills as a result of experience, or can it be given a wider meaning? Learning is a basic human need and shapes our lives. There are many different learning objectives for pupils but as to how successfully these are achieved, or indeed to what extent they are attainable at all remains to be seen.

Saljo, (1999) said

“A fundamental assumption in a socio-cultural understanding of human learning is precisely this: learning is always learning to do something with cultural tools (be they intellectual and /or theoretical). This has the important implication that when understanding learning we have to consider that the unit that we are studying is people in action using tools of some kind”.
(In Science Direct 2001; p.4)

In addition, we assume varying degrees of knowledge as to how to use these tools. Every theorist, educationist, teacher, parent and policy maker has their own ideas on how children learn.

Howe (1975) noted

“Learning involves more than facts - it involves the learning of techniques, processes or skills”. (p.295)

Learning can be active and intelligent by doing some sort of activity and by so doing bring ideas, attitudes, abilities and skills to the learning situation. Learning can be an active process, which gives the learner knowledge and understanding, and which also provides learning experiences. Learners can get opportunities to test, refine and consolidate their understanding in new learning (Clark 1984; Woodhouse 1986; Underwood and Underwood 1990 and West Glamorgan Centre for Computer Education 1990).

The question remains whether computers can change human disposition or increase their capability. They might be merely tools and not really very helpful for effective learning. Learning is possible without computers, but nothing is possible without teachers and pupils. Learning can vary from time to time and from subject to subject. Sometimes learners are active and sometimes passive. Both these types of learning are vital for any subject and especially for the use of computers.

Pupils learn in a variety of ways e.g. they can learn by interaction with a person or an object (It is not necessary that pupils' interaction with computers is effective all the time). The researcher argues that not all the ways of using computers can be more beneficial in assisting pupils to learn than other sources such as teachers. A special emphasis will be given to the arguments made by previous researchers that the use of computers assists active learning (Evans 1986; Woodhouse 1986; Bentley and Watts 1989).

The fact is that computers cannot make learning interactive all the time whether children work on them individually, in pairs, or in small or large groups. Few consequences are outwardly visible but computers cannot really interrogate or assess children frequently. What the pupil knows at each step cannot be determined all the time. Therefore the learning modes cannot be adopted without any conscious realization on the part of pupils.

It could perhaps be concluded from previous literature that for learning to be effective a learner needs the following.

- A non-threatening learning environment for active learning to take place in which they can propose and test out ideas which needs to be supportive, while still giving an evaluation of their efforts.

- Involvement in the organisation of the learning process which could maximize the possibilities for pupils' active learning. With computers neither teachers nor pupils can organise their own time to assist their normal or extension work because pupils are rarely allowed to use the computers freely in their own time. On average pupils only get 1.93 hours of time each to use the computers in schools.
- Learners should be provided with the opportunity to take decisions about the content of their own learning.
- Direct skill teaching provides opportunities to participate in group work in addition to some cooperation and negotiation of direct skills.
- It is true that the continuous assessment and evaluation of the learner's progress allows learners to diagnose their strengths and weaknesses and take more steps to build on or correct them.
- The learning process need to be set within the context of everyday life if understanding of the concept is likely to be understood for long.

Webb (1990) describes any type of information that is “delivered” by the teacher or by books, where the learner is just an absorber of that information, or in other words “a spectator” of that information as a ‘passive’ model. An active mode of learning requires the learner to be mentally involved and develop an understanding of an idea or concept by forming mental representations of them and by being able to use those ideas in new or different situations. For example, a large amount of human learning is achieved through observing another person making the responses, or maybe through reading about it, or through viewing pictures of it or trying to imitate the response.

4.2. Critical views about the ways in which computers help the pupils to learn

There are a number of ways that are thought to indicate that computers can help or assist pupils' learning. For example, the Drill and Practice exercises cannot always help to reinforce previously learned concepts and give practice at answering questions. Although a computer can offer an immediate reward for the correct answer for a mathematical or numerical problem (i.e. flashing points, stars, playing a tune or some other stimulus) it cannot offer a remedial solution of the problem if the answer is incorrect. The children can have one to one access and interactions with computers if they know how to use the computers properly. However if they do not know how to perform a task then how can they learn without the help of a teacher? Teachers and pupils, not the computers, are the main factors behind all this rhetoric. Computers cannot always sort information quickly as well as performing arithmetical calculations and displaying results in a form which is easy to read and interpret. They cannot always offer pupils a much richer context in which to try things out and see what happens.

Tutorial programmes give the pupil some information (e.g. how to balance chemical equations) and then ask the pupils to try out some examples. Tutorial CAL programmes present material to the pupil and continually check the pupil's progress. The computer acts as a patient "tutor" to teach concepts and skills consistent with the pupil's rate of learning. With this, the pupil can get new information and internalise that information but is not able to check out their own understanding by trying out the new skills in a variety of situations. For effective learning the student-teacher interaction is crucial. Pupils can discuss their problems with their friends, classmates and their teachers. When they use any tutorial programme they try to follow the questions asked by the computer. The computer cannot talk to them, even if there is ostensible interaction between pupil and

computer.

Many researchers have used variants on Piaget's (1987) original procedure to attempt to demonstrate some understanding of 'conservation' at ages younger than children typically past the Piagetian Paradigm. These efforts have met with some success if the transformation is brought about accidentally (McGarrigle and Donaldson, 1975). In Piaget's studies one factor was not accounted for. He failed to distinguish between more difficult and more simplified tasks within an area of cognition development. If a conservation task is simple, it may be performed correctly, but if is more complex the child may still make the pre-operational mistakes. In addition, different children will progress through these stages at different speeds, the ages given being rough approximations.

Although working within a broadly Piagetian framework, Donaldson is highly critical of some of Piaget's assertions and offers alternative explanations for many of his findings. She believes that he underestimated the thinking powers of children, partly because he believed that abstract thinking is superior and that it is only attained in late adolescence. Her own work considers the social context in which the child learns and also the child's understanding of that context (Donaldson 1978).

The researcher believes that computers cannot in themselves make the learning environment pleasurable and cannot enrich and enhance the learning process. Pupils cannot get wider and more relevant information from the computer. Additionally, computer programmes cannot generate productive thinking and collaboration amongst pupils, teachers and computers themselves under the right conditions. This is totally

dependent on the pupils and teacher's willingness to use and spend the time in setting up, monitoring and evaluating the learning process.

However, the way that a microcomputer is used in the classroom depends on several factors including the habits and preferences of the teacher, the nature of the room itself, the ethos and traditions of the school and the facilities. Hawkins and Sheingold (1982) observed four aspects of the organization of learning that appear to be affected by the incorporation of computers into classrooms: the curriculum, the learning interactions, the management of classrooms and the monitoring and assessment of pupils' progress.

A computer does not necessarily have the capacity to simulate learning processes and help the pupil learn a fact or matters of "how" and "why" (Garland 1982; Maddison 1982; Chambers and Sprecher 1983; Riedesel and Clements 1985; Clark 1986; Barker 1989).

Pupils need to believe that learning is their responsibility and that success will be determined on their own efforts. They need to believe that even when things look difficult they can work things out for themselves and that effort will be rewarded by success. Simulation programmes cannot always help pupils to develop their learning skills although they can help them to reason things out by guiding them through the arguments that give the acceptable answer. Some people would say that some examples of this type of programme could help pupils to develop through the Piagetian stages of development. The main features of this theory are thoughts and ideas of space, quantity and causality from infancy to adolescence.

Electronic learning is a complex process that relies on the willingness of the learners to adopt a collaborative learning style. This appears to require a major shift in learning behaviour and is a process in which educators appear to have little influence (Moursund 1995).

Research describes the advantages of using computers in different ways. Much of it ignores the main factor the pupils. Children's attitudes relating to the interest and enjoyment associated with computers and school seem to be less positive than hoped. The ethos and traditions of the schools have failed to provide and incorporate the pupils' preferences of using computers in to classroom Fish and Feldmann (1990). They are mostly interested in playing games and going on the Internet and e-mail, which their teachers do not allow them to do in schools (Suppes 1990; Watson et al 1993).

4.3. Definition of the attitudes

Before describing pupils' attitudes towards the use of computers and schools, there will be a summary about attitudes in general. It is important to consider attitudes because we all have attitudes and opinions (though it is not a factor we are born with, but it develops in us from our surroundings where we learn). There is a long tradition of research into people's attitudes dating back to 1901 when Baldwin and to 1918 when Thomas and Znaniecki were among the pioneers of attitude testing. The importance of attitudes in social psychology has led to a substantial investment of efforts to develop accurate means of measuring attitudes. Between the two World Wars, the attention of attitude researchers was directed primarily towards two important issues:

- The definition of attitudes, and
- Attitude measurement.

Allport (1924); Chave (1928); Thurstone (1929) Likert (1932); Kohler (1929); Bogardus (1931); Murphy (1931); Skinner (1957); and Tenenbaum (1944) provided important evidence in this respect. Allport (1935) had pointed out that attitudes were being measured more successfully than they were being defined. Additionally, there were studies made into the relationship of attitudes to such social variables as formal schooling, age and sex.

4.4 Pupils' Attitude to Computers

In recent studies several influences which impinge upon attitudes relating to computers, have been studied. These have included the learner's own characteristics and such background factors as sex, age, school achievement and personality. These also include the teacher, classroom climate, curriculum, materials and instructional strategies. The pupil's personality and achievement may influence a learner's attitude, which in turn may partially influence instructional strategies. Pupils' motivational consequences, their enjoyment, pleasure and interest in the use of computers in schools and at home plays an important role in influencing student attitudes generally

In our delight, bewilderment or frustration with new technology (the microcomputer) it is easy to ignore the pupils themselves and their attitudes and views about computers (as in previous research). A major reason for pupils being ignored is the supposition that pupils will learn something while working on computers no matter what they are doing. The researcher raised several questions which we need to ask ourselves. What do they know about computers? How much do they know about computers? Do they want to learn about them? Do they have favourable attitudes? How are these attitudes formed? How might we use computers in ways that are likely to result in favourable attitudes?

Most studies that have been carried out into an examination of pupil attitudes toward computers have sought out the positive attitudes towards this technology. For example, Mullan (1982) showed that children's reaction to computers is favourable. All the children in the study indicated that they thought the microcomputer helped them to learn. Mullan believed that this was due to the fact that computers provide an atmosphere where cooperative interaction between children is encouraged. The researcher believes that interest in using computers in previous studies may be related to the perceived level of individual attention. Pupils can find using computers very interesting if they get the impression that they will receive individual attention and also by introducing new practices into education.

Cockcroft (1982) reported that it is important in this respect to mention the perceived link between computing and mathematics. There are several pieces of research evidence to suggest that boys show a greater liking for mathematics than girls (Welsh Education Office 1983; Light 1987). The manner in which computers have been introduced into most schools has tended to link computing with mathematics. Other studies in investigating children's attitudes relating to the interest and enjoyment across the genders and subject type groups associated with using computers carried out by different researchers (Kiesler 1983; Fletcher 1985; Culley 1988; Department of Education and Science 1989; Curriculum Council for Wales (CCW) 1990; James 1992).

The debate surrounding the use of computers is relatively clear. The use of computers is supposed to have developed positive attitudes towards computers. The implementation of IT in schools is supposed to be successful. The ambition is that the use of computers could replace previous teaching methods and even teachers.

The researcher believes that attitudes and feelings of a learner towards what is learnt often determine how effectively learning occurs. Many factors shape a pupil's attitudes and feeling and a positive attitude can be an important factor in learning when an instructor's style matches a student's learning style, that student typically experiences greater satisfaction and a more positive attitude toward learning. Existing literature (DES 1989; CCW 1990) suggests no large or significant differences in cognitive ability between male and female, though there is an increase amount of research regarding cognitive processes.

Cully (1986) amongst others has found that ale pupils will often dominate discussions, harass and tease and monopolise teacher attention (both positive and negative). There can often be different expectations of boys and girls both within the classroom and at home

4.5. Pupils' Attitude towards schools

The most common motive for technology-supported innovation in education is enhanced student learning. With the advent of interactive multimedia (i.e. sound, animation and video) there has been no shortage of ambitious claims about technology helping pupils to learn. An improvement in student learning is reported in some studies such as (Wheelock 1983; Boal 1995; Alexander and McKenzie 1998; Valentine and Holloway 2001; Hutchby and Moran-Ellis 2001).

With increasing pressure from parents, pupils, and employers to provide school leavers with 'computer skills' for a perceived better employability, many schools went for computer studies despite the best endeavours of Micro Electronic Programming and LEAs to develop the information technology curriculum for providing equal

opportunities for all pupils. The use of computers in schools continued because it was thought that a computer on its own is enough to give pupils appropriate skills. It is apparent that if ICT is to bear the educational fruit for which computer studies had sown the seeds, then the growth of the subject would have to be directed to making it at least as acceptable for all pupils at different levels and at all abilities.

No obvious change has been seen in schools. Computers are being used for many purposes such as drill and practice, simulations, learning new material, as a tool, as an aspect, as a medium and to enhance learning, but there are still not fully integrated into education (Gough et al 1981; Weller 1988; Educational Technology 1988; Yong and Tan 1988a; Philip Barker 1989; Plomp 1996).

It is not enough for the teachers and policy makers to recognise the importance of ICT and for all schools to have more machines, equipment, more hardware and software just to put their name in the list of technologically rich schools. In reality we need to bring about changes in the way that pupils are using computers to learn, in their attitudes and behaviour. We need to realise that computers are an integral part of the infrastructure of school and for pupils' experiences in school as well. We need to motivate pupils and also help them to learn in interesting ways (Plomp 1996; Pelgrum 1996; Hutchby and Moran-Ellis 2001). It is evident that most work is done on the development of computer hardware, software, modes, factors of computers use in schools and the effectiveness of using computers. Communicating and handling information; designing developing, exploring and evaluating models of real or imaginary situations, measuring and controlling physical variables and movement, will not in themselves bring about a real difference in pupils' attitudes.

If we really want children to be computer literate, computer studies courses should not be only for a minority of the pupils. Computer Studies should be compulsory for all children in all schools and we need to make them more valuable and interesting in order to engage pupils in their computer studies. Developing pupils' ICT capability will not help them to acquire:

- Knowledge about the nature and variety of ICT equipment and software tools;
- Skill in the use of ICT for a variety of tasks;
- Critical awareness of the effects of ICT on individuals and societies;
- A range of positive personal qualities and attitudes.

4.6. Conclusions

The most important condition for the development and use of computers in education is the pupils' willingness to learn about computers and the availability of sufficient hardware and software. The negative attitudes of pupils towards computers already exist.

We will try to make pupils' attitudes more positive. Courses in programming and computer applications of various kinds are supposed to encourage pupils to develop a positive attitude. Software remains expensive, but the continuing drop in hardware costs does mean that schools now have available economic solutions to teaching and learning with computers (Bork 1985; Hameyer 1989; Barker 1989; OFSTED 1996; Freedman 1999).

The whole process of using computers in schools needs careful understanding and evaluation in an attempt to maximize their benefits in using them in the school context and developing pupils' positive attitude towards computers.

The effective rationales of the computers' use are mentioned in Toffler (1974);

Hawkrige, Jaworski and Mc Mahon (1990). This theoretical awareness about the use of the computers could encourage the teachers and pupils to accept the importance of computer use in schools to make the use of ICT fulfill the promises that were made on its introduction in schools. (O' Shea and Self 1983; Criswell 1989; DES 1989)

ICT in the classroom can deliver:

- Social interaction and communication between two or more pupils working together.
- The opportunity for pupils to work at their own pace.
- The opportunity to work with a non-judgmental assessor and thereby allow pupils to gain control of their own learning.
- Instant feedback to pupils' responses.
- A safe environment to work.

ICT has enormous potential to reduce learning difficulties and compensate for disabilities. It can be used to integrate the pupils into the school and inform them. The question is whether this potential is being realized. It might be that in many instances it is creating a greater divide between pupil and teacher/pupil interactions instead. Computers provide a quite different style of information gathering and learning than the usual habits of the classroom.

CHAPTER 5
METHODOLOGY

Chapter 5

Methodology

5.1. Introduction and pen portrait of schools

The pivotal aim of the study is to investigate secondary school pupils' attitudes towards the use of computers in school. The schools for which the sample is taken include the following:

School (E) is a mixed secondary school with a sixth form. It has grown steadily over recent years and has more applications for places than it can accommodate. There are now approximately 1260 pupils and students on roll, making it larger than most schools. The school serves a small town in West Yorkshire. A significant, but decreasing, number of more able pupils from the area go on to one of the three local grammar schools after their primary education. As a result, the overall attainment on entry to the high school has been below average in recent years. However, the school's reputation has grown over the years and this 'leakage' has reduced with the result that the current Year 7 pupils show the wide range of attainment found in many comprehensive schools, although not as many have reached the higher levels of achievement. The sixth form is housed in a separate building nearly a mile away from the main school. About half of the pupils leaving Year 11 stay on to become students in the sixth form and they are joined by about 10 per cent from other schools. Overall, attainment on entry to the sixth form, as indicated by GCSE performance, is lower than in most schools. In the main school, the proportion of pupils with special educational needs is lower than in most schools, although the proportion with statements is about average. The school also has a special

unit for pupils from the surrounding area who have visual impairment. The school has been awarded Business and Enterprise status and this has had a significant impact on the way it works. It has also received School Achievement Awards, School. Curriculum Awards and Investors in People status.

School (N) is much smaller than the average sized secondary school, with approximately 490 pupils on roll. The pupils' attainment on entry to the school is below average. Thirty five per cent of the pupils have been identified by the school as having special educational needs, which is well above the national average. The proportion of pupils speaking English as an additional language is very high. Approximately 50 per cent of the pupils are entitled to free school meals, which is well above the national average. The school has had difficulties in recruiting key members of staff.

School (M) is a secondary school for approximately 860 boys and girls aged 11 to 16 years, most of whom come from the locality of the south west of the town. Some pupils come from further away because the school has a strong reputation for supporting pupils with special educational needs. Pupils with special educational needs, of whom a third have statements of special need, make up an above average fifth of the roll. Specialised provision supports 25 pupils with hearing impairment and 21 with physical impairment. Other special educational needs supported by the school are mainly dyslexia, moderate learning difficulties, social and behavioural disorders, and autism and dyspraxia. About two thirds of pupils have a white British heritage and

most others come from a mainly mixed white Caribbean or Pakistani background. Significant minorities include pupils from white, mixed Asian, Indian and Bangladeshi, and Caribbean backgrounds. Very small numbers come from other backgrounds. About a sixth of pupils in the school speak English as an Additional Language, which is higher than in most schools. Of these, 28 who are at the early stages of learning English are supported by a specialist co-ordinator and a bilingual teaching assistant. The main languages other than English in the school are Urdu, Punjabi, and Hindi. Pupils' attainment on entry is below average, with a very clear minority whose literacy and social skills are well below average. By Year 11, almost a fifth of pupils have left or joined the school other than at the times of normal transfer. The school is a Specialist Sports College of long standing and the community makes extensive use of its sports facilities. The school was re-awarded Investors in People status in 2004, the Artsmark in 2003, a School Achievement Award in 2002, and the Sportsmark in 2002. Many pupils take part in the Duke of Edinburgh Award scheme.

School (L) is secondary school for 11-16 year olds has 760 pupils on roll. The overall attainment of pupils on entry to the school at age 11 varies very widely: it has been much lower overall than the national average in most years, but is rising. The proportion of pupils with statements of special educational need (SEN) is about double the national average. About one third of pupils come from families of ethnic minority heritage, but only a handful are at an early stage of learning English

School (C) has 1,437 pupils and students; there are 1,200 pupils in Years 7 to 11 and 205 students in the sixth form. Numbers in the sixth form have increased in recent years and the school is much larger than other secondary schools. Pupils and students come from a mixture of local authority and private housing. The school has an above average proportion of pupils with English as an Additional Language, but only one of these is in the early stages of English language acquisition. The proportion of pupils with special educational needs is below average and the proportion of pupils with statements of special educational needs is broadly average. The percentage of pupils entitled to free school meals is below average. Pupils are predominantly from white British backgrounds, and about ten per cent are from Pakistani, Indian and Black Caribbean families. A small number are from European countries. Attainment on entry to the school is broadly average, although the proportion of pupils obtaining the higher levels in the end of Key Stage 2 national tests in primary schools was below average.

School (K) is a secondary school with approximately 1300 pupils in the school. There are more girls than boys in Years 7 to 9. The ethnic composition of pupils in the school reflects the local community. Most pupils are white but there are significant numbers of pupils whose ethnic origin is Pakistani, Caribbean or from Asian countries. The proportion of pupils with English as an Additional Language is higher than in most schools although there are only five pupils at the early stages of learning the English Language. There are four pupils who are refugees or asylum seekers and three pupils who are in public care. The number of pupils identified as having special educational needs is

below the national average. However, the number of pupils with statements of special educational needs is in line with the national average. Most pupils when they leave the school go into full-time education but nearly a fifth enter employment. The school caters for the full ability range but on average the attainment on entry is above the national average. Few pupils join the school other than at the usual time of admission. The area the school serves, based on the number of pupils who are eligible for free school meals, is a slightly more advantaged area when compared with national data. The school is oversubscribed. The school is a specialist Technology College and gained a Schools Achievement Award in 2001, 2002 and 2003. The school gained the Sportsmark Award in 2004 and became a Beacon School in 2000 until 2004 when the scheme finished. In 2003 the school became a Partnership Promotion School. The school has a strong partnership with its local University and a local College. The school is active in promoting the Duke of Edinburgh's Award Scheme and is involved in an Enterprise Curriculum initiative called 'Setpoint'. These indicate a wide range of socio-economic intake.

This chapter seeks to acquaint the reader with the overall design of the study and provide an account of the methodology, assessment instruments and statistical techniques employed in the research together with the rationale for their use based on the relevant literature. The following procedures were employed to obtain participants' views and to put them in an appropriate context: -

1. Overall design of the study;
2. Introduction to the methodology;

3. Process of school observations;
4. Construction of the questionnaire;
5. Sampling;
6. Distribution of the questionnaires and data collection;
7. Statistical procedures (SPSS) used;
8. Construction of the interview questions;
9. Conducting the interviews with the students of the year 9 and year 10.

5.2. Overall design of the Study

The research design is essentially analytical Cohen et al (2002) observe that the conditions or relationships that exist, practices that prevail, beliefs, point of view, or attitudes that are held, processes that are going on, effects that are being felt, or trends that are developing, all play an integral role in valid research. At times, descriptive research is concerned with how 'what' is or 'what exists' related to some preceding event that has influenced or affected a present condition or event and the reasons why this has produced such an affect or event.

The study was designed as five related stages. Each stage can be considered in isolation but it is important to emphasis that each step is closely related to the others. Data gathered in one stage was used to lead into the next stage concerning the aims of the research which have been stated in chapter 1. The following are the five stages used in this study: -

- 1) The initial school study was carried out in a number of secondary schools through schools survey, observations and interviews in order to: -
 - i. Understand the socio economic background of the schools.
 - ii. Discover who teaches ICT.
 - iii. Explore the ways in which computers were used, within subjects or as a free standing one.
 - iv. Carry out an observational study to evaluate pupils' behaviour towards computers.
- 2) Devise a questionnaire for the pilot study addressed to the small sample in order to get the initial information which helped in constructing the final questionnaires used for the quantitative approach using received observation with regard to format and design.
- 3) Pilot interviews were also conducted to get the initial qualitative data.
- 4) A survey questionnaire addressed to the whole sample of school pupils.
- 5) Interviews carried out with a selected number of pupils.

5.3. Sample size

The sample size of pupils' for both the questionnaire (310) and semi-structured interview (29) was large enough to be representative and ensured that variables such as age, gender and year group were covered. The total population is widely scattered geographically. It was very difficult to involve a whole population; because of factors such as expenses, time and accessibility in obtaining data or measures from the whole population. Therefore the researcher used a sample in order to represent the target population as a whole.

As mentioned by Robson (1995) and Cohen et al (2000) the random method is an appropriate method to represent the whole population because it gives every member of the population of a study a chance to be part of the sample.

It was explained to approximately 320 pupils what the research study was about – some were obviously interested and some were not in any way interested in what was being studied. The pupils were given the opportunity to volunteer to complete the questionnaire. A small number did not want to complete the questionnaire. Some pupils wanted to complete the questionnaire after school rather than in the lesson – they suggested that the questionnaire may be a source of distraction in the lesson and would rather complete it at the end of the school day. When questionnaires were completed pupils were given the opportunity to take part in the interviews. Some pupils readily volunteered; others were less willing. There was a range of abilities represented in this group. This group inevitably included some who were disaffected with school, but the majority showed an interest in the subject of ICT.

5.4. Introduction to Methodology

Cohen et al (2002) observed that the purposes of the study determine the methodology, and the research designed is governed by the notion of ‘fitness for the purpose’. This is supported by Kaplan (1973) and Best and Kahn (1993) Denscombe (1998) notes that researchers have developed many different methods and tools for gathering data. Evans (1984) suggests that there are three types of research styles to consider when designing a research study, the ethnographic study, the experiment, and the survey (Bell et al 1984).

5.5. Research Methods used in this Study

The survey approach, which is quantitative in nature, was the most appropriate technique for collecting much of the data for this study. In the survey, observations, and questionnaires, interviews and tests, are ways of obtaining data. In this research, tests are omitted because the study deals with pupils' attitudes towards computers rather than their knowledge about computers.

In considering the aims and objectives of the study the researcher tried to integrate the ideas of these writers and employed the method of conducting an initial school survey and using observational techniques for the fieldwork. These are followed by both the quantitative and qualitative data to pursue the investigation, get additional categories of information and more accurate data, generalisability of findings and historical interpretation. As Wragg (1980) asked

“How does the evidence collected compare with the sources of evidence”? (p.17)

In this study the researcher decided to start with observation as the first stage while collecting the pilot study questionnaire and interview data by visiting schools in order to build up a social context and get the idea for developing the final questionnaire followed by the qualitative approach (detailed pupils' interviews). The final questionnaire was subjective and related to the theoretical framework of the study. While collecting quantitative and qualitative data at the second stage the researcher explored the wide and formal issues about the use of ICT in schools.

The following quantitative and qualitative methods were selected to pursue the research: -

- (a) School survey: - to explore the ways that computers are being used in schools, the types of computer modes implemented, and the availability of hardware and software resources. Additionally to discover the socio economic background of the schools and the system of computer use adopted; to discover if the teachers who teach ICT are ICT trained and carry out an observational study to evaluate pupils' behaviour towards computers.
- (b) Observations were carried out to gather information in order to evaluate the use of computers in schools and also to see the ways that computers were being used and the pupils' behaviours towards them.
- (c) The questionnaire was given to pupils in order to draw the research on from the initial two stages (survey & observations) concentrating on investigating the attitudes of pupils towards computers.
- (d) Interviews were arranged with a selection of pupils in order to gain additional information concerning the factors that affect their attitudes towards computers.

Sapsford and Jupp, (1996) explain that there is no single best way of collecting data; the method chosen depends on the nature of the research questions (p.98). This type of approach can involve questionnaires, social surveys or structured interviews (Burgess, 1985).

5.6. Research Methods used for the initial data collection are:

The researcher was of the opinion that survey and observation were the best method for determining the initial information regarding what is going on in schools concerning

computer use and how the pupils relate to computers. In order to obtain the prime data the researcher decided to use quantitative approaches (i.e. survey and observation).

5.6.1. Survey

The purposes of the schools survey mentioned earlier were: -

- To see the ways that computers are being used in schools,
- To observe the types of computer modes implemented, and the availability of hardware and software resources,
- To understand teachers' approach to the use of computers.

Surveys provide a relatively simple and straightforward approach to the study of attitudes, values, beliefs and motives (Kerlinger 1969; Bryman 1989; Robson 1993).

A survey is a quantitative approach that gives the researchers initial information to establish the background of the study adopting another quantitative approach (questionnaire) to collect facts, attitudes and beliefs and then compare the data. Measures involve statistical techniques which lead to quantified and, wherever possible, generalisable conclusions. This type of approach leads to research for generally applicable results, and predictions about behaviour, attitudes and beliefs. This research employs a combination of survey and observation for collecting the basic information. This was followed by detailed attitude questionnaires and interviews to collect the data for the study.

5.6.2. Observation

Pupils were observed in secondary schools to ascertain how they use computers, how they interact with teachers and how they work with their peers. Out of these observations came more detailed information about why they approach their work in the way they do. These would also function as vital initial research, to determine if there were any bigger issues to be addressed later in the survey.

In the present research quantitative data, through observation and questionnaire, was used principally to gain in depth information in order to evaluate the pupils' attitude towards the use of computers in schools.

Observations were carried out

- a) To gather information in order to evaluate the use of computer use in schools.
- b) To see the ways that computers were being used and how pupils behave towards them.
- c) To identify the factors that affect pupils' behaviour towards computers;
- d) To examine the differences in pupils' behaviour in schools.

Brown (1979) observes that pupils' behaviour during observation may be influenced by many different factors in addition to the related attitude for example, pupils' prior knowledge and experience of using computers, expectations of peer response, authority constraints, and the pupil's own intellectual, social or physical abilities. Observations, and specially those which are dealing with pupils' behaviour, have to be planned and used carefully.

Croll (1986) and others (Anderson 1954; Bulmer 1983; Simpson 1995; Burroughs 1971) noted, observed and reported that good observational techniques require particular skills. Through observation it is easier to understand what is going on, who or what is involved, when and where these things happen how they occur, and why (at least from the standpoint of participants) things happen as they do in particular situations.

Almost by definition commissioned observation is overt, at least to the client who has engaged the researcher, even it remains covert to those being observed. A covert observer like the researcher is able to move about the research setting freely. It is indeed this very freedom that allows us to observe our subjects accurately and honestly.

The researcher believed that using the observational technique and school survey allowed her to get to know the pupils as well as their teachers and the schools system. Most importantly this approach allowed pupils to get to know the researcher in the classroom context. This allowed for a closer relationship, which made it easier for them to express their feeling and opinions. Borg (1989) supported this point of view by indicating,

“Quantitative researchers strive to be personally detached so that their observations are as objective as possible. Detachment is achieved by using objective instruments, while qualitative researchers, however often interact closely with those involved in the study. The research data arise out of these interactions in the form of what people reveal to the researcher and the researcher’s impressions”. (p.23)

The researcher must then define and attempt to measure data and identify the drivers of engagement, specifically the inter – relationship of different aspects of student life that have the greatest impact on engagement levels. Ridgway (1986) asserts that the ultimate

acceptability of Computer Assisted Learning (CAL) for general use must be based on observation of its use in representative classrooms.

The observations were carried out to evaluate pupils' behaviour towards computers to yield the initial information. It was hoped to acquire this partly through observation and mostly through an attitudinal questionnaire administered to pupils themselves. Observational studies are criticised for being subjective Pupils can be influenced by the presence of an adult in the classroom. The researcher tried as much as possible to minimise such effect by using some of the following procedures: -

- A tape recorder was not used so as not to disturb them;
- Notes were not taken in front of the pupils, but immediately after the observation session finished.

Through these observations, the researcher aimed to monitor the pupils' activities in the class, especially those concerning their behaviour towards computers.

5.7. Selection of Sample for Observation Technique

Observations were necessarily limited to a small number of schools. The schools were similar to each other in approach of teaching and learning ICT but different in ICT resources. The schools also used different teaching modes. The first schools A and B selected were very well resourced. This was selected to represent an example of schools which are using the computer as tool and also in other curriculum subjects. The schools c and D were adequately resourced. Some of the middle class schools use computers only

as a tool. Some use it in other subjects to a greater or lesser extent. In contrast schools D and E chosen were badly resourced. This one was also chosen as an example of a poorly resourced school with poor information technology practice. All schools were mixed sex.

Observational studies are sometimes criticised for being subjective and lacking in the precise quantifiable measures that are the hallmark of survey research. Most attempts to improve observation have recommended the separation of subject and objective in an effort to eliminate personal frameworks. However, this researcher believes that the quality of personal frameworks is important and should not be eliminated.

5.8. The Pilot Study

Bell (1994) stated that: -

“All data gathering instruments should be piloted to test how long it takes recipients to complete them, to check that all questions and instructions are clear and to enable the researcher to remove any items which do not yield usable data”.(p.65)

The importance of a pilot study is highlighted by many researchers (Bell at al 1984; Cohen and Manion 1987; Evan 1984; Bell 1992; Anderson 1990; Anderson 1998; Bell 1999).

By timing the response it is possible for the researcher to establish elements of the instrument that are too difficult to understand easily. This timing also offers the researcher a guide as to the length of time it would take to complete the intended instrument. The researcher also needs to establish whether there is more information from

other sources that are more easily accessible, for example from school records. The pilot will also enable the researcher to establish whether any important questions have been omitted or need to be rephrased. Individual of questions may also be evaluated at this stage. For example, factual information can usually be gleaned with the aid of a simple 'Yes'/'No' type answer. However, could more information be offered if the format was more informal? Some individual words used may be subjective and very difficult to quantify. Some words may be subjective and suggest emphasis where none was intended.

In the pilot study both quantitative and qualitative methods were used. Data was gathered concerning the ways computers are used in school and at home, pupils' attitudes, behaviour toward the use of computers, their thinking, and feelings. Quantitative and qualitative approaches are tools of investigation with the common purpose of drawing conclusions; each has its own characteristics (Burges 1985; Borg 1989; De Vaus 1991; Kidder 1981; Evan 1984; Borg 1989; Anderson 1998; Bell 1992).

The researcher chose to use a combination of qualitative and quantitative research tools in order to maximise the benefits of both methods. Sapsford and Jupp (1996) explain that the pilot study is a small scale trial before the main investigation and is intended to assess the adequacy of the research design and the instruments to be used for data collection. Piloting as part of data collection is essential (p.103). This allows the researcher to.

- Identify potential bottlenecks in the project (the i.e. time taken to collect or analyse data),
- Determine whether or not the data collection technique is feasible,

- Determine how detailed the data needs to be,
- Determine how long the processing and analysis of data takes,
- Decide how to extract data from the material collected.

Oppenheim (1992) mentioned that the earliest stages of the pilot work are likely to be exploratory and will be primarily concerned with the conceptualisation of the research problem (p115). This means that carrying a pilot survey can be an effective means of determining the viability of a survey. It can help the researcher to avoid some of the problems that only come to light after data has been collected and the analysis and interpretation has begun. “If only I had recorded/collected/asked X then I could have carried out Y analysis and answered question Z”. Often it is too late to rectify this situation. Piloting can not only help with the procedural matters such as ordering the questions but can avoid costly mistakes.

5.9. Methods used in Attitude Measurement

Investigations involving attitudes necessitate an evaluation in depth to be carried out through different measurement techniques. The researcher used two methods of attitude measurement. Although both approaches are tools of investigation with the common purpose of drawing conclusions, each has its own characteristics. For the purpose of this study triangulation is used, i.e. quantitative (questionnaire) and qualitative (semi-structured interviews).

5.10. Triangulation

This approach depends on using multiple techniques in the same study for the same subject. Triangulation is considered a sound approach in educational and social research, because collecting the data from a variety of sources establishes a more accurate view of the area under investigation. The importance and usefulness of using triangulation is explained by others (Cohen and Manion 1985; Webb et al 1966; Burgess 1985; Best and Kahn 1986; Burgess 1989; Borg and Gall 1989; Robson 1993; Denscombe 1998).

The researcher believes that the advantage of using different methods would be to make certain that the results are reliable and valid. It is possible to cross check the results and only then it is possible to explain which are more reliable than others, if there are any variations. The integration of surveys, observations, questionnaires and interviews helped identify not only 'what exists' as regards to computer use in schools but also helped to construct the 'why' and 'how' of the pupils' behaviour.

Blease (1986) recommended that researchers employ a variety of research methods in order to monitor the use of Computer Assisted Learning (CAL) material as well as to obtain normative data with which to judge effectiveness.

However it depends on the different styles, traditions or approaches for the collection of data. There are occasions when quantitative researchers draw on qualitative techniques and vice versa.

5.11. Sample Size for Questionnaire

Schools were selected in order to give a wide and representative range of differences. This was in order to secure an “average” and “typical” selection of students; drawn from different social backgrounds and levels of ability. In truth, there can be no such thing as a “typical” student. However, for the purposes of this research it was decided that the selection of participating schools would be able to offer an approach that came closest to an accurate representation of schools and students within the community as a whole.

The important features of this study were the consistency of the results. The rationale for using sampling in educational research lies in the fact that it is difficult to study every individual person in the population to whom the study relates. Therefore classes were selected randomly to represent the pupil sample which sought to have the same characteristics as the rest of the population. The researchers’ main concern was to make sure that this sample was representative (as closely as possible) of the population as a whole. The respondents were allowed 20-25 minutes in which to complete the questionnaire. Some respondents completed the questionnaire in about 15 minutes whereas others took a full 25 minutes to complete.

A total of 322 questionnaires were distributed and 310 completed questionnaires were collected which produced a response rate of 96.27%. Although the difference was small, slightly more girls 157 (50.65%) than boys 153 (49.35%) completed the questionnaires altogether.

Table 1**Sample Size for Questionnaire**

Gender	Number of Respondents	Percentage
Male	153	49.40%
Female	157	50.60%
Total	310	100.00%

The researcher distributed about an equal number of questionnaires between boys and girls in each year. However the number of questionnaires distributed in each school was slightly different, dependent on the level of interest of pupils in completing the questionnaire. The breakdown in terms of year group showed that from year 9 the same number of boys (i.e. 78) as girls (78) completed the questionnaire and from year 10 slightly more girls (79) than boys (75) completed questionnaires.

Table 2**Breakdown of Sample Size in terms of Year Group**

Gender	Year 9		Year 10	
	Frequency	Percentage	Frequency	Percentage
Male	78	50%	75	48.70%
Female	78	50%	79	51.30%
Total	156	100%	154	100.00%

The following table shows the frequency and percentage break down between the gender difference and split of the respondents by year groups of different schools who completed the questionnaires from different schools.

Table 3**Breakdown of Sample Size in terms of Gender Difference Year Group Difference**

School Numbers	Gender Difference				Year Group Difference			
	Boys		Girls		Year 9		Year 10	
	<i>*f</i>	%	<i>*f</i>	%	<i>*f</i>	%	<i>*f</i>	%
1.	31	20.3%	31	19.7%	31	19.2%	32	20.8%
2.	24	15.7%	25	15.9%	24	16.0%	24	15.6%
3.	28	18.3%	28	17.8%	28	17.9%	28	18.2%
4.	25	16.3%	27	17.2%	28	17.9%	24	15.6%
5.	23	15.0%	24	15.3%	23	14.8%	24	15.6%
6.	22	14.4%	22	14.1%	22	14.2%	22	14.2%
Total	153	100.0%	157	100.0%	156	100.0%	154	100.0%

****f*: - Frequency**

%: - Percentage

5.12. Structure of the Questionnaire:

Questionnaires are used when there is a need to collect relatively routine data from a large number of individuals. This is also highlighted by other researchers (Neil 1985; Anderson 1990; Bell 1992; Oppenheim 1992; Robson 1993; Oppenheim 1996; Cohen 1997).

The researcher used a self-completion questionnaire because it is clear, unambiguous and uniformly workable. However much depends upon the design of the questionnaire. If the design is not thought through then the resulting data can produce unreliable information.

Oppenheim (1996) noted that most of the questionnaires employ closed questions i.e. those requiring a 'Yes or No' answer. These are quicker to administer and make scoring simpler, but there is inevitably a loss of spontaneity and information. More open questioning, at least at face value, appears to allow more opportunity for individual options to be expressed. However, practical considerations at the time of answering, such as time and space, and the necessity to categorise or summarise answers mean that information will need to be sifted, perhaps in a less systemic way than when questions are closed. The researcher used a few closed questions but most of all the questions were 'multiple choice' (i.e. offering several answers from which one response is to be chosen) and the 'Likert scale'. Borg (1989) and other researchers (Burgess 1985) noted that Likert scales are probably the most common type of attitude scales constructed. Cohen and Manion (1987) call this type of technique 'scaled response'. For example it is possible to present the respondents with a sentence and ask them to agree or disagree by indicating a response on a three, five or seven point scale.

5.13. The Advantages of using the Questionnaire

The usual reason for using the questionnaire is that this instrument has many advantages as argued by other researchers (Neil 1985; Seliger 1990; Sapsford and Jupp 1996; Cohen 1997). The researcher selected the sample randomly. (The questionnaire included the techniques of learning Information Technology skills at secondary school level, age 14-16).

5.14. Disadvantages of using the Questionnaires: -

Many researchers such as Engelhart (1972); Mouly (1978); Burges (1985); Cullingford (1999) described the disadvantages of using the Questionnaires. Therefore the researcher used another instrument to collect data, the semi- structured Interview. Before the researcher describes the qualitative part of the researcher will explain the methods of constructing and administering the questionnaires.

5.15. Construction of the Questionnaire

The pilot study started with 56 closed items. After piloting the questionnaire the researcher found that there was a need for re-designing it. The questionnaire involved 57 attitude items developed from the pilot study. These items were designed to be either positive or negative, using multiple-choice questions, and the Likert scale. More choices were provided for pupils' to show their views. (Five point Likert scales were used in some questions but they were not given numbers. For the Likert scale different phrases were given to the pupils' like 'very interesting', 'quite interesting', 'interesting', 'slightly interesting' and 'not interesting at all'. Scoring for items depended on the choices given in each item. Scoring of the questionnaire for all types of question is given in the following tables.

Table 4

Yes	1
No	2

Table 4a

Very Interesting	1
Quite Interesting	2
Interesting	3
Slightly Interesting	4
Not Interesting at all	5

Table 4b

I can do more work.	1
I can work faster.	2
They give lot of information.	3
They make me think differently.	4
They give me different information than I can get elsewhere.	5
They make my work look better	6

The reason for using different types of question is to explore more material about pupils' attitudes and behaviour.

5.16. Administering the questionnaire

Aware that students would be completing the questionnaire in a variety of settings, the guidelines reflected the desire to create uniformity in the conditions under which the questionnaires were completed. Teachers were made aware in advance that completion of the questionnaire would require approximately 20-25 minutes. For the completion of the questionnaire teachers introduced the researcher to students in the class. The questionnaire was introduced to the students to allow them to read and complete the questionnaire. Students were allowed to complete each item in an approximate time of 20-25 seconds. Questionnaires were only given to those students who showed interest in completing them. The observations by the researcher administering the questionnaire in the presence of the teacher implied that students were interested in and engaged by the questionnaire. This would seem to be of at least superficial significance in suggesting that comprehension was sound. Students were clear that this was not a test. However, it was important to impress upon students the value of their responses in allowing school to incorporate "the students' perspective" and they were told their views, opinions and

responses were valuable for this study. These views will remain anonymous and confidential. With the questionnaire a covering letter was attached with necessary instructions to consider while completing the questionnaire. This page included three factual items. The first item was the school code number and the code by year group. The questionnaires were printed on two different colours (pink for girls & blue for boys) and other instructions were important for subsequent data entry. It was hoped that this relatively straightforward page would put students at their ease and give confidence in knowing what to do. A small number of students (11 from a response of 310) chose to withhold details of their and the schools' name.

Burgess (1985) stated that in quantitative research methods, the researchers attempt to keep themselves from influencing the collection of data. In qualitative research they are themselves a primary instrument for collecting data. Combining both methods, can obtain richer and more accurate data. Quantitative data provides the basic research evidence while qualitative data rounds out the picture and provides examples and reasons.

5.17. Qualitative Approach

Burgess (1985) describes this approaches as involving more open-ended, 'free response' questions based around such techniques as informal, semi-structured interviews, observations and diaries. Qualitative techniques tend to be more time consuming than quantitative approaches both in techniques for data collecting and in the subsequent analysis (p.172).

Bell (1992) describes researchers who adopt the qualitative technique as trying to understand individuals' perceptions of the world and how they make sense of situations. They are more concerned with insight rather than statistical analysis. In a study of this kind there are advantages to be gained from combining quantitative and qualitative approaches as supported by Burgess, Parlett and Hamilton (1976); Venezky (1983); (1985); Bryman (1988a); Hannon (1989). Similarly Cullingford (1999) argues that the only way to gather information about what really happens inside an individual is through qualitative methods (p.23). He also argues that the only way to gain an insight into the lives of the individual is through interviews, but these are often neglected.

The questionnaire provided a statistical explanation but the depth semi-structured interviews revealed underlying attitudes and feelings towards using computers in school and at home.

5.18. Structure of the Interview

Borg (1979) viewed the interview as a research method as unique in that it involves the collection of data analysis through direct verbal interaction between individuals (p.307).

Moser and Klaxon (1971, p.271) describe the survey interview as “a conversation between interviewer and respondent with the purpose of eliciting certain information from the respondent” (Bell 1992; p.70; Patton 1980; Lincoln and Guba 1985; Bogdan and Biklen 1992; Oppenheim 1992; Le Compte and Preissle 1993; Cohen 1994; Cohen et al 2000) described the number of types of interview. Although the process of gathering data

by interview is expensive and time consuming, this method has many advantages. Bell et al (1984) suggest that:

“Interviewing is a complex if enjoyable way of collecting information”. (p.194)

5.19. The Structured interview is easy in many ways to administer and to analyse. The interviewer has a questionnaire and simply ticks or circles the answer. However the problem with this type of interview is that it leaves little scope for the interviewee to offer additional comments (Lofland 1971; Parlett and Hamilton 1976; Mishler 1986; Burgess 1989; Jones 1991; Bell 1992; May 1997). Taking these points into consideration the researcher in this study decided to use the semi-structured interview format. The sample size of the Interviews was 29 pupils.

5.20. Structure of the semi-structured interview

In this study semi-structured interviews were used. The semi-structured interviews built on the statistical findings of the questionnaires would enable the researcher to check and expand on the findings of the questionnaire. Important issues and trends were re-conceptualised and developed into an interview schedule, which allowed the results of the questionnaire to be checked with the semi-structured interviews. A number of factors were taken into account when designing the interview schedule. This included a number of issues that could be included bearing in mind the length of the interview. A long interview schedule may mean that the respondent could become ‘bored’. An average interview lasted between 30-40 minutes.

Borg (1979) and Marshall and Rossman (1999) observe that it is recognised that this research tool has some disadvantages because of subjectivity and bias during the interaction between the researcher and the individuals of the study. In addition it can be affected by the eagerness of the respondents, the tendency of the interviewer to seek out answers that are acceptable to his beliefs, or the vague antagonism that sometimes arises between the interviewer and the respondents. The interviewees may be unwilling or may be uncomfortable sharing all that the interviewer hopes to explore. These are problems in interviewing that may give inaccurate or incorrect data.

These types of issues can reduce the reliability and validity of this instrument. As Cohen and Manion. (1985) emphasised the researcher has to do his best to avoid these potential problems and to increase the reliability and validity of the interview by employing greater sensitivity. Anderson (1990) suggests that people are more inclined to agree to an interview than they are to fill in a questionnaire. This may be that because the interview is a method of collecting data through direct verbal interaction it allows for greater depth than can be expected through other methods of data collection. Borg et al (1979) justify the use of semi-structured interviews in the following way:

“The semi-structured interview is generally most appropriate for interview studies in education. It provides a desirable combination of objectivity and depth and often permits gathering valuable data that could not be successfully obtained by any other approach”. (Borg et. al 1979; p.313)

5.21. The Advantages of the Interview

The interview, either semi-structured, or indeed structured, is a valid research method. A major advantage of interviews is that we deal face to face with the respondent. The

researcher can pick up body language, facial expressions, and the tone of reply. The researcher can also ask for verification or clarification of a point. A written response cannot offer these advantages: questionnaire responses have to be taken at face value.

Cohen and Manion. (1994) describe that this kind of interview has many advantages such as flexibility, allowing the interviewer to go into more depth, enabling the researcher to clear up any misunderstanding and test the limits of the respondents' knowledge. If the appropriate climate has been created, it permits the researcher to gain a picture of what the respondent really believes.

Borg (1979) described the advantages of interview thus:

- a) Interviews provide immediate feedback;
- b) The interview permits the research worker to follow up leads and thus obtain more data and greater clarity;
- c) It permits much greater depth than the other methods of collecting research data;
- d) Its principal advantage is its adaptability. (p.310)

Hedrick et al (2000) contend that the personal semi-structure interview was considered by the researcher to present several advantages, such as the greater length of time people are prepared to spend answering questions, and the rapport and sense of trust engendered. They have the potential to encourage respondents' greater co-operation with the interviewer.

Cohen and Manion (1987) note that interviews offer a method of finding out what individuals know based upon knowledge and information. They offer an insight into the interviewees' values and preferences. They also offer a perspective of the interviewees' attitudes and beliefs. Borg and Gall (1979) write that the advantage of an interview is its adaptability. Bell (1992) suggests that such interviews allow the respondent to be guided around topics but offer a structure for the researcher to use when analysing the results at a later date. An interviewer needs to have the skills to ask the questions at the right time and to know when and how to probe. May (1997) suggests that questions are usually specified but the interviewer should not probe beyond the answers in a manner which would appear prejudicial to the aims of standardisation and comparability. This method also allows for clarification and elaboration of the answer given (p.111).

Cullingford (1992) argues that the only way to understand the experience of young people is to listen to what they say and this where an actual experience has a greater impact than any statistics (p.8). He explains that creating the right conditions for the interviews is important to ensure their reliability and validity, which means that interviews are lengthy in order to allow interviewees' responses to be discussed at length.

In this research all the interviews began with a discussion on confidentiality and anonymity, where it was made clear to all respondents that anything discussed in the interview would be kept confidential from any third party except supervisors of the study and the external examiner. They would still remain anonymous. All the interviews began with general questions. The purpose of the interview was to ask clear and unambiguous

questions without sounding awkward in order that the respondent could feel easy about answering the questions supported (McCracken 1986; De Vaus 1991; Oppenheim 1992).

5.22. Validity and Reliability of the Instruments

Cohen et al (2000) and others such as Fox (1969); Best (1981); Bell (1987); Rose and Sullivan (1995); Bell (2001) described the importance of validity and reliability are concerned with the quality of data collection, and these two concepts as multi-faceted. The relationship between the data obtained and the purpose for which it was collected must be established.

5.23. Reliability and Validity of the Questionnaire

The issues of validity and reliability of the questionnaire are vital in educational research (Best 1981; Kidder, 1981). The researcher must be aware that the validity of a questionnaire cannot be assumed but must be established. Thus, certain requirements must be followed such as the anonymity of respondents, adequacy of questions and presentation of the questionnaire. To assess the validity of the questionnaire the researcher used the content validity of the questionnaire items by using experts' validation from Huddersfield University, heads of ICT and some of the ICT teachers. The researcher explained to them the aims of the study and gave them a short briefing about the individuals who could participate in this study and complete the questionnaire. They were requested to read each question and give their comments and suggestions about the items and their relevance to the purpose of the questionnaire. In the light of experts' comments and suggestions the researcher re-phrased some of the questions.

After the final check to make sure the language and understanding of it was such that the pupils' could understand the questions and not misinterpret them, the questionnaires were distributed to the pupils of the year 9 and year 10 for the pilot study. As a result of the pilot study procedures the researcher was confident in the validity and reliability of the research instrument 'questionnaire' and the questionnaires were considered to be appropriate for the study.

5.24. Reliability and Validity of the Interview

Cohen et al (2000) reported that the canons of reliability for quantitative research (i.e. hypothesis methodology, formulation, testing and inference) may be unworkable for qualitative research. In qualitative research reliability can be regarded as a fit between what researcher records as data and what actually occurs in the natural situations that are being researched. Kvale quoted in Cohen (2000) suggests that, in interviewing, there might be as many different interpretations of the data as there are researchers.

The interviews in this study were semi-structured, ensuring that the same questions were answered but none in a rigid order or in a formulated way. For the validity of the interviews in this study the researcher used the 'convergent validity' type. Cohen (2000) also contended that this method assumes that the validity of the interview is comparable with proven validity of other measures, adding that the questionnaire data supported the interview data, and this type of comparison is the most practical way of achieving greater validity of the interviews.

5.25. Ethical Issues

Miles and Huberman (1994) contended that

“Most qualitative researchers are unlikely to lie, cheat or steal in the course of their work but broken promises are not unknown. Some researchers have reported deceiving respondents about the nature of the inquiry”. (p.292)

Such broken promises are likely to be counterproductive in both results and levels of trust. False promises of confidentiality for example are not only a gross breach of professional integrity but may also pose a potential threat to be interviewee if the data falls into the wrong hands. At the very least it may ensure that any further research may be compromised by future respondent’s concerns over honesty and openness (Cohen and Manion 1994; Hitchcock and Hughes 1995).

The researcher and the student are linked symbiotically in a mutual learning experience whose essential foundation is trust. The ethical issues inherent in this study have been given priority and consideration by the researcher before and during the fieldwork. The ethical issues that related to this study were concerned with confidentiality and anonymity, informed and issues of recording interviews.

These canons were at the forefront of the researcher’s mind throughout the study, ensuring that respondents were given clear and honest information throughout, kept in the frame as to what was going on by the use of an appropriate questionnaire format that protected anonymity and encouraged trust.

5.26. Issues of confidentiality

Confidentiality was given particular attention by the researcher with all the respondents' answers. The researcher was aware of the sensitive relationship between the students and their teachers. The commitment of confidentiality was given the first priority by the researcher during the fieldwork.

Hitchcock and Hughes (1995); Robson (1997); Cohen et al (2000) recommended that the researcher assure the participants that confidentiality would be guaranteed. If not the students and teachers may worry or not express their real perceptions and opinions. Similarly Mishler (1986) mentioned that guarantee of anonymity is more likely to produce truthful and candid responses. Sapsford and Jupp (1996) stated that the

“First principle of research ethics is that the subjects of the research should not be harmed by the research. It is for this reason that the researcher generally promises respondents' confidentiality. This is a promise that the respondent will not be identified or presented in a identifiable form and anonymity, (i.e. a promise that even the researcher will not be able to tell which responses came from which respondent)”. (p.318-319)

Accordingly the researcher did not require participants to reveal their names or schools. Their identity would not be revealed or recognised, and this was practised rigorously, in order to maintain the integrity of response and the human dignity of the respondent.

5.27. Informed Consent

Diener and Crandall, quoted in Cohen et al (2000) defined informed consent as “the procedures in which individuals choose whether to participate in an investigation after being

informed of facts that would be likely to influence their decisions”. (p.51)

The first permission was obtained from the head teachers and the ICT teachers in the schools and students were also informed before completing the questionnaire. Before they started completing the questionnaires all respondents were assured of personal anonymity and the purpose of the study. The head teachers and the ICT teachers were given a brief description of the research.

Mishler (1986) stated that: “Informed consent procedures are intended to minimise negative, social and personal consequences and serve the purpose of allowing subjects to assess the risks of their participation in a study” (p121). Sapsford and Jupp (1996) argued that informed consent is a grey area and an important consideration for any research. The concept of informed consent is not an easy answer to a set of moral dilemmas because it is neither simple nor clear cut.

For the purpose of this study informed consent was firstly the agreement between the respondents and the researcher to complete the questionnaire and secondly the consent to be interviewed. The researcher made it clear to all the respondents that they were free to withdraw at any stage while they were completing the questionnaires or during the interviews. As Robson (1997) and Cohen et al (2000) contend, the participants should be given the right to withdraw at any stage or not to complete particular items in the questionnaire if they so choose.

5.28. Issues of Recording Interviews

All the interviews began with a discussion on confidentiality and anonymity, where it was made clear to all respondents that anything discussed in the interview would be kept confidential. Interviews were recorded but before that it was made clear to the interviewees that only the interviewer would listen to and transcribe them. If she did get help in transcription there would be guaranteed anonymity and confidentiality and after that the tape would be destroyed.

A schedule was formulated for the interview. There were a few initial questions followed by probes. The schedule contained spaces for notes to be included. The semi-structured interview seemed, on balance, the most appropriate form of interview to use in this study because the researcher wanted more information than simple 'Yes/No' answers. The researcher felt that valuable data could be gathered using this method that could be missed in a more formal structure. The semi-structured interview offered the respondents the opportunity to go into depth on topics that they felt strongly about. It also allowed the interviewer the opportunity to probe areas that were touched upon. Both notes and tape recorder were used in collecting data. The interviews were conducted in a friendly and informal atmosphere. It is important that an interview should be an enjoyable experience and resemble a discussion rather than a formal interview, which according to Mc Neil (1985) is an artificial situation for many people (p.47).

5.29. Data Analysis

This part is divided into two sections. Section one deals with the analysis of the pupil questionnaires. Section two deals with the analysis of the pupils' interviews.

Robson (1997) states that the main purpose of collecting data (quantitative & qualitative) is to find answers to the researcher's questions. Denscombe (1998) explains that quantitative research usually deals with numbers as the unit of analysis and tends to be associated with description and small-scale studies. Qualitative research usually deals with words as the unit of analysis. The distinction between these two approaches lies in using words or numbers as the basic unit for analysis and small and large- scale studies.

5.30. Quantitative Data Analysis

Denscombe (1998); stated that:

“Good quantitative research need not require advanced statistical knowledge”. (p.177)

Denscombe (1998) asserts that researcher who wishes to use quantitative data should understand the type of data they are using and select and use the most accurate statistical analysis. There are certain statistical techniques that work with some kinds of data which do not work with others.

The Statistical Package for the Social Sciences (SPSS) was used for the frequency and the percentages of the responses. After counting the frequencies and percentages, the data was presented by using frequencies and percentages only because of the type of the

quantitative data and the number of responses. This subsequently made it clear and easier to interpret the responses.

5.31. Qualitative Data Analysis

The source of qualitative data in this study was the semi-structured interview. The analysis of qualitative data involves the organisation and interpretation of collected data. Qualitative data was necessary to conduct 'some exploratory work' within a field where little published work was available on the pupils' behaviour and attitudes towards the use of computers in secondary schools. Qualitative data also enhanced the value of quantitative data.

Miles and Huberman (1994) note that there are several ways of using qualitative data which are usually in the form of words rather than numbers. Yet analysis of this data is one of the main problems which the researcher will be faced with in his or her research.

The researcher in this study used content analysis and hand-coding techniques to analyse and interpret the qualitative data. Mark et al (1994) contend that the content analysis method enables the researcher to understand which concepts are contained in the data, why these ideas occur and why individuals interpret these issues in different ways. This enables some comparisons to be made with the data obtained from the fixed response questions in the questionnaires.

The researcher read the data carefully and noted dominant themes. The interview questions were formulated around the main issues that emerged from the questionnaire

results and from the literature review. A colour coding system was established for the theme, the data was read carefully highlighting statements appropriate to the themes in an appropriate colour. This gave a list of qualitative statements on the theme and a quantitative measure of the number of people who expressed an opinion or view on the theme. The researcher organised and sorted the responses into the areas of the themes based on the importance shown by the respondents and further areas of importance emerged from this analysis.

5.32. The Time Scale of the Research

There are continues improvement in computers and in the software. There are also continuing efforts to improve the training of teachers, and to provide better and more up to date equipment. The research should not leave any thing to be assumed (Borg & Gall; P79). This research looked at pupils attitudes to computers in school was begin in:

1999- 2000: - Preparing the research proposal and refining the research instruments.

2000: - 1st and 2nd piloting the instruments.

2001 – August 2002 Literature review

September 2002 - August 2004 -Suspension from university due to illness

September 2004- December 2004

This period can be divided as follows:

Visited 6 schools in different regions of West Yorkshire for the collection qualitative and quantitative data.

January 2005-April 2006.

Literature review

Categorizing the data.

Analyzing the data.

Interpreting the result.

Conclusion implication and recommendations.

Conducting up-dating literature review.

Writing up the research.

Submitting the first draft of dissertation.

May 2006

Final submission of dissertation

5.33. Conclusion

This chapter has examined the methods used to investigate the research concerns, as expressed in chapter one and in the literature review in chapter 3, 4 and 5. The themes are computer use in schools, has pupils learn computing in school, focusing on their attitudes towards the use of computers, their feelings, behaviour, the development of computer skills (if they have any) and what schools are doing to help them learn with computers effectively and interestingly. In order to give a broad and deep understanding of the concerns and to practice possible recommendations for the further studies, it was decided to use both quantitative and qualitative approach. These concerns form the basis for analysis and discussions of the results of empirical investigation. The chapters 8-13 present the findings of the study.

CHAPTER 6

FACTORS AFFECTING THE USE OF COMPUTERS IN

SCHOOL

Chapter 6

Factors affecting the use of computers in school

6.1. Introduction

Previous research has identified some factors which might affect the relative use of microcomputers by children. In addition to those factors the researcher has identified more important factors which were either ignored, or disregarded in previous research which really limit the use of computers in schools. In this chapter following factors will be discussed briefly: those factors are briefly discussed.

- Factors affecting pupils
- Factors concerning schools.
- Factors concerning home.

Each of these factors will be discussed in the following section.

6.2. Factors affecting pupils

- Gender, the individual and group learning;
- The pupils understanding of the computer, and the attitudes of pupils towards the use of computers in schools;
- The pupils' interest, degree of motivation, enjoyment, pleasure and amount of prior computer knowledge;
- The pupil-teacher interaction in the classroom and the children's interaction with each other;
- The amount of time available for computer use.

6.2.1 Gender, the individual and group learning;

Hawkins, et al (1982); Hughes and Greenhough (1989) found that girls did not perform well using computers. Clements and Nastasi (1998); Underwood and Underwood (1990); and Monteith (2000) contend that working in a group and collaboratively is a social act. In contrast, Light and Colbourn (1987); Underwood (1990) found that girls were as successful, if not more so, than boys.

The researcher observed that children working in mixed gender groups (Year 9 and Year 10) do not show collaborative learning. Mostly they have social talk with each other and develop their social interaction skills rather than learn. The researcher also found that children prefer to work individually on computers in schools. They prefer to work at their own pace but they will help each other if they need any assistance.

Underwood (2000) found that “children working in groups did not necessarily mean that they were are working together. Chen’s (1985) findings reported in Hoyles (1988) indicated that girls felt strongly that females were as competent as males in using computers. The benefits of group work when using the computer are recognised by many researchers and teachers. As Fletcher (1985) notes, Johnson et al (1985) suggested that girls are more interested in co-operative activities than in competitive ones and that co-operative computer activities lead to more positive attitudes towards computing as well as to greater educational gains. Culley (1988) found that girls are less interested in computer-based activities than boys.

Both boys and girls whether working individually, in pairs, in small or large groups, mixed

groups or separate boy and girl groups have equal access to machines and the tendency of work was similar in all groups. It was also observed that children who were working individually on computers were concentrating more than those who were working in groups. Those children who were working in groups were often using their time in social talk with each other. They showed more tendencies towards talking with their friends than actually working on the computers in the classroom.

6.2.2. The pupils' understanding of computers, the ability level, the personality and attitudes of the pupil towards the use of computers in schools;

Collis (1996) wrote that

“The students' attitudes towards computers are considered to be very important indicators of students' inclination to adopt this new technology in their lifelong learning. (p.38)

Despite this there appears to be a lack of literature on the pupils' ability level and their personalities applied to ICT. It is evident from the observation sessions that pupils' ability and personality may have some effect on their attitudes. Pupils who showed little interest in using computers were mainly those who already had prior knowledge regarding the use of computers. They learn from different places e.g. at home, computer clubs, in their friends' homes, community centres, libraries etc. However this does not mean that they show interest in all the different lessons in which they may use computers. This all depends on their interest in those lessons or the computer exercises themselves. They show more interest in these lessons they understand. All the pupils in the classroom had the same chance to get a machine and to work at their own pace.

As Kelly (1981); Kiesler (1983); CCW (1990) observe, in ICT Mathematics and Science lessons, it has been found that boys tend to dominate and push aside the girls in order to get the best apparatus for their work although this was not corroborated in the present observation. Snow and Yallow (1982) suggested that there is a relationship between teaching style, ability levels and learning outcomes. Collis et al (1996) stated that: “Children are learning with and about computers, regardless of what happens at the system and even classroom level” (p.117). It has been assumed from previous research that pupils who work with computers on a regular basis are likely to have a positive reaction towards them. FEU (1986); Collis and Kwok-Wing Lai (1996); Knezek (1996) concluded that children’s attitudes on the whole were positive while they were using computers in school.

In the present study it was found that pupils who work with computers do not do so necessarily because they like them or have become addicted to them once they have started working with them. Children get tired, frustrated and lose their interest if they use them for a long time or do not fully understand what they are doing. Some people may like computers because they like technical gadgets. Working with computers could be different when under teacher supervision. This may cause even more frustration with their use and pupils may, as a consequence, reject them.

6.2.3. The pupils’ interest, the degree of motivation, enjoyment, pleasure and the amount of prior knowledge of using a computer

Motivation, interest, enjoyment and pleasure are the most important factors in learning. All these factors are vital in the use of educational information and communication

technology. Little work is done on these factors in relation to the use of ICT. Motivation, interest, enjoyment, pleasure or prior knowledge about the use of ICT and learning do not necessarily work together. A learner may learn even if not highly motivated, and a learner may not learn even if highly motivated, or has prior knowledge about using computers. Children learn about the use of computers because they need them for exams. Any type of activity that interests, excites, motivates and requires prior computer knowledge from children does not necessarily lead to successful learning. It is also assumed in previous research that secondary pupils' attitudes towards the use of microcomputers are also affected by their involvement with computers during their primary education and at home. Although motivation is strongly linked to the children's involvement in the learning process, little attention is given to all those factors in relation to the use of computers in schools and towards the classroom software that is assumed to motivate children. This can produce successful learning but in practice this is not necessarily happening in schools Miura and Tess (1984); Martin and Heller (1992); Shashaani (1993); Spitzer (1996).

In this study there were no significant gender differences in pupils' attitudes. During the survey, the researcher noted that sometimes girls were found to be more positive than boys in participating in computer activities. A negative interaction, lack of interest, enjoyment, pleasure, and confidence in using computers was found to be the same in boys as in girls.

6.2.4. The pupil-teacher interaction in the class or school and the children's interaction with each other.

In previous research (Cox 1989; Crook 1994; Spitzer 1996; Light and Light 1999; Monteith 2000; Mumtaz 2000; Science Direct 2001) it has been reported that pupils learn

by interacting with computers and with other fellow learners. Computers can act as a focus for wide discussion by giving pupils the opportunity to test ideas between each other for inputting information into the computer.

However, the researcher observed that ICT could also reduce social interaction with other individuals despite that fact that teachers can encourage pupils to work together on inputting their information on the computer. In most of the previous work on collaborative learning the emphasis is on the teacher, the software and hardware used to make the pupils work in a collaborative environment. The pupils' point of view (i.e. if they are willing to work with peers, in small groups or in large groups) is comparatively neglected.

Zanden and Pace (1984); Gayeski (1989); Fish and Fledmann (1990); Thomas Brush et al (1993); pointed out that when pupils use computers where there is no social interaction with their peers they are left feeling friendless and isolated. The researcher contends that these difficulties may not necessarily lead to the reduction in computer use in schools but it can make some pupils frustrated. Pupils of very high ability tend to get bored quickly from doing the same thing over and over again. It can be very tiring on the eyes and time consuming and can also develop a false sense of reality. Zanden and Pace (1984); indicated that the inquiry sub-mode, for example, involves a high degree of trial-and- error response, in which pupils spend a great deal of time solving trivial problems that a teacher could explain to them in a shorter time.

6.2.5. The amount of time available for computer use.

The amount of time available for computer use is shorter than desirable in schools and due to that lack of time pupils cannot practice on the machine to acquire the necessary skills to be confident and competent in using computers. In describing the factors that influence learning in general and learning about computers in particular, Carroll (1963) indicated that pupils differ in the amount of time required to learn a task (aptitude) and that they should be given enough time for learning (opportunity). Walberge (1985) supported this. The time using computers in schools is crucial and pupils need a reasonable amount of time to learn how to use computers in schools.

It is suggested as there is an emphasis on many learning processes, computer skills need to be developed over a period of time. It is simplistic to think that a pupil who goes on a course to learn about computers will be able to use them on a regular basis in schools. Pupils do not use computers in schools every day due to many factors which are discussed in different parts of this thesis. Skills that are taught will quickly fade away if they are not used regularly. Teachers are faced with the dilemma of both keeping up to date with a subject specialism and with a rapidly developing area of knowledge. Another time related factor is that of booking the computers prior to the lesson. There is nothing more frustrating than planning a lesson involving using the machines to find that someone else has already got a class in the computer room. This level of frustration occurs with teachers where many different subject areas may wish to use the machines at the same time.

6.3. Factors concerning schools.

- Maintenance of equipment in school;
- Availability of teaching and technical support staff;
- The availability, quality of and nature of the hardware and software courseware;
- Updating and funding.

6.3.1. Maintenance of equipment in school

Maintenance of hardware systems can be a problem especially if the equipment is subjected to heavy use. In addition, the environmental conditions could cause a problem. Computers and other hardware must be kept in a cool room, which has air conditioning and sun block curtains.

6.3.2. Availability of teaching and technical support staff

The time needed by pupils for a full understanding of computers and their use makes many demands on teachers, especially on the curriculum as a whole is so comprehensive. To keep up with new developments and to pay attention to pupils requirement, as well as embed. Computer use in different lessons is very difficult.

6.3.3. The availability, quality of and nature of the hardware and software courseware

In the evolution of educational technology a great deal of work has been done in developing effective, reliable and serviceable hardware and software. However, despite the large investment made by the education system, many schools lack quality hardware. The lack of sufficient hardware and the low usage of microcomputers have had a negative

impact on the educational system Cockroft (1982); Rhind-Tutt (1984); DES and the Welsh Office (1984); Wellington (1987); Wellington (1988); OECD (1989); Underwood (1990).

Nowadays, many schools still do not have one computer per pupil and it appears that this situation will persist for years to come. Another problem with the availability of hardware has been the continued development of machines in a very short period of time. The hardware problem is exacerbated because of the rapid development of computer technology. Many of the BBC, Apple, Macintosh computers were introduced decades ago and are primitive machines when compared to IBM or the computers which are now being introduced into schools.

The most important condition for the development of, and use of computers in education, is availability of sufficient hardware and software. Software is very expensive, and the drop in hardware costs does not mean that schools now have available resources of the new software. The whole process of using equipment and new programmes in schools needs careful understanding and evaluation in an attempt to maximize their benefits Smith, (1984); Bigum et al (1987); Johnston (1987); OECD (1989); Percival and Ellington (1988) and Burns (1990).

The purchasing of expensive microcomputers and peripheral equipment will nor bring about meaningful educational change on its own, nor will the software available for educational purposes to bring about change by itself. The software needs to be designed in a way, which can have a positive effect on the pupils' achievements. Since the early 1980s,

there have been significant shifts in the nature of educational software. For example, there has been a move from the use of skill and drill content laden software towards content-free or open-ended software which allows much greater freedom to the user. However that educational software does not necessarily improve the learners' interest, enjoyment, motivation and commitment towards the use of computers for educational purposes.

Hameyer (1989) indicated that in order to provide successful and exciting learning with this new technology, educational conceptions of a high standard is required along with quality software and suitable other materials. He focused on the following objectives (which need to be thoroughly and regularly tested): to reduce learning impediments; to eliminate deficits; to promote learning achievement; to motivate pupils; and to prevent social isolation.

6.3.4. Updating and Funding

The OECD (1989) concludes that the lack of funds for hardware often appears to force schools and education authorities to base their choice of hardware not on the educational aims they hope to achieve but on the number of computers they can buy with the limited funds available.

6.4. Factors concerning home

- The presence or absence of a computer in the home;

6.4.1. The presence or absence of a computer in the home

Loveless (1995) writes that the first 'home computers' were associated with electronic

hobbyists and developed into the entertainment and games market (pp.105,106). It is reasonable to assume that access to a home computer would give children confidence with keyboarding skills Franks (1984); Cully (1986); Moore (1987); Stracker (1989); Martin (1991); Harrison and Hay (1991). The relationship between computer skills in school and the ownership of a computer at home has been of great importance in determining the success of computer use.

However, many home computers are used for games rather than learning and the development of skills. While there may be an argument that these games improve keyboarding skills, they do not help pupils to develop techniques such as working with spreadsheets and databases. Because of the nature of the package it is more likely that word-processing software will be used in the home rather than spreadsheets or database packages.

6.6. Conclusion

Although the measurable goals in education-standard criteria for knowledge and skills about computers (or any subject) can be measured against what should be achieved at a particular age, the fact is that the long-lasting outcomes of education are more complex to measure. This is because there are various factors affecting pupils' learning (which are discussed in this chapter) such as the individual's attitudes towards learning itself or towards an object that is used in learning (such as a computer) and the individual's ability to apply what is learnt to new material.

CHAPTER 7
SCHOOL SURVEYS AND OBSERVATIONS

Chapter 7

School Surveys and Observations

7.1. Introduction

There are many different modes of instruction available to learners. However in all the schools participating in this research survey it emerged that in the none of them did pupils have the opportunities to employ a variety of methods that reflected their individual learning style and approach. It is possible that none of the various modes of instruction described may have fulfilled any one individual's personal criteria. However, for the pupils interviewed these methods are simply not available for comparison. Budgets, curriculum restraints, lack of resources and time have all taken their toll on under funded schools and harassed staff. In these circumstances it is hardly surprising that Pupils display a distinct lack of enthusiasm for a confidence in their ICT studies.

This chapter describes the work carried out prior to administering and conducting the questionnaire and the interviews In addition to giving background information about schools, pupils behaviour towards computers, the discussion described in this chapter formed the production of the pilot study questionnaires.

7.2. Background information

This section was determined by a survey schedule considering the following four headings.

- Computer modes adopted in schools;
- Organization;
- Availability of hardware;
- Assessment policies.

Having explored the different modes of instruction that may be delivered in an academic environment, it was decided to probe more deeply into the pupils and teachers' knowledge and experience of these modes with regard to answering the questions in each section. For this reason it seemed logical to discover just how much was understood concerning the various approaches, which of these modes was the most popular and the underlying reason behind this choice.

7.2.1. Computer mode(s) adopted in schools

Over the past few years the emphasis in secondary curriculum development in ICT has been on spreading computer use in the secondary school curriculum. The recommended format for educational computing in schools encourages the vocational use of ICT as a tool to unlock means of creating a good educational environment.

Schools provide different modes of computer use. Before the implementation of the National Curriculum, most schools used just two modes. Learning about computers in computer studies and learning from computers in Computer Assisted Learning (CAL)]. The 1988 Education Reforms Act (ERA) provided for the establishment of a National Curriculum (NC) for all pupils of compulsory school age in maintained schools in England and Wales including computing.

The National Curriculum, which came into force for all 5 to 16 year olds, has influenced three areas in the school concerning information technology. The statement which most usefully summarise it is the Curriculum Council for Wales (1990) as follows:

1. A cross-curricular competence;
2. Information Technology enhancing the learning process;
3. Teachers acquiring IT skills, beside their skills as teachers.

The Curriculum Council for Wales (NCC) indicated through the first statement that in addition to the areas of experience in subjects such as in Mathematics or English, there are some skills which run across the curriculum, and that ICT is one of them. Cross-curricular competence is a debatable issue for some people. While some people argue that ICT is a cross-curricular competence, others question this. Some people would view using ICT skills in Mathematics to be different than using ICT in French. The question is why are computers so important that they need to be used across the curriculum? There are two reasons for the acceptance of computers across the curriculum. These are:

- i. Helping pupils to develop positive attitudes towards computers. The concern is about those pupils who have negative attitudes toward computers. ICT competence could mean that pupils become familiar with and not afraid of computers and comfortable with such technology. In addition, through ICT competence pupils could develop a broader understanding of their uses and effects,
- ii. Helping teachers who are not using Information Technology. What is happening in schools, through the researcher's observations, does not fulfill the requirements of information technology in the national curriculum. Information and Communication Technology should be used in all subjects within the curriculum and by all teachers, but this is found problematic.

Curricular planners have attempted to increase pressures on teachers to use computers by promoting it as a cross-curricular theme. They listed ICT separately to try to encourage teachers to take account of it in their teaching and not miss it out.

7.2.2. Organization of computer use in schools

Having taken into account the strict constraints on time, resources and materials placed upon the shoulders of both pupils and teachers, it was necessary to explore just how the limited opportunities present in schools were employed in order to obtain the best value for their investors. In some schools pupils are placed in mixed ability class. The method of instruction is always through whole class teaching, in small groups and individually and whenever the pupils need help. Each school devotes a double period weekly, (2 x 45 minutes) in the timetable for ICT divided between theory and practice. The double period was a matter of school policy to reduce movement of pupils during the day and to allow theory and practice in the same lesson.

The teaching and learning of ICT in schools are of two main parts:

1. Teaching routines,
2. Providing concrete experiences in the hope those pupils will practice and develop the skills needed.

Schools have adopted three basic modes of time tabling ICT. Those are:

- a) The use of computers across the curriculum which is called ICT across the curriculum;
- b) The introduction of ICT as a subject on its own right; and
- c) The teaching of computer studies.

All the schools visited adopted the same approach in years 7 to 10. Pupils in those four years are gaining their knowledge and skills of computer use from usual every day subjects in the school curriculum. In those early years of the secondary stage pupils often master the keyboard skills, know how to use a database, and can produce stories and

reports on a word-processor with different font and sizes using desktop publishing. Of the six schools in the survey three were using ICT through all the year groups. In those three schools pupils were using ICT across the curriculum in years 7, 8, and 9 besides using ICT in special lessons and ICT as a subject on its own for years 9 10 and 11. Two were teaching computer studies across the curriculum only in years 8, 9, 10 and 11. One of the schools was not using ICT as a subject on its own. But they seemed to be using ICT in cross-curriculum subjects in the other subjects. It was in the school timetable. Pupils of year 9 and 10 use computers two periods a week. But there was no ICT teacher in the school. The technician teaches pupils how to use the computer.

ICT aims to equip pupils with the practical ability to use the machines in order to gain the skills and experiences that enable them to use computers successfully outside school. The academic organisation of ICT in many schools is not on a departmental basis like other subjects in the school curriculum. Thus the ICT co-coordinator can be chosen from any department (but usually if the head of ICT) in the school and has considerable autonomy and responsibility within the school established ICT policy.

7.2.3. Availability of hardware to pupils

One of the main problems in the use of computers in education as a whole is the availability of resources such as microcomputers. Even with the sharp reduction of hardware prices, computers are still too expensive for schools to have a small ratio of computers to pupils.

Six schools visited have a combination of different computers but one school had Acorn machines!

Of the schools visited, 6 were not only able to adopt a wider range of computers, but also the schools had a small ratio of pupils per computer. Pupils were working individually on a computer in most cases. Two pupils would be sharing one computer keyboard in some cases. Pupils were working on a basic of 1:1 (pupils per computer) in most cases, 2:1 in some cases and very rarely in large groups.

The hardware is distributed around the school in addition to having a large resource of computers. The schools have equipped the library with different numbers and types of computers for their pupils to practice computer skills. The schools have also given pupils' access to different rooms, which are usually used for the teaching of ICT courses. The access that the schools have given their pupils is during lessons, lunch hour and after school time. In addition, computers are scattered around the classrooms for using them as a tool across the curriculum.

7.2.4. Assessment policies

There are two types of assessment. The three schools that used IT as a specialist subject use the RSA CLAIT scheme. This scheme consists of continuous assessment in the basic skills of word-processing, spreadsheets, database, power point and others. The assessments are entirely practical and it is offered as a two-year course.

Whether taking ICT as a specialist subject or across the curriculum, most pupils choose to write about word-processing or databases for their assignments. Male pupils tended to choose topics such as cars, planes, football, traveling, computer firms, estate agents etc. Female pupils, on the other hand, choose softer topics. For example, they tended to write about children involved in car accidents, dating agencies, food and health, cooking,

population increase and its effects on wealth and health. When pupils were doing their assignments work, they were active in whatever they were engaged in. But it was noted that pupils did not link what they had learned during the theory work with assignments and all they apply is what they learned during the practical lessons, such as using the word-processing or spreadsheet packages. A number of teachers in those schools visited were so kind as to show pupils work for different classes.

Pupils' in the age range 14-16 year old who choose to take ICT in special lessons have to learn certain skills such as word-processing, spreadsheets and databases which can be applied to other subjects in the curriculum. The degree to which these skills are transferred, however, is open to question. The question raised is "how successful is learning such skills in other subjects within the curriculum"? For example, if pupils learnt how to use spreadsheets in special lessons are they able to use such skills in mathematics lessons and can they evaluate the activity they are engaged in and decide which skill is good for certain activity and which are better for others?

7.3. Pupils' behaviour with computers

This section was determined by observation of pupils at work using a schedule under the following four headings.

- The organization of time.
- Individual or group work;
- Pupils familiarity and confidence in computing;
- Pupils' enjoyment of computing as a subject.

7.3.1. The organization of time

Teachers usually set some exercises for pupils to do and when they are finished they move to the next set of exercises. They usually had their work printed out, so they can find their mistakes. When the pupils finish the task required, their teacher tests them on their knowledge and skills. This is done by testing them from past examination papers or by specific tasks that teachers have set. If the teacher is satisfied that these pupils have mastered the skills then s/he moves them to the next task. Sometimes where more able pupils finished earlier, the teacher starts the new task with them alone.

The mean number of hours allocated to the teaching of computers is 1.93 hours a week (see table 7). On average boys use computers 2.09 hours and girls 1.77 hours per week. In some subjects teachers used a lot more discussion or group work when they are doing theoretical work such as in History and Geography lessons. The question that is raised in the researcher's mind is "why do ICT teachers go for this kind of passive mode of learning when in the rest of the school this is not necessarily the case?" In answering this question the researcher felt while she was observing that ICT teachers choose the passive mode to teach their pupils in order to finish what they have to pass to them and then allow their pupils to do more practice on the machines. This in turn suggests that teachers were not excited about the material they have to teach nor were their pupils. If this is true and teachers did not find the theory work interesting to teach then there is a good chance that pupils do not find it interesting to learn. As one of the teachers shouted to her pupils,

"Only do what you are told to do".

Another teacher in an other school commented:

"There is only one of me and about 32 of you. So please be quiet [One said Shut up] and just let me finish what I have to do and then go to practice".

During the practice lessons such as in word-processing, pupils were using a booklet containing different exercises to allow them to develop the needed skills step by step. Those exercises were not intellectually challenging. Pupils do not have to think about them. They were only having to repeat steps with new requirements. Pupils just needed adequate time and resources to master the needed skills. In the classes visited, pupils were only practicing the type of texts which were meaningful for them. Pupils were not learning anything other than ICT skills.

7.3.2. Individual or group work

- i. Do pupils work individually or in groups?
- ii. If more than one pupil is using a computer, how do they organize their own sharing of the computer keyboard?
- iii. Are they competitive or co-operative in working on their tasks?

In schools the number of pupils in each class varies between 20 and 35. There is not a wide range in the availability of computers in all the schools. But schools arrange their timetable so that each pupil (especially in year 9, 10 and 11) get a chance to use computers in the class in groups or individually. Boys either worked alone or with other boys. In some cases a boy and a girl worked together on the machine. From the researcher's observations it appeared that both girls and boys were equally competent with the computer use. When two pupils shared a computer they usually organised their own time on the keyboard. Work was either saved on one joint disc or on two discs. The researcher was impressed by the way pupils operated in their work, when they were allowed to work by themselves or in their own way, and beyond the interference of instructions.

It was also observed that pupils working within the group not only encouraged each other by talking, making decisions and sharing ideas but also helped other pupils within different groups. Although group work has been of benefit to pupils within the group, the limited time available for each group to finish the task required has been a problem for some. Most of the pupils liked to work at their own pace. This depended on the ability of pupils within the group. The very able and the able within the group mostly finished the task within the time available for them. Less able pupils, on the other hand, have some problems with time. When pupils share computers they either had to wait to do the task in the following week or do it in their free time during the break, in the middle of the school day or after school either in the computer club or the school library.

Pupils who sit individually on the computer and work alone seem to be more confident in carrying out the task because they are forced to depend on themselves. These types of pupils were open, would talk to the researcher and express their opinions freely. In one case the researcher asked a girl sitting alone at the computer if she minded being joined with another girl to work with. She replied by saying “although I prefer to work alone, I do not mind it at all”. Then she started showing the researcher her work on PowerPoint. At the end of the talk, she said “I like working with computers very much. When I finish school, I am going to specialise in computers”.

The researcher also observed a group of pupils appeared less confident with using PCs. Some pupils who were slow to finish the task belonged to this group. The researcher tried to get a deeper understanding of their attitude through informal interviews and found that this type of pupil was too shy to answer questions or show the teacher or other pupils in the class that they did not understand details of the task requirement. The reason they

gave is that they did not want anyone to think of them as “dumb” pupils and they did not want to feel that they could not compete with their classmates. For these learners the barriers to learning may be more “societal” than “intellectual”. Learning may also be impeded by resulting inappropriate or immature behaviour, dependency or acquiescence, or a strong tendency to cling to familiar individuals (pupils or staff). This may also be accompanied by low self-expectations. The need to unlearn can often be the biggest barrier to learning new skills. This fact was common in the classes observed, although all the teachers were found to be encouraging and always asked pupils to raise their hand if they did not understand any point. Pupils’ work in all the schools in the survey tended to be a combination between co-operative, competitive and individualized type.

Deutsch (1962) and Johnson and Johnson (1975) mentioned that in a co-operative learning situation, when one pupil achieves his or her goal, all others with whom he or she is co-operating achieve their goals. This is because in cooperative situations, communication amongst pupils tends to be frequent, open, accurate, and effective. In a competitive learning situation, when one pupil achieves his or her goal, all others with whom he or she is competing fail to achieve their goals. This is due to the fact that in competitive situation communication among pupils tends to be infrequent, closed, inaccurate and ineffective. It was found that there was a combination of co-operative, competitive and individualistic learning situations.

7.3.3. Pupils’ familiarity and confidence in computing

Pupils were working from exercise booklets when they were doing the skills practice. Pupils usually print their work and keep this in their files. Teachers mark pupils’ work and write their comments and suggestions for each pupil. When the pupils finish the task

required they move to the next one. Pupils' work was all kept in one file together with the booklet to remind them of their tasks. Teachers usually give instructions on the board, or they write them on sheets which are distributed to the pupils. Some use the overhead projector in the class.

Pupils in the schools visited showed that not all of them could handle information stored in the database confidently. Some can locate information stored in a database, retrieve it, and add to it. They can develop, organize and present ideas in a variety of forms using word-processor spread sheets, PowerPoint or Publisher. In all of the schools visited pupils produced the leaflets using publisher and presentation slides, using power point in a very neat and attractive way. They could illustrate findings by pictures, graphs and charts. Different pupils mentioned they could find different information about different topics. Pupils understood how to use the packages very well. Through observation it appears that pupils are familiar with the hardware. Pupils at the start can set up the computer, connect the monitor, and choose which disc drive to use and set the printer to print their work. They can switch on, insert a disc and run a program. In addition, they can handle discs safely to avoid damage, retrieve information, copy a Programme and finish work carefully.

7.3.4. Pupils' enjoyment of computing as a subject

Most of the pupils on the whole expressed negative attitudes towards computers; even if they do not get much time in schools working with them. They expressed their views that this technology is a great innovation and it is getting more and more important to society and individuals. They said that they wished to learn more about them and they will continue using them in the future. Most of the pupils in all the schools that the researcher

observed wanted to learn more about computers but they were not happy about the time they get to use computers in school.

It was observed that pupils are allowed to use computers in their free time as well in the lessons. They were able to handle information in a more confident way. Longworth (1981) supported this point of view. Competence with a variety of new machines and applications is a skill which will become more useful as those children enter the world of work, in which information will be dispensed to those who know how to gain access to it.

7.4. Conclusion

In three schools there were two modes of computer use; as a specialist subject ICT and ICT across the curriculum. They also implemented three types of teaching and learning modes i.e. learning about, learning from and learning with computers. Two were implementing the ICT as optional courses across the other subjects for pupils age 14-16. One of the schools was not using ICT as a subject on its own. But they seem to be using ICT in cross-curriculum subjects in the other subjects. It was in the school timetable. The computer studies syllabus is under development all the time. The new syllabus concentrates on the practice of the skills rather than the theory. Pupils follow exercise booklets to guide them on what they did before and what to do next. All their work printed out and kept in a file of their own computer use is a combination between cooperative, competitive and individualistic types. Computer club attendees are mostly average and above average pupils. They are not allowed to work on their own speed and pace.

CHAPTER 8

**TEACHING THE USE OF COMPUTERS AND USING
COMPUTERS IN TEACHING**

Chapter 8

Teaching the use of computers and using computers in teaching

8.1. Introduction and overview of the empirical evidence

Analysis of the information gathered thus far suggests the possibility that ICT has still not been fully integrated into schools and does not support pupils' learning strategies in the manner in which it was hoped. It could be that a full and complete overhaul of teaching and learning styles would be necessary in order to bring about the integration of ICT into schools. Effective teaching and learning strategies for ICT require planning, monitoring and evaluation in those schools where pupils are able to access ICT.

We need to question whether pupils do not experience the kind of stimulating learning environment which makes learning an enjoyable, interesting and pleasurable experience in school and whether the schools themselves offer the potential to use ICT to optimum effect. In this study, pupils' attitudes towards using the computer and their reactions to learning from and working with computers in schools are examined in. Attitudes concerning the availability and usage of home computers were also taken into consideration but are not at the centre of the study.

In this part of the research the theoretical and practical experience of using computers, especially in school will be addressed. Attitudinal questions were asked about learners' perceptions and experience, including the amount of time spent in using computers, the precise use and subject of that usage and whether or not the user has found the experience pleasurable.

The crux is to determine, through qualitative and quantitative data, attitudes towards ICT and the relationship between the computer and the user in the school environment. The question is whether if the computer is viewed as a valid instrument and if so whether it is perceived as a predominantly educational instrument or as an instrument that is transportable and compatible to other environments. From the interviews it is seen that pupils express a difference in attitudes towards the home and school computer. They appreciate the potential that computer offers for accessing information but value it as an apparatus they can use more comfortably at home.

As demonstrated by the quantitative and qualitative data gathered in the study and the statistical evidence concerning pupils' attitudes towards the use of computers within schools a number of factors have come into focus. All pupils participating in this survey have expressed negative attitudes towards the use of computers in school. Pupils do not appear to have much time available to them in which they have access to a computer. When they do it is to meet basic subject requirements and little else.

The quantitative research surprisingly reveals that pupils do not particularly enjoy using computers. They do not find them to be either useful or important. Those pupils who do work hard to improve their ICT skills do so with the aim of employing those skills in the workplace. They are preparing for a future in a highly competitive labour market –those candidates with the greatest skills base to offer stand the most chance of securing the more lucrative avenues of employment.

From the comments gathered from pupils through the quantitative data the researcher decided to incorporate further questions in order to probe pupils' attitudes regarding

school in general. Many schools are currently under attack regarding the success or otherwise of incorporating ICT into the modern curriculum. Questions are being raised in the public media and central government concerning the overall quality of standards of education that pupils are receiving.

In the interviews the intention was to identify pupils' attitudes, explore school culture and gain a further insight into pupils' experience of schools. In addition to the data gained through the quantitative study reported in the previous section, the researcher included a qualitative study designed to obtain further evidence about pupils' attitudes towards computers and schools. How do they spend their time in school? Why do they come to school? What is school for? What do they do most of the time in school? How much time do they spend working in school? What are their experiences in school? The reason for choosing this qualitative approach is its proven effectiveness, especially when dealing with human attitudes and behaviour which requires careful consideration and deeper understanding.

Variations emerged in the ways that pupils responded to the interview questions. Pupil attitudes and behaviours change in the light of their needs. Schools need to be able to draw on historical, psychological, philosophical and sociological abilities of pupils in order to create the new pedagogical changes in their behaviour and attitudes and according to their perceptions about schools.

For the purpose of the qualitative research, the collection of data was arranged in different types of school (e.g. socio-economically rich, middle and poor schools) concerning pupils' attitudes towards both computers and schools. The interview sample

comprised 16 girls and 13 boys. Pupils' opinions and comments in all the different schools were sought in order to discuss their general attitudes towards schools and computers.

8.2. The use of computers in teaching

The first question asked is the straightforward one about the use of computers in schools. The results in table 5 show all of the 310 (100%) pupils, regardless of gender, in year 9 and 10 reported that they use computers in school. The result of this question is consistent to the pilot study questionnaire results. It is now fairly well established that all schools have computers. The question remains whether the access to computers is adequate.

Table 5

Do you use computers in school?

Year	Gender			
	Male		Female	
	Frequency	Percentage	Frequency	Percentage
Year. 9	78	51.0%	78	49.7%
Year.10	75	49.0%	79	50.3%
Total	153	100.0%	157	100.0%

The present research found that the number of computers per school ranges from 90-278. The pupils in years 9 and 10 can get an opportunity once a week, for approximately one hour in the formal classroom, to use the computer as a discrete subject and they also get the chance to use the computer individually.

In the following tables (quantitative results) and interviews (qualitative results) we can plainly see that the vast majority of pupils possess home equipment which is demonstrably superior to that found in schools. By comparison some of the equipment

provided by their school is out of date, of dubious quality, cumbersome and slow in its activities and calculations.

8.3. Types of computers used in the school

It is an often repeated assertion that in education new technology overtakes the old. New technology also provides more and more powerful ways to create, store, select, process, deliver and display information. There is a continuous development of microcomputers with a wide range of applications and potential users in the field of education. Different types of microcomputers are used in schools and every school is getting more up to date computers.

It is clear from the NGfL policy that schools should be better equipped with upgraded and developed ICT and that they should be connected to the superhighway, free of cost.

The first interrogation is whether the promises have been fulfilled in their own terms.

The table 6) shows that of the 81.0% pupils said they use PC Windows, 12.6% said they use Acorn, and 12.9% said they use Macintosh.

Table 6

What type of computers do you use in school?

Types of computer	Frequency	Percentage
PC (Windows)	Of the 310 (251)	81.0%
Acorn	Of the 310 (39)	12.6%
Macintosh	Of the 310 (40)	12.9%

Results showed that there are still some schools who use the older computers. These schools cannot be connected on line. They do not have powerful enough computers. The children in these schools cannot get access to the most recent information. These children will remain disadvantaged when compared to other school children that have the new and more powerful computers.

In this part of the research the main concern is simply with the time devoted to the engagement with computers. From previous literature it is found there is much emphasis on the use of computers in a variety of ways in schools. Different schools use it in different modes of studies. Not much evidence has been found from previous research how much time is available/allocated/allowed for pupils to use the computers in school.

The concept of time has many applications according to which reality one is obliged to inhabit. 1.93 hours per week of dedicated computer time for example will have a very different impact upon a pupil who has access to the latest technology and an obliging, knowledgeable tutor rather than for the pupil who struggles with antiquated equipment and little or no assistance close to hand. The time wasted in booting up, waiting for systems to begin and finish processing, combined with alarming “crashes” and the risk of virus infection deliver a vastly different amount of “quality time” to such disadvantaged pupils. In addition the ratio of pupils to each computer will reduce this time still further.

No policy has been introduced by the government as to how many hours computers should be taught as a separate subject or should be used in other subjects in schools. The UK Government introduced the National Grid for Learning and a commitment by the government that all schools should be better equipped and also be connected to the online. However the increased usage and integration of computers into everyday life would appear to have come about via home computing rather than in any academic context. The technology in schools was limited until the new National Grid for Learning was introduced.

Time itself is a variant commodity which is perceived differently by individuals even when in the process of sharing common experiences. Because of this difference in perception it was vital to compare as many experiences as possible in order to identify any common factors or perceptions.

DFE (1995) stated that at Key Stage 3 pupils should be taught to become critical and largely autonomous users of Information Technology, aware of the ways in which Information Technology tools and information sources can help them in their work. They were to understand the limitations of such tools and of the results they produce; and use the concepts associated with Information Technology systems and software and the associated technical terms (p4). DES report stated in 1989 that

“Secondary schools need to identify what pupils from different primary schools have learned so as to complement and build upon their previous Information and Communication Technology (ICT) experience. Learning across the curriculum should continue to be enriched through ICT. ICT in the secondary curriculum does not presuppose any particular form of organisation. (p.12)

Some schools were already moving towards the teaching of it through different subjects of the curriculum rather than as a separate subject study. Others chose to provide specific computer awareness courses, mainly for pupils aged 11-13, a strategy which can be effective when courses are differentiated, fairly brief and especially when designed to build on pupils' experience of ICT in primary school. This may allow the teacher of English, for example, to assume that pupils have already been taught something about the elements of word processing. It is arguable, however, that these skills would be better developed from application within the programme of work in English. Many schools operate a mixture of the two approaches.

All these modes of computer could be available in schools. Some schools provide a mixture of two modes of computer study and in some schools computers are used to support other study subjects or taught as a subject on its own. However, in some schools computers are used not for academic purposes at all. Given the small quantities of time and resources it is hardly surprising that ICT may not be a “stand alone” option for many smaller schools. It was observed that in one of the schools pupils do use computers but not in any subject or as a discrete subject. Old computers are used solely for recreational purposes (i.e. games) without any trained ICT supervision. The ICT technician tells them how to turn the computers on and off and that is the extent of his input. In this situation it is hard for pupils to become ICT literate?

The different use of computers in schools depends on many factors:

- The number of machines available;
- The availability of time;
- The time spent in the subject;
- The training of Information Communication Technology teachers;
- The pupil interest in the subject;
- The pupils’ prior knowledge of use of computers (both teachers and pupils);
- The quality of software and courseware;
- The socio-economic background of pupils.

8.4. Time available for the use of computers in schools

The first question regarding length of time was asked in order to ascertain how many hours on average they use the computers in schools. This was in order to compare the policy of successive governments to incorporate and implement IT studies into the body of schools policies with the actual level of integrated activities taking place. It will be seen that far from achieving this social blueprint for the future (IT literate pupils and functional equipment), the reality is at odds with the original intention.

Results in table 7 show that 46.8% reported that they use computers in school for 1 hour, 31.0% reported 2 hours, 11.6% responded 3 hours, 3.5% said 4 hours and 7.1% said 5 hours a week. The mean number of hours computer used by every pupil per week is 1.93 regardless of gender.

When one considers all the factors involved, 1.93 hours of designated time per week is nowhere near approaching a reasonable time period for informed learning to occur. The school body itself may be unhappy with this limited resource but may be unable to incorporate further studies into present curricula due to deficiencies in the budget or shortage of experienced/enthusiastic staff. Many schools are dependent on donations of ICT equipment, many of which come from pupils' parents who have replaced home equipment with updated technology. There is therefore surprise that donated items tend to be of limited capacity when compared to those available on the present market. If the school itself does not portray ICT as an important subject it is quite understandable that the pupil body judges by appearance and follows the same assumption.

Table 7

On average for how "many hours per week" do you usually use computers in school?

Categories	Gender						Total of the sample		Mean no. of hours per week.
	Boys			Girls			(f) Of the (310)	(P) (%)	
	Frequency Of the (153)	Percentage (%)	Average	Frequency Of the (157)	Percentage (%)	Average			
"1 hour"	65	42.5%	2.09	80	51.0%	1.77	145	46.8%	1.93
"2 hours"	49	32.0%		47	29.9%		96	31.0%	
"3 hours"	16	10.5%		20	12.7%		36	11.6%	
"4 hours"	5	3.3%		6	3.8%		11	3.5%	
"5 hours"	18	11.8%		4	2.5%		22	7.1%	
Total	153	100.0%		157	100.0%		310	100.0%	

(f): - Frequency; (P): -Percentage

As shown in table 7 there is a gender difference of time of using computers in school. Of the total sample 42.5% boys and 51.0% girls responded to 1 hour a week. For 2 hours virtually no gender difference is found. Slightly more boys (32%) than girls (29.9%) responded to this. A small number of the pupils reported the use of computers three hours per week. Slightly more girls (12.7%) than boys (10.5%) answered this. A very small number of pupils said that they use computers in schools for 4 hours. A big gender difference is found when pupils were asked about 5 hours a week. More boys (11.8%) and fewer girls (3.8%) said that they use computers in school for five hours a week. There is also a marked difference in the average number of hours computers are used in school per week by boys and girls (boys 2.07% and girls 1.76%).

It is not enough just to know the amount of time available to the pupils in school; we also want to know when and they can use them. Do they use computers in ICT courses, across

the curriculum, playing games, using the Internet, e-mail, in computer clubs, library, in or between lessons or after school. Where and how do they make the use of their time in using computers in school? Do they use Information Communication Technology in school as a discrete subject, or embedded in other subjects. How many lessons do they have and how much time they spend on them every week.

As Wellington (1988) found, one London school introduced computer education as part of its pastoral curriculum. Over five years each pupil had a total of 28 one hour lessons covering computer aided design, word processing, the computer as a learning aid, computer models, electronic music and databases. Time factor influences learning in general and learning about computers in particular.

8.5. The use of computers in schools as a separate subject and across the curriculum

The changes required by the National Curriculum were initiated at government level. The Government (DES/WO, 1981) has argued that:

“The quality of our pupils’ education depends mainly on three factors: The quality of teaching, the resources available, and the curriculum. All three factors are connected”. (p.1)

The initial National Curriculum Consultation Document published in July 1987 named English, Mathematics, Science, Modern Foreign Language, Technology, History, Geography, Art, Music, and Physical Education, as the ten foundation subjects which (apart from the modern language) all pupils should study through out their compulsory schooling (p6).

This raised the question of whether ICT should be regarded as a subject or a theme? The same document suggested that “there are a number of subjects or themes such as health education and use of information technology, which can be taught through other subjects” (DES/WO, 1987; p.88). It emerged at a later time that there were five cross-curricular themes (Economic and Industrial Understanding, Health Education, Careers Education and Guidance, Education and Citizenship, Environment Education) to be taught in addition to the foundation subjects. Technology itself subsequently became unique within the National Curriculum by being sub divided within its Statutory Order (DES/WO, 1990) into two components: Information Technology and Design & Technology.

8.6. The Use of the computer as a separate subject in school

As mentioned earlier, different schools use different modes of computer study for different reasons (i.e. lack of resources, lack trained ICT teachers). The next item in the questionnaire was deliberately asked about whether or not they use the computers in the school as a discrete subject. Results in table (8) show that 73.5% said that they use computers in the school as a separate subject.

Table 8

Do you study ICT as a separate subject in school?

Categories	Frequency Of the (310)	Percentage (%)
Yes	228	73.5%
No	82	26.5%
Total	310	100.0%

As shown in following table (9) 65.2% said that they get “one lesson” of ICT as a separate subject. 8.4% responded to “two lessons” a week.

Table 9 shows that 26.5% pupils responded to “none”, indicating that they do not receive any lesson of ICT as a separate subject in the school. Some schools do not offer ICT as a separate subject at all. A single lesson per week is hardly an example of integrating the study of ICT into the core values of modern education.

Table 9

How many ICT subject lessons you have in school every week?

Categories	Gender				Total of the sample	
	Boys		Girls		Frequency Of the (153)	Percentage (%)
	Frequency Of the (153)	Percentage (%)	Frequency Of the (153)	Percentage (%)		
“One lesson”	100	65.4%	102	65.0%	202	65.2%
“Two lessons”	12	7.8%	14	8.9%	26	8.4%
“None”	41	26.8%	41	26.1%	82	26.5%
Total	153	100.0%	157	100.0%	310	100.0%

There would appear to be a consensus amongst pupils regarding this question. No gender difference is found for the responses of this item. Approximately the same percentage of both boys (65.4%) and girls (65.0%) responded to the “one lesson a week” and 1 percent more girls (8.9%) than boys (7.8%) replied to two ICT lessons per week. In order to make sure of the validity of the results the same question was asked in different ways, (i.e. how many hours do they use the computer as a discrete subject or for its own sake)?

The data in table 10 demonstrates a not insignificant finding regarding the number of hours perceived to be allocated to ICT. No less than 26.8% believe that they are not experiencing any studies at all! This might not be an accurate portrayal of their learning pattern but it is an account of their own perception. This is an experience that might be true of less able pupils, or those who are insufficiently motivated to push ahead to the front of the queue for the best equipment.

As shown in the following table (10) 57.4% of the total sample replied up to 1 hour a week. Only 15.8% pupils replied between 1 and 2 hours per week and 26.8% said they did not use computers in school as a discrete subject at all. The results of the above two tables demonstrate this. To further clarify how pupils perceive designated computer studies and “integrated” computer studies (i.e. as in performing a role to support other classroom studies and subjects) it was necessary to ask questions in specific areas. Many pupils participating in this research appeared reluctant to commit themselves to specific data regarding time and quality. There also appeared to be some confusion regarding whether or not the use of a computer was regarded as an ICT lesson in itself, irrespective of whether it featured in another teacher’s lesson. In order to minimise anomalies the researcher returned to this area several times throughout the survey.

Table 10

How many hours do you do ICT as a separate subject in school every week?

Categories	Gender				Total	
	Male		Female		Frequency Of the (310)	Percentage (%)
	Frequency Of the (153)	Percentage (%)	Frequency Of the (157)	Percentage (%)		
“Not at all”	42	27.5%	41	26.1%	83	26.8%
“Up to 1 hour”	87	56.9%	91	58.0%	178	57.4%
“Between 1 & 2 hours”	24	15.7%	25	15.9%	49	15.8%
Total	153	100.0%	157	100.0%	310	100.0%

Results show the amount of time spent using computers for different activities (e.g. the use of computer for its own sake, in different subject studies or for different computer courses) has increased compared to the findings of Wellington mentioned previously. He found that over five years pupils get only 28 lessons for different computer activities. There is more time available for different computer activities in schools, more recently.

8.7. Use of computers in the cross curriculum subjects

In school, computers are also used in other subjects or for other activities (e.g. using Internet, e-mail). Pupils were asked for how long they use computers in schools outside the ICT lessons.

Table 11

Do you use computers in subjects other than ICT?

Categories	Gender				Total of the sample	
	Boys		Girls		Frequency Of the (310)	Percentage (%)
	Frequency Of the (153)	Percentage (%)	Frequency Of the (157)	Percentage (%)		
Yes	136	88.9%	142	90.4%	278	89.7%

In the above table (11) 89.7% pupils responded to the item in which they were asked about use of computers outside ICT lessons. The researcher was intent on defining not only the amount of activity but also such factors as access, location and time available for pupils' use as well as establishing how they used ICT. To this extent the computers had become less separate from the curriculum as a whole.

Table 12

How long do you use computers outside ICT lessons per week in school?

Categories	Gender				Total of the sample	
	Boys		Girls		Frequency Of the (310)	Percentage (%)
	Frequency Of the (153)	Percentage (%)	Frequency Of the (157)	Percentage (%)		
"Not at all"	39	25.5%	56	35.7%	95	30.6%
"Up to 1 hour"	42	27.5%	56	35.7%	98	31.6%
"Between 1 & 2 hours"	24	15.7%	20	12.7%	44	14.2%
"Between 2 & 3 hours"	16	10.5%	14	8.9%	30	9.7%
"Between 3 & 4 hours"	4	2.6%	2	1.3%	6	1.9%
"Between 4 & 5 hours"	28	18.3%	9	5.7%	37	11.9%
Total	153	100.0%	157	100.0%	310	100.0%

In table 12 pupils (30.6%) answered that outside ICT lessons in school they use computers “not at all”. Approximately the same number of pupils (98) said that outside ICT lessons they use computers for up to “1 hour”. Only 14.2% responded to “between 1 and 2 hours” and a small number (30) of pupils replied to “between 2 and 3 hours”. There was, however, a cohort 37 who replied to between 4 & 5 hours per week.

It will be observed that there appear to be some discrepancies in pupil responses. This can be explained. Many pupils appear to have difficulties in separating “perceived” time ratio and “actual” time ratios. This is an occurrence that will present itself later in the survey in respect to other areas of interest. In this particular area of the survey it will be observed that the greatest difficulty is for pupils to assess the time spent using computers in other subjects. There are many reasons why this should be, like distraction of friends, the waiting time for the computer or lack of competence.

A number of surveys have examined the effects of Information and Communication Technology on pupils’ performance levels in other subjects e.g. English, Mathematics, and Science. The studies show a positive effect of Information Communication Technology on learning in these subject areas. The Impact study (Cox 1993) was the first large scale and longitudinal investigation, commissioned by the UK Department for Education, to evaluate the impact of Information Technology on children’s achievements in English, Mathematics, Science and Geography for pupils aged 8-10, 12-14 and 14-16 years. The sample of 2,300 pupils for this study was drawn from 87 classes. These pupils came from matched pairs of classes. One of each pair was also identified as making regular use of Information Technology and designated the High Information Technology

Group, and the other as the Low Information Technology Group. The pupils divided into 12 cells over four curriculum areas.

The experimental research was divided into three substantial parts. In the first part an assessment of pupil's achievements of specific learning tasks and skills was carried out. These assessments were supplemented by topic-specific mini-studies in some High Information Technology classes and a final test for Information Technology concepts and skills. In the second part pupils and teachers were questioned to provide illumination of classroom realities. In the third and final part Information Technology resourcing and use was monitored throughout by the regular return of questionnaires and data sheets from the teachers and pupils in each class.

The result showed that there was a positive impact of Information Communication Technology on children's learning in terms of interest and accessibility but this impact was not consistent across subjects or age groups. The overall effect on reasoning in subjects, (e.g. by subjects combined), was also significant in favour of the High Information Technology Group.

The mean success rate on pupils' examination was 52.8% by the High Information Technology Group compared with 47.2% by the Low Information Technology Group. The study concluded that only those classes of pupils that had regular and sustained use of Information Technology in the subjects showed marked evidence of an improvement in learning. However it did not make clear whether the element of pupil choice in the use of ICT was taken into consideration.

This study proved that use of computers across subjects can significantly affect the pupils' achievements positively. As mentioned earlier, Bork (1985) intimated that computers would be used at all levels and in all subjects by 2000. The researcher wished to determine if pupils are allowed to use computers across other subjects and if so then in which subjects in schools. The subject choices of pupils are summarised in tables. The impression given by the data is of a wide range of subjects. To what extent these integrate the use of ICT into their subjects remains to be seen.

8.8. English and Mathematics

Table 11 shows that 89.7% pupils use computers in subjects other than Information Communication Technology. (The researcher's first question was about two core curriculum subjects of English and Mathematics). Table 13 shows that 59.7% pupils said they use computers in English in school. In pilot interviews it transpired that pupils use computers in English for writing essays and stories.

However not all pupils prefer to use the computer for producing work. Less computer literate pupils may feel more confident using the traditional pen and/or pencil to communicate their ideas.

Table 13

Do you use computers in English and Mathematics in school?

Categories	Gender				Total of the sample	
	Boys		Girls			
	Frequency Of the (153)	Percentage (%)	Frequency Of the (157)	Percentage (%)	Frequency Of the (310)	Percentage (%)
English	90	58.8%	95	60.5%	185	59.5 %
Mathematics	94	61.4%	78	49.7%	172	55.5%

(In 1980 the DES conducted a study and a remarkable difference was found in the use of computers in English i.e. 46% boys and 54% girls (Culley 1986 p12-13). The percentage of girls using computers in English is still higher but the gap is reducing).

Table 13 shows that only 55.5% of pupils use computers in Mathematics. This is hardly surprising as Mathematics is essentially an exercise in intellectual and mental discipline which exists without the need for an electronic reality. There is also a significant gender difference in using computers in mathematics i.e. more boys (61.4%) and fewer girls (49.7%).

A number of research studies have been carried out about how pupils improve their performance when they use computers in mathematics. Reglin (1989-1990) compared computer instruction in mathematics to traditional instruction in mathematics. One group of pupils were given nine hours of computer-assisted instruction; and nine hours of classroom instruction, the other group were given 18 hours of classroom instruction. Pupils in the classroom instruction plus computer assisted instruction group showed significantly higher achievement gains than the pupils in the classroom instruction only group.

8.9. Science subjects (Chemistry, Physics and Biology)

In this part of the question the researcher's aim was to know what are the advantages in using computers within the science subjects is it true that:

- Pupils can measure and control scientific processes, using Information Technology where appropriate;

- Pupils may have a greater vocabulary of terms; learn more about the every day use of Information Technology system and how to communicate with their environment in a more effective manner.
- Pupils can understand the common components of Information technology;
- Pupils can explore the computer based simulations of process;
- Pupils can also learn to use the computer to store and retrieve scientific data as appropriate.

As mentioned by Frost (1997), the use of software is of major benefit in both the teaching and learning of science. This is based on the views of practising teachers and various research reports on the factors affecting the usefulness of available software. Science pupils can use a CD-ROM or the Internet to research the up-to-date work of scientists. They can pick up facts and pictures from reference sources such as computer encyclopaedias. They can express their ideas and explain them using models with spreadsheets, or model building software and can take readings using data-loggers (In Mumtaz ;2000, p29).

The same question was asked for separate science subjects and the researcher found very different results from the overall response towards the use of computers in science subjects.

Table 14

Do you use computers in Chemistry, Physics and Biology in school?

Categories	Gender				Total of the sample	
	Boys		Girls		Frequency Of the (310)	Percentage (%)
	Frequency Of the (153)	Percentage (%)	Frequency Of the (157)	Percentage (%)		
Chemistry	42	27.5%	26	16.6%	68	21.9%
Physics	41	26.8%	22	14.0%	63	20.3%
Biology	38	24.8%	21	13.4%	59	19.0%

21.9% responded positively to the use of computers in Chemistry, 20.3% in Physics and 19% in Biology. A big gender difference is found in all these subjects. In all the above subjects the percentage of pupils using computers is approximately double that of boys to girls.

The results of the present study are not consistent with the results found by Logan (1988, p133).

Subjects	Overall%	Boys (%)	Girls (%)
Chemistry	41.5	46	32
Physics	60.2	77	29
Biology	37.6	28	60

In his study Logan (1988) found that the boys and girls reported that they have some experience of using a computer in these subjects, almost double for Chemistry, Biology and treble in Physics than the percentage found in the present study. The present research suggests that instead of increasing the use of computers in these subjects is decreasing.

Changes in government directives regarding school curricula and the return to an emphasis on “practical” skills might have triggered a downturn in the delivery of Science subjects across the UK.

8.10. The use of computers in Design and Technology, Business Studies, (DT)

Textile and (DT) Food

The following choice of subjects were Design and Technology, Business studies, (DT) Textile and (DT) food. These subjects were included in the National Curriculum to encourage young people to have the vision to combine enterprise, initiative and imagination together with knowledge and skills. NCC (1989) presented in the Curriculum

Guidance 2 report that knowledge of technology enables citizens to be prepared to meet the needs of the 21st century and to cope with a rapidly changing society.

In Business Studies teaching pupils were taught to learn typing and shorthand skills with an aspect of technical and vocational education that featured in the curriculum of many state schools. By the mid 1980s, Business Studies (BS) had de facto become involved with Technology, although in two completely different ways.

- The development of computer systems had moved the departments away from shorthand and typing into information systems;
- Business studies departments teach the syllabuses that include the use of technology as an activity happening in the industrial and business context.

Penfold (1988) locates the rise in this subject in the period 1973-1986, although he points out that “The Education Year Book 1983 revealed “as bewildering a range of names (for examination courses) as in 1883” (Penfold, 1988; p23). Boulter (1989) in the qualitative part of his research found that many of his respondents thought that Technology should be taught across the curriculum. He also stated that:

“Technology should be an integral with all subjects-not taught as a stand alone topic”. (Boulter 1989; p.143)

The present research results in the following table (15) shows that approximately half of the pupils (48.7%) responded that they have experience of using computers in schools in Design & Technology.

Table 15

**Do you use computers in Design & Technology, Business Studies DT Textile and
DT Food in school?**

Categories	Gender				Total of the sample	
	Boys		Girls			
	Frequency Of the (153)	Percentage (%)	Frequency Of the (157)	Percentage (%)	Frequency Of the (310)	Percentage (%)
Design & Technology	81	52.9%	70	44.6%	151	48.7%
Business Study	40	26.1%	26	16.6%	66	21.3%
DT Textile	34	22.2%	29	18.5%	63	20.3%
DT Food	35	22.9%	28	17.8%	63	20.3%

Table 15 shows that the gender gaps for Design & Technology are small. Slightly more boys (52.9%) than girls (44.6%) responded positively. Though the percentage of using Computers in Design & Technology is increasing it is still small when it is considered that Design & Technology is central in today's school curriculum.

Business Studies is taught in different ways from before, and computers should be central in this subject. However, the percentage of the pupils who use computers in Business Studies is still very low. In table 15 the researcher found that only 21.3% pupils responded that they use computers in Business Studies. There is also a gender gap. 26.1% of boys and 16.6% of girls responded that they use computers in school in Business Studies. An equal percentage of pupils in (DT Textiles and DT Food), said that they use Information Technology in these subjects. There is a gender gap in the use of computers in both subjects. More boys (22.9%) than girls (17.8%) said that they use a computer in DT Textile and DT Food.

8.11. The use of computers in Geography, History and Physical Education

It is stated in the HMI Series Department of Education and Science (DES) (1989) that the use of computers in Geography & History enables the pupils to:

- Measure phenomenon in the environment (using directly or remotely sensed output);
- Explore computer based simulation of geographical phenomenon;
- Access, retrieve, evaluate, interpret historical, political, social and economic information from various sources, including computer databases;
- Explore historical concepts via computer simulation;
- Determine and comment on physical fitness, using computers with suitable sensor to measure and analyse physical performance data, e.g. rates of heartbeat or breathing

(HMI Series Department of Education and Science 1989; p.46).

The importance placed on the use of computers in History, Geography, Physical Education and Religious Education is not translated into action in schools as shown in the following table (16).

Table 16

Do you use computers in History, Geography, Physical Education and Religious Education in school?

Categories	Gender				Total of the sample	
	Boys		Girls		Frequency Of the (310)	Percentage (%)
	Frequency Of the (153)	Percentage (%)	Frequency Of the (157)	Percentage (%)		
History	53	34.6%	50	31.8%	103	33.2%
Geography	48	31.4%	38	24.2%	86	27.7%
Physical Education	17	11.1%	7	4.5%	24	7.7%
Religious Education	37	24.2%	42	26.8%	79	25.5%

It would appear that despite the Department of Education and Science's hope of integrated computer use in these subjects, the implementation of these activities has been less than satisfactory.

8.12. The use of computers in Art, Music and Modern Languages

The Department of Education and Science (1989) states that by using computers in modern languages pupils should be able to:

- Use IT with discrimination to compose, manipulate, refine and produce music of quality;
- Generate sounds for creative development;
- Use various forms of text handling, from authoring programmes, where input is controlled by the teachers, through free composition using word processors to desktop publishing;
- Use IT to communicate with remote partners in the UK and abroad, e.g. via the exchange of audio or video recordings, electronic mail or satellite programmes;
- Explore programmes such as computer simulations, interactive video and databases, which provide scope for discussion and decision-making.

(HMI Series Department of Education and Science 1989 p.48)

This is an ambitious proposal in respect of both resources and budget. A significant amount of research has been done concerning the use of computers in modern languages. Preference is shown on the part of the girls. Culley (1986) describes a survey that was carried out by the Department of Education and Science in 1973 in which girls showed a very marked preference for Art, Music and Modern Languages while boys tended to opt for Science and technical subjects. Logan's (1988) results also represent the percentage

using computers in Art, Music and Modern Foreign Languages as higher in girls than in boys. This coincides with the results of the above survey done by the DES in 1973.

Subjects	Overall (%)	Boys (%)	Girls (%)
Art & Music	27.1	25	33
Foreign languages	46.3	37	63

In this research as shown in table 17 only 50 (16.1%) and 57 (18.4%) of the pupils' replied to Art and Music respectively with a very small negligible gender difference as presented in the table 17.

Table 17

Do you use computers in Art, Music, Spanish, French and German in school?

Categories	Gender				Total of the sample	
	Boys		Girls		Frequency Of the (310)	Percentage (%)
	Frequency Of the (153)	Percentage (%)	Frequency Of the (157)	Percentage (%)		
Art	27	17.6%	23	14.6%	50	16.1%
Music	29	19.0%	28	17.8%	57	18.4%
French	67	43.8%	68	43.3%	135	43.5%
German	29	19.0%	33	21.0%	62	20.0%
Spanish	18	11.8%	10	6.4%	28	9.0%

In total 43.5% pupils' (with no gender gap) responded positively to French. During the completion of the questionnaire the researcher asked pupils (and also the teachers). "Why are they so interested in French?" Pupils replied that they get the chance to go to France for exchange visits. 20% of the pupils responded positively to German, with slightly more girls (21%) than boys (19%).

The results of the Logan (1988) research show a greater percentage of girls than boys. The present research shows a greater percentage of boys in Art, Music and Modern

Languages. If we look at the results individual languages slightly more girls (21.0%) responded to German than boys (19.0%).

8.13. Qualitative analysis of the use Computers as a separate subject and within Cross-Curriculum subjects in school

Pupils are confronted with that the computer both as a useful tool for learning on its own as a subject and also as an aide in learning other subjects. Are they taught computing as a separate subject in school or as an aid for learning other subjects?

“Sometimes if we are doing something that we really can't get in books then you can go into the IT room but most of the time we use books and look in the library for stuff like that”.

(Boy year 9)

From this above statement it would seem that the computer should be accessed only when all other resources (i.e. library) have failed. It is difficult to be sure whether or not this is a natural reluctance on the part of the pupils or whether pupils as a whole feel discouraged from using this particular resource or pupils have no interest at all in using computers in school. Many schools have limited equipment, and physical access may pose a real problem if the numbers of pupils wishing to avail themselves of this particular facility are too great.

“Oh...we just use it in one lesson every week. You just use it in IT. You don't get it in other lessons, which could help you. Because you should go on the Internet and find out other things like equipment, you could order stuff on it but you can't. You have to learn what the ICT teacher says and you have to do it. That's it really”.

(Boy year 9)

From this there is a very real sense that what the IT teacher says “is the law”, i.e. ‘you should’ and ‘you can’t’. The choice of language by this particular pupil demonstrates a

very real frustration with the process of learning. He knows the potential of computers in theory but feels actively discouraged in employing them to their full potential.

“You just do it like once a week, which is not very good. You should learn more, not just once a week. You could forget what you have learnt. But if its every day or every couple of days you could have learnt more about IT”.
(Boy year 9)

Pupils are aware that the times allocated to this subject are not optimal. They are aware of their own difficulties in learning a new and complex subject and can identify more useful methods of teaching it.

“I don't know. Yeah! But sometimes we use the Internet em...like once at the end of the term in school”.
(Boy year 9)

“No we don't, but we always have it in another subject every week...But it's not compulsory to study it as a separate subject...Sometimes we use it in other subjects. That's if the teachers' booked us into the computer room”.
(Boy year 9)

There appears to be some confusion here. The access is limited and the onus is on the teacher to book the IT room. The pupil has little say in the learning process and is bewildered by the rules which can change from week to week that they play no obvious part in.

“Yeah! We do IT as a separate subject but it's really boring. Like we use the Internet and it's really slow. And you are not allowed to go on to the game websites. They are blocked and stuff like that”.
(Boy year 9)

“No, we don't have it as a separate subject. But if you want to pick it up as separate a subject then you can pick it this year (in year 9) and you study it next year (year 10 and 11). That's all but I don't think it is very important to pick it as a separate subject”.
(Girl year 9)

“Yeah! But we don't use them in other subjects as much.
Sometimes we use them in Maths”. *(Girl year 9)*

There is a very real frustration concerning the access and the implied need to achieve results. In some pupils the only way they can express this is to withdraw interest altogether. If there is not enough time or resources available to achieve set goals, why bother? The option to commence ICT studies at an earlier stage, (year 9), is available and some pupils do indeed take up this option. Pupils can see the potential but do not feel encouraged to experiment and learn in a way that interests them. They do not perceive a continuity in the learning process. ICT alternates with Drama and sometimes does not feature at all if there is confusion in the timetabling. The message given is that ICT is important. However, the message delivered (i.e. the one the pupil receives) is that ICT is of a lesser value and must take a back seat to other priorities when the occasion demands. Although ICT is seen to feature as a part of other lessons (i.e. Maths) it is not represented as having value in itself. It is unsurprising therefore that pupils begin to behave ...they perceive in a

When a question about the use of computers in other subjects is asked it is revealed that computers are not felt to be used to enhance the other subjects' studies. The confusion between what is useful, what is desirable and what is compulsory is demonstrated.

“Oh...we just use it in one lesson every week. You just use it in IT. You don't get it in other lessons, which could help you”.
(Boy year 9)

“Um...it depends which lesson I have um...because I could do the homework at school. But I won't if it's too long”. *(Girl year 9)*

“Yeah! But we don't use them in other subjects as much.
Sometimes we use them in Maths”. *(Girl year 9)*

One girl is clearly unsure what the rules governing access to computer equipment entail. Another girl won't do her homework at school "if it's too long". There is a clear desire for knowledge here but one that is not being satisfied on a meaningful level.

8.14. Qualitative Analysis of time Available for the Use computers in school

The researcher was puzzled by the apparent anomalies inherent in pupil responses regarding the amount of time that was designated to IT. It appeared that the most practical and logical approach would be to probe further into pupils' attitudes and perceptions and then compare this with the quantitative evidence gathered earlier.

Time is a major factor affecting both the process of learning and the enjoyment of leaning. Individual pupil's perception of time, especially "quality time" i.e. designated and rewarding time, varies considerably. For this reason the questions concerning this area were asked in different styles and approaches, devised to encourage both accurate and honest answers in as much as the pupil was able to do so.

Most pupils, regardless of personal abilities or interest, perceive the lack of time devoted to IT as a genuine obstacle to learning. One pupil suggests that one hour per day may be a more effective alternative to the present regime of less than two hour per week of dedicated teaching. This is perceived as restrictive to those pupils who are already knowledgeable in IT and frustrating for those pupils who are less confident and already struggling to keep up. One hour a week is just long enough for the less able pupils with no home access to equipment to forget all that they have previously tried so hard to acquire.

"You just do it like once a week, which is not very good. You should learn more, not just once a week. You could forget what

you have learnt. But if its every day or every couple of days you could have learnt more about IT”. *(Boy year 9)*

“Em... I don't think its good enough for me really because I am doing GCSE. I need to know more about it really”. *(Girl year 10)*

8.15. Conclusion

Both the quantitative and qualitative survey results demonstrate that the actual time available to pupils may not be enough for them to produce results equal to that perceived efforts. The pupils found it difficult to overcome the obstacles of time and inappropriate equipment.

CHAPTER 9

MODES OF INSTRUCTION AND TRANSFER OF

KNOWLEDGE IN ICT

Chapter 9

Modes of Instruction/Transfer of knowledge

9.1. Introduction

Karovsky (1989) points out that in 1972 the Definition and Terminology Committee of the Association for Educational Communications and Technology described Educational Technology as ‘using a systemic approach to the development of learning resources’ (p36). ‘Governments, corporation and local communities have responded positively to this concern by providing funds, equipment, and other material resources to educational institutions to encourage the practice’, US Congress (1989). HMI Series (1989) defined ‘information technology’ as “the technology associated with the information: its storage, processing and transmission in a variety of forms by electronic means and its use in controlling the operation of machines and other devices”.

These definitions derive from much longer statements, which include a rationale for the field of engineering. These statements do not include the learning and teaching process, or the applications and implications of technology in the context of education.

For the purposes of this research it is necessary to determine which teaching aids are generally perceived to be the most effective in communicating knowledge and what kind of response these aids generate in their users. Certain delivery tools may be more effective in delivering some subjects but others less so. Does the method employed influence the amount of knowledge received? Are some methods more effective or less effective than others?

We need to know whether or not the teacher gives any instructions before the start of any lesson in which a computer is to be used, either for its own sake or in other subjects in the class. How do pupils rate the instructions they get from their teachers in the class? The results in the following table demonstrate the extent to which ICT has been used in the ways in which it was envisaged, both as a tool and a subject.

The vast majority of respondents, as shown in table 18 (97.1%) said ‘yes’, they do get instruction from their teachers in the class. In this way the relationship between teacher and computer may be seen as one of “equals”. Both engage the student and instruct them but the teacher is the central controller and central to students’ experience.

Table 18

Do your teachers generally give you instructions before you start to work on computers in school?

Categories	Frequency	Percent
Yes	301	97.1
No	9	2.9
Total	310	100.0

This result shows a positive pupil response, concluding that most teachers demonstrate instructions before starting the lesson.

The next question is how do pupils rate the methods of demonstration which are used in class? The result is shown in the following table. In terms of frequencies and percentages table 19 shows that of those respondents who said they get instructions from their teacher in the class 42.6% replied ‘Always’, 37.4% ‘frequently’, 17.1% ‘Sometimes’, 2.3% ‘Hardly ever’, and only 0.6% said that they never get instructions.

Table 19**Do your teachers give you “instructions”?**

Categories	Frequency Of the (310)	Percentage
‘Always’	132	42.6%
‘Frequently’	116	37.4%
‘Sometimes’	53	17.1%
‘Hardly ever’	7	2.3%
‘Never’	2	0.6%

9.2. Possible Modes of Instructions

Morton (1996) observes that although there is a great emphasis on the use of computers to deliver instructions in classrooms, it is not evident how many teachers have adopted microcomputer technology for that purpose. As Butterfield and Nelson (1989) suggest, simply doing a thorough job of teaching the task is usually not sufficient in itself to bring about transfer of knowledge. They also argue that, in addition to directly relevant knowledge successful transfer requires inferential reasoning and the monitoring and regulation of problem solving, as well as metacognitive skills.

In relation to these statements the next question asked was in which way teachers deliver instructions in class. Pupils were given possible choices of different methods which may be used. Choices included both old and new methods of delivering instruction based on those delivery methods present in all schools participating in this research. Table 20 shows the different choices of methods of instruction with the pupils’ preferences rate.

Table 20**Different methods of instructions used by ICT teachers**

Methods of Instructions	Frequency	Percentage
“Writing on boards”	Of the (310) 215	69.4%
“Verbal instructions”	Of the (310) 206	66.5%
“Hand out”	Of the (310) 179	57.7%
“Instruction on screen” (Computer)	Of the (310) 109	35.2%
“Overhead projector”	Of the (310) 18	5.8%

Table 20 shows that the majority of respondents (69.4%) said that their teacher delivers instructions by "Writing on boards", 66.5% said "Verbal instructions", 57.7% responded to "Hand outs", about 35.2% replied "Instruction on screen" (Computer), 5.8% said the "Overhead projector".

This is an indicator of teaching preference. "Writing on boards", and "verbal instructions" require less time to prepare the lesson. It may be also observed that most of the information delivered is received in a written format – one that the student may take away and refer to later.

Although the new technologies are becoming more and more popular and fast to use in schools, teachers still use traditional styles of instructions. It is obvious from the results that the teachers' preferred methods of demonstration in the classroom are still "Writing on boards", and also delivering "Verbal instructions". There is no discernible change to be found in the classroom from the traditional and well-established. Different researchers show different points of view towards the use of new instructional methods in the classrooms.

Gbomita (1997) writes that:

"In effect, the adoption of the microcomputers for delivering instruction lagged behind its increasing availability in schools".
(p.88)

This was partly due to the costs involved and also to the perceptions of teachers. Sulley (1987) lamented that only 10% of teachers had incorporated the microcomputer into their curriculum at that time. Butzin (1992) observed that the effective use of educational technology remained an elusive goal for most teachers. The reasons for this remain

unclear although it was noted that older teachers showed a significantly higher level of reluctance to use ICT in the classroom.

Morton (1996) says that:

“While the real world uses computers to move forward, educators too often look studiously backward”. (p.417)

The human condition is such that we are able to make sense of and analyse the past. This is considerably easier than accurately forecasting an uncertain future (Hubbard 1981; Hawkrige 1983; Greg Kearsley et al 1998).

9.3. Interaction and Interactivity

In terms of interaction and interactivity the most commonly used term is ‘delivering instructions’ either in the classroom or in distance learning. In the classroom environment interaction could be teacher to student to teacher, student to teacher to student, peer group interaction, peer group computer based instruction, and individual computer based instruction. Many other researchers (Rogoff and Gardner 1984; Berliner 1985; Collins 1990; Burns, Goin, and Donlon 1990; Bergs 1999; Michael Yacci 2000) have observed that interactivity is central to the expectations of teachers and learners.

Different types of possible interaction, which can occur between the teacher-student-teachers during the demonstration of instructions in the classroom learning, are shown in the following table (21).

Table 21

Do your teachers give you instructions in the class: -

Categories	Frequency	Percentage
Individually	Of the (310) 88	28.4%
In small groups	Of the (310) 34	11.0%
In large groups	Of the (310) 27	8.7%
Whole class	Of the (310) 287	92.6%
As you need help	Of the (310) 158	51.0%

As presented in the above table (21) 92.6% of pupils responded 'whole class', 51.0% 'as you need help', 28.4% 'individually' then 'small group' and 'large group' 11.0% and 8.7% respectively. This indicated that teachers' favourite and preferred style of delivering instructions is 'to the whole class'. This is the continuation of the tried and tested standard model (i.e. instruction and support as needed), traditional but still popular. This type of instruction does not in itself establish a close interaction between teachers and pupils. Although the teacher gives instructions to the pupils when they need help and establish one-to-one collaboration this is not always the most effective style to develop interaction. This is a pupil-oriented style. They ask the teacher for help as and when they need it. In the classroom teachers are more dominant. Observations showed that some times teachers told pupils 'do whatever you are told to do and follow the instructions on the instructions sheet'.

9.4. Interaction between Computers and Learners/Interactivity with computers in the class

Hartley (1996) explains that as computers become more prominent in classroom instruction their modes of use are extending, (for example as a surrogate teacher in tutoring or as curriculum enrichment in simulation applications) where pupils are more investigative in their learning methods. However, within the classroom such programmes often have effects and are used in ways that were not always anticipated by their designers. This argues for Computer Assisted Learning (CAL) environments in which the software is interactive but is able to adapt to different styles of learning and teaching. They also argue that Computer Assisted Learning (CAL) should be designed to take greater account of their possible and differing modes of use, and the varying requirements of directions, support and exploratory/investigatory methods that might be employed in

the classroom. Carnery (1986) Hawkins et al, (1982) observed that limited resources in the classroom encourage teachers to have pairs of pupils working together with the advantage of increasing peer interaction (Podmore, 1991) and this can be an important influence on learning,(Akpinar and Hartley; 1996). In the classroom, programmes are often used by small groups of pupils and there is evidence (Van Lehn, 1988) that these pupils' interactions and explanations result in clear learning benefits (In Akpinar and Hartley 1996).

It is evident from much other research (Gordon et al 1989; Savlin 1991; Chacon 1992; Squires et al 2000) that group communication serves to further collaborative learning. This in turn, helps individuals to make progress i.e. a "hidden" facet to individual learning but a powerful one nevertheless. It would seem then that the general consensus of opinion favours small group work as the most effective learning approach.

Wellington (1988) found that the average number of computers were 13.4 in English schools. In the present research it is found that the number of computers ranges from 90-278. Those are situated not only in the computer rooms but also in different classrooms, computer rooms, library, computer clubs etc.

A question was asked of the pupils as to which classroom setting they use computers in. The results in the following table (22) show the different results. Overall 87.1% of the pupils' said that they use computers "individually" in the class. There is a very small gender difference in using computers "individually" in the class as more girls (87.3%) claimed than boys (86.9%).

Table 22**In school do you use computers: -**

Categories	Gender				Total of the sample	
	Boys		Girls			
	Frequency Of the (153)	Percentage (%)	Frequency Of the (157)	Percentage (%)	Frequency Of the (310)	Percentage (%)
Individually	133	86.9%	137	87.3%	270	87.1%
In small groups	36	23.5%	42	26.8%	78	25.2%
In large groups	13	8.5%	9	5.7%	22	7.1%
Whole class	19	12.4%	15	9.6%	34	11.0%
As you need help	9	5.95	17	10.8%	26	8.4%

Only 25.2% pupils said that they use computers “in pairs”. Additionally, with regards to using the computers “individually” in the school, just 7.1% said that they use computers “in small groups”, and 11% and 8.4% also use “large group” and “whole class” activities respectively. The results show that there is more collaboration between the computers and the pupils and less so between peer groups and between the teacher and student. The majority of the pupils work on their own. They get instructions from their teachers who use traditional methods of delivering instructions (i.e. board and handouts with instructions). Although the pupils get the chance to use computers in class it does not mean that schools have the computers available individually or to the whole school. It is the year 9 & 10 pupils who get the most chance to use computers individually. They use them in turn just once a week for ICT as a separate subject and sometimes in other subjects in pairs, small groups, large groups and the whole class. This all depends on the availability of computers in the classrooms or in the computer room.

Group learning can present its own disadvantages. Running such exercises can pose a number of organisational problems, not the least of which is the fact that it may be difficult to fit them into the normal learning curriculum especially if the exercise is a long

one. It can also be difficult to assess individual student performance fairly or to evaluate the exercise other than as a subjective basis.

9.5. Pupils' Preferences

Much research has been carried out on the different types of interactivity and the learning environment of the classroom. These include interpersonal relationships amongst pupils, pupil-teacher relationships, the material provisions of the classroom and pupils' liking for different subjects and methods of teaching. There is a lack of research on pupil preferences, i.e. in which classroom setting they want to learn how to use the computers. The following table (23) show that pupils like to learn using computers individually and enjoy individual interaction with computers as well as working pairs.

Table 23

Would you prefer to use computers in school: -

Categories	Gender				Average	
	Boys		Girls			
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Individually	114	74.5%	116	73.9%	230	74.2%
In two's	22	14.4%	26	16.6%	48	15.5%
In small groups	5	3.3%	6	3.8%	11	3.5%
In large groups	2	1.3%	1	.6%	3	1.0%
Whole class	10	6.5%	8	5.1%	18	5.8%
Total	153	100.0%	157	100.0	310	100.0

A majority of pupils said that they prefer to use computers "individually". There is a very negligible gender difference. (74.5% of boys and 73.9% of girls expressed a preference for using computers individually). Only 14.4% and 16.6% preferred to work in groups. This has implications for the whole premise of using group work in ICT related subjects. Weller (1988) observed a common type of interactivity is computer-

mediated learning in which the learner actively adapts to the information presented by the technology, which in turn adapts to the learner, a process more commonly referred to as feedback.

Another question asked the pupils about the best way of learning to use computers in school. Results in the following table (24) show that 73.5% said they learn best using computers in school “individually”. Only 15.7% boys and 17.8% girls said in “pairs”.

Table 24

Do you learn best on computers in school when using them: -

Categories	Gender				Total of the sample	
	Male		Female			
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Individually	113	73.9%	115	73.2%	228	73.5%
In two's	24	15.7%	28	17.8%	52	16.8%
In small groups	6	3.9%	5	3.2%	11	3.5%
In large groups	0.0	0.0%	1	0.6%	1	.3%
Whole class	10	6.5%	8	5.1%	18	5.8%
Total	153	100%	157	100%	310	100%

Sutherland and Hoyles (in Beynon and Mackay; 1993) found that girls emphasized the importance of receiving help from their peers, whereas boys saw group work as distracting from their work (p168). The study results show that both boys and girls have approximately the same preference when it comes to using computers in class. This implies that girls get the equal chance to use the computers as do the boys.

As Hall & Rhodes (1988) observed, there is a need to monitor whether girls are receiving the same access of opportunities to micros as boys. Beynon & Mackay (1993) found that there is a real difference in the way that boys and girls use computers.

Murray (1994) describes that at the level of individual learners there are probably three distinctive influences at play that impact on cognitive change:

- The learner's existing knowledge and experience;
- The learner's 'style' or predisposition to learning;
- The learner's acquired and individual approach to learning.

(In Martyn Wild & Clark Quinn, 1998, Vol. 29 (1), 73-82).

From this it is concluded that:

- Those individuals who have prior knowledge and experience of using computers anywhere, at home or school, prefer to work 'individually';
- Girls do at least as well as boys in computer problem solving;

The very small gender gap in the responses of this item can be put down to difference in socialization, including:

- Gender role identity;
- And gender stereotypes in media portrayals.

Boys, due to their dominant behaviour, might tend to use computers more in school and are more likely to own one as well, but girls are equally enthusiastic to get the computer in the class as boys, although more amenable to working in pairs.

Individual learning depends on software. Powerful features of software do difficult thinking for us, but the empowerment of being able to use this software can help us think and devise our own solutions.

Cousins et al (1993) mention that computer literacy often refers to knowledge of content-free applications such as word-processing, databases, spreadsheets, drawing applications, and so forth, and that these courses can be used in different subject areas. The most obvious use of computers in English, for example, centres around word processing and desktop publishing.

Hawkrige (1990) mentions the “Computer Application Courses” for the first and secondary classes, aimed at deepening and enriching the concepts and skills which pupils achieve in 10th grade. He divides this course into two levels including the following subjects: BASIC or PASCAL programming, computer applications in commerce, tourism, and collaborative writing. This could be called a course in computer literacy and awareness, an acquired ability that could be applied to other subjects.

Wellington (1988) observes that many schools have achieved introducing computer education solely in the option choices for their fourth and fifth years (year 10 and year 11). A typical computer awareness course has modules in information handling, keyboard, stock control, word processing and telecommunication. Robinson et al. (1996) use the quantitative approach to check how quickly pupils became familiar with these applications. Instead of collecting data while pupils were using PC's in the classroom they provided ‘Pocket Books’ (Palmtop Computers). They found that 86% of pupils claimed to be familiar with the use of word processing, 43% with spreadsheet and 83% with databases. Pupils were using them in schools either ‘very frequently’ (86%) or ‘frequently’ (10%).

Mumtaz (2000) found that the most frequent activity on the school computer was word processing with 64% of children using their school computers to word process every day. In the present research the researcher used the quantitative approach to collect data from pupils who are using computers in schools for different computer awareness courses. This study is not a comparison between the teachers and pupils' knowledge to use these applications. This study is only concerned with the pupils' method of using computers, their attitudes, behaviour, thinking, and feelings towards computers in schools and at home. The next question was asked in order to determine which aspect of ICT was the more attractive to pupils as a learning tool. The replies support the findings of earlier research.

The results in the following table (25) show that 272 of the 310 (87.7%) responded to "Word processing", 72.9% to "Spread Sheets", 45.2% to "Databases". The response of pupils to the first two categories is higher than previous research indicates but is less concerning the use of databases. This does not mean that they use databases less frequently in schools but that they also use spreadsheets to keep the different types of data and to represent that data graphically.

Table 25

Do you use computers in school for: -

Categories	Frequency of the (310)	Percentage
"Word processing"	(of the 310) 272	87.7%
"Spread Sheets"	(of the 310) 226	72.9%
"Internet"	(of the 310) 219	70.6%
"Drawing Pictures"	(of the 310) 114	36.8%
"PowerPoint"	(of the 310) 142	45.8%
"E-mail"	(of the 310) 109	35.2%
"Databases"	(of the 310) 140	45.2%

In 1985 Stonier and Conlin emphasised that the computer is not merely another piece of educational technology the same as any other tool (Beynon 1993).

This study shows that schools are not only sticking to these applications. They are using computers for other courses. Results show that the majority of pupils (70.6%) use computers in schools for “Internet” applications; “Drawing Pictures”, “PowerPoint” and “E-mail”. It demonstrates that schools are progressing to train the pupils in these courses.

The Internet offers many opportunities for accessing and understanding information and can present this information in a variety of “user friendly” formats which can engage the student on many different levels (i.e. visual representation through diagrams, graphs, photographs and maps, audio representations of animal cries and spoken languages etc). How and when tutors choose to apply these possibilities to the subject matter in hand will vary from individual to individual. In some subjects, it can be demonstrated they will hardly be used at all.

The development of interactive Web-based instruction suggests that pupils can get more information and knowledge from computer-based instruction rather than from teachers in the classroom. Pupils frequently use CD-ROM, or Internet and e-mail applications. In addition they can use different web sites and encyclopaedia and can also pick facts and pictures from reference sources. Teachers cannot provide all these things in the same way (Sherry and Wilson 1997; Daugherty and Funke 1998; Liaw 1999).

Results in the following table (26) show that the pupils’ views are consistent with this type of interaction. Only 44.2% said that they get the ‘Same Information’, 30.6% said

'more Information' and 23.5 % 'much more Information' from computers than they get from the teachers and books.

Table 26

Do you think that by using computers compared to other means (e.g. books and teachers), you can get: -

Categories	Gender				Total of the sample	
	Boys		Girls		f	%
	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)		
"Much More Information"	39	25.5%	34	21.7%	73	23.5
"More Information"	47	30.7%	48	30.6%	95	30.6
"The Same Information"	64	41.8%	73	46.5%	137	44.2
"Less Information"	2	1.3%	1	0.6%	3	1.0
"Not much information"	1	0.7%	1	0.6%	2	0.6

Results established that the teacher and their method of teaching is still as pervasive as it was (see interview analysis) and teachers are still the main source of information. Girls do as well as boys and in some cases girls are found to be more confident in using computers. Reduction in a teacher's authority may result in a lack of confidence in their pupils.

There is a small gender difference in response to two of the categories as more girls responded 'the same information'. 25.5% boys and 21.7% girls stated 'much more information' was the next preferred response and approximately the same percentage of both genders said they get 'more information' by using computers compared to other means e.g. books and teachers.

Yet for many teachers, the relative lack of control over the teaching is a problem which is more apparent than with a traditional system. Poorly supervised pupils may run the activities themselves, resulting in a subtle alteration to what was intended. Liaw et al.

(2000) from their study, on Enhancing Interactivity in Web-Based Instruction, concluded that each medium has its own particular purposes (p44). Bergs (1999) explains that the misuse of interactivity, synchronicity, and technology can lead to loss of the learner's attention, boredom, information overload and frustration. A student whose attention is not fully engaged is a "loose cannon" in the classroom. Boredom can very swiftly escalate into non-compliance and aggression if not immediately identified and addressed.

Chandler (1992) says that:

"It is important to insist that there is no more information in computers than there is in books. Computers, even more than books, masquerade as 'containers' of information" (1992; pp.172-173).

This may be so, but computers can also store opinions (i.e. websites) and these can inspire creative thought and increase the desire for further learning. Stonier, & Conlin (1985) expressed the view that the new computer based literacy programmes, properly used, will generate an interest in reading which at present is lacking. Computers, unlike books, are interactive.

Early findings from the National Reading Panel research (2000) indicate that computer technology can contribute to the improvement of reading instructions. In any field of life, especially in education, if we are a student or a teacher the use of paper. The traditional style of writing using worksheets, notebooks and pen is still very popular. There is a great emphasis on the use of the worksheets or notebooks and pen. As Chandler (1984) remarks, if we expect learning to be imparted by a teacher, the phenomenon of a child using a computer for her own purposes will not seem like learning. He explains the priorities for children to learn are as follows:

“That there should be a supportive environment; that suitable tools (such as pen and books) should be available; that there should be access to competent practitioners of the craft that the children want to acquire (not necessarily adults); that there should be opportunities to learn together with others (not necessarily children)”. (p.85)

Beynon (1992) explains that drafting on screen is very different from writing by hand.

With pen and paper, one can cross things out without losing them forever.

“Word-processing involves the suppression of the unconscious and our sense of self”. (pp.180-181)

Research has been done on the importance of many tools which are associated with writing, but they could not find anything regarding pupils’ feelings about what they want. They may want to use notebooks or the word processor for handwriting

Results of the study show the different attitudes of pupils regarding the use of notebooks, workbooks and computer software packages. It found that there is a greater inclination/interest towards the use of computers for writing purposes, for using new technology in the familiar way.

Results presented in table 27 shows that on the whole 40.6% pupils responded to ‘Very easy’, approximately the same percentage (41.9%) of pupils to ‘Easy’, and 15.2% to ‘Neither easy nor difficult’. A very small percentage (1.3%) and (1.0%) responded ‘Difficult’ and ‘Very difficult’ respectively.

Table 27

**Do you think that using a computer rather than worksheets or books to
perform a task is: -**

Categories	Gender				Total of the sample	
	Male		Female			
	Frequency Of the (310)	Percentage (%)	Frequency Of the (310)	Percentage (%)	Frequency Of the (310)	Percentage (%)
“Very easy”	78	51.0%	48	30.6%	126	40.6%
“Easy”	55	35.9%	75	47.8%	130	41.9%
“Neither easy nor difficult”	15	9.8%	32	20.4%	47	15.2%
“Difficult”	3	2.0%	1	.6%	4	1.3%
“Very difficult”	2	1.3%	1	.6%	3	1.0%
Total	153	100.0%	157	100.0%	310	100.0%

Scrimshaw (1997) observes that software is used in ways that match traditional classrooms and that software packages can be grouped in the same way as conventional materials for their potential roles in teaching and learning. Healey, & Sutherland, (1991) argue that spreadsheets allow pupils to express general mathematical relationships which are far more sophisticated than those which they normally express in paper and pencil work.

The researcher concluded that text handling of computer packages gives pupils the confidence to present their work ‘easily’. Pupils increasingly appreciate the advantages of the use of word-processors and other text manipulating utilities such as planners, dictionaries and spell checkers where appropriate. Also, in being able to enter text in different sizes, add paragraphs, cut and paste, and organise layout to accommodate illustrations, pupils can explore the possibilities of transmitting data via systems such as electronic mail and videotext.

Games and simulations have a significant role to play in imparting transferable skills to the user in such a way that the user her/himself may be unaware on a conscious level that they are acquiring any new skills at all! For example a student who is enjoying “the thrill of the chase” in a fast moving “shoot ‘em up” computer game is also acquiring valuable skills such as problem solving and logical thinking patterns as well as exploring the pros and cons of calculated risk ventures in the safe and secure environment of home or classroom. The consequences for the simulated hero of these games may be death if a wrong decision is made but the user will certainly survive to fight another day and will remember the lessons she/he has learned from previous experience.

9.6. Games and Simulation

There is an understanding amongst educational psychologists that simulation and adventure games, by their very nature, put children in situations which require them to use many skills to complete a task successfully.

Microcomputers would seem to have a role to play in this area, with the emphasis on simulation programmes and adventure games. The importance of simulation and games is presented in different cognitive theories and in other research as well (Vygotsky 1962; Piaget 1969; Tough 1979; Heinich 1989) say that playing is a vital part in concept development.

Pupils play different types of games in school, home or elsewhere. They face challenges and thereby increase their thinking and cognitive skills. They feel enjoyment, pleasure and respite from work when they play games on a computer. In some instances ICT can operate as an escape or release from the outside world. By playing educational games

they can improve their knowledge learn about their subjects and get information in ways other than books and teachers (e.g. in science they can get knowledge about animals and their environments, using encyclopaedia or CD-ROM).

Educational games provide practice of skills in a form that motivates pupils to practice and enjoy exploration leading to the discovery of principles. Role play games, action games like shooting games (e.g. Indiana Jones, Doom etc) increase, grow and expand the imaginative skills. These games are very fast, making the pupils use their brain and fingers quickly and keeping them busy both mentally and physically. Strategy games like 'Army Action' and puzzles games, improve tactics and make the pupils think in a lucid manner. Sports based games are also like role play games as they (e.g. football games) give pupils more enjoyment, and especial pleasure when they win.

Most of the pupils enjoy role-play, action or sports games. These provide them with enjoyment and pleasure. They use computers for educational games because these games are associated with the gain of greater knowledge about their subjects. Pupils also use these games outside of lessons. During lessons they use CD-ROM and Encyclopaedia.

It is argued that Information Technology can enhance and extend not only children's ability to carry out physical activities, but also children's cognitive skills (Papert 1980; Underwood and Underwood 1990; Scaife and Wellington 1993; Cox 1994; Loveless 1995).

Skilled use of IT can lead to the cultivation of higher level cognitive skills, for example "actively finding knowledge, interpreting results and testing hypotheses" (Laurillard,

2002, p.81) and such high levels of cognitive processing are synonymous with deep approaches to learning.

Due to the importance of the use of Information Technology for simulation and gaming research has been conducted on theories concerning the relationships between thought and language and also on the pupil's enjoyment and pleasure derived from playing games in school and at home. Results showed the response from pupils to all these questions in the following table (28).

Table 28

Do you use computers in school for "playing games"?

Categories	Gender				Average	
	Boys		Girls			
	Frequency (<i>f</i>)	Percentage (%)	Frequency (<i>f</i>)	Percentage (%)	Frequency (<i>f</i>)	Percentage (%)
Yes	41	26.8%	36	22.9%	77	24.8%
No	112	73.2%	121	77.1%	233	75.2%
Total	153	100%	157	100%	310	100%

Overall only 77 pupils (24.8%) pupils responded to 'playing games' in school, with a small gender difference (more boys (26.8%) and less girls (22.9%)). The overall percentage of playing games in school is higher in the present study than that conducted by Culley (1986). In her study from the sample of 394 only 5% girls and 10% boys reported that they play games on computers. The gender gap is also high, with only half of the girls than boys expressing an interest in games. However the opportunities for games playing are greater now due to advances in technology and access to equipment.

Although only a small percentage of pupils reported that they play games in school the researcher wanted to know which types of games they play and which are their preferred games. The object was to discover if these pupils also played games at home and, if so, to what extent?

However, such environments can exhibit both social and cognitive drawbacks. Socially, the environments are meagre. They do not provide the necessary opportunities for social interaction. That environments exhibit low sociability, minimal social presence and weak social presence.

Educational games are more grounded in reality, less imaginary and less imaginative than their commercial rivals. They are carefully set within the bounds of what is likely to be possible today or in the near future. One of the main disadvantages therefore can be that the player can limit their view of the world instead of letting a natural sense of adventure go freely. Such games are not necessarily that good for the individual but may have benefit if used within small groups.

Table 29

Which games do you play in school: -

Categories	Gender				Total of the sample	
	Boys		Girls		Frequency Of the (310)	Percentage (%)
	Frequency Of the (153)	Percentage (%)	Frequency Of the (157)	Percentage (%)		
'Educational Games'	30	19.6%	36	22.9%	66	21.3%
'Strategy games'	32	20.9%	19	12.1%	51	16.5%
'Action Games'	33	21.6%	13	8.3%	46	14.8%
Sports based games'	23	15.0%	11	7.0%	34	11.0%
'Role play'	9	5.9%	8	5.1%	17	5.5%

The results in the above table (29) show that (21.3%) pupils responded to the 'Educational Games' with a small gender difference. More girls (22.9%) and fewer boys (19.6%) showed an interest in Educational games.

Hawkrige (1983) describes the importance of 'Educational Games' thus:

"... Programmed learning does not put pupils in charge of their learning as much as educational games do. These educational games are based on two aims: to provide practice of skills, in a form that motivates pupils to practice, and to motivate exploration leading to discovery of principles". (p.176)

Results as in the above table (29) show that the next preferred games of the pupils are 'strategy games'. Strategy games test the players' decision-making skills which have a high significance in determining the final outcome of the game. Only 16.5% of pupils showed their interest in 'strategy games' with a large gender difference (20.9% of boys and (12.1%) of girls. 14.8% pupils responded to 'Action Games', again demonstrating a large gender difference (21.6% of boys and (8.3%) of girls. Action games move tiny amounts of information through the interaction circuit at high speeds, relying on sub-cerebellar function rather than considered response. To 'Sports based games', more than twice the percentage of boys (15.0%) than girls (7.0%)] responded. For the 'Role play', overall 5.5% of pupils responded, with a negligible gender gap.

The above results indicate that pupils are not allowed to play games in schools, despite their great interest in them. If pupils are interested in playing games in schools and schools offer an environment in which pupils can engage themselves in different creative activities, (as from many different studies as mentioned above), why are they not allowed to play games in schools? Perhaps there are limited facilities in the classroom, (i.e. limited number of machines in the classroom and limited time periods in which teachers

are available). Teachers also think that if pupils play games in the classroom they will not concentrate on their curriculum subjects and they may also waste time in other activities (Everest, Pioneer, Westward (1847); and archaeologist (Expedition to Saggara) Reid 1985; Loveless 1995).

During observation and also during the time when pupils were completing the questionnaires in class and outside school hours, the researcher asked the teachers if pupils are allowed to play games in the school. The same question was asked of the pupils. Both teachers and the pupils answered the same. If they finish their class work or their ICT or other lesson quickly the teacher allows them to play games in class, but only for a few minutes. This is because most of their time they use computers for their lessons. They can also play games in the computer clubs, during other lessons, library periods etc. However, on the whole, they do not get a great deal of time to play. Only a few pupils reported that they play games in ICT lessons, in other subject lesson time and in the library. Pupils are also provided with computers outside school hours, for different activities like using CD ROM, Encarta but most of them play games when they get a chance, which is rarely.

The results in the following table (30) shows that only 5.2 % pupils said that they play games 'During ICT lessons' with a small gender difference i.e. 5.9% of boys and 4.5% of girls. Only 9.0% pupils responded for 'other lessons' with more girls (10.2%) and (7.8%) boys.

Table 30**When do you play games in school: -**

Categories	Gender				Total of the sample	
	Boys		Girls			
	Frequency Of the (153)	Percentage (%)	Frequency Of the (157)	Percentage (%)	Frequency Of the (310)	Percentage (%)
'During ICT lesson'	9	5.9%	7	4.5%	16	5.2%
'During other lessons'	12	7.8%	16	10.2%	28	9.0%
'Outside lessons'	38	24.8%	33	21.0%	71	22.9%
'In the library'	12	7.8%	10	6.4%	22	7.1%
'In computer clubs'	41	26.8%	33	21.0%	74	23.9%

Beynon (1993) observes that computer games provided an impetus for many boys to become more acquainted with computers and with programming in particular. He also says that 'games form a key part of an important social network outside schools from which girls are excluded' (p151).

In his study he also found that computers were made available to pupils at lunchtime and out of schools hours, but few girls took this opportunity to use the computers and comprised only 10 % of total pupils who used computers outside lesson time. However the results of the present study in the above table (30) show that on the whole 22.9% pupils used computers 'outside lessons' with a small gender difference (24.8% boys and 21% girls). It shows that an increasing number of girls are using computers outside lesson hours. When we look at the response to the use of the computers in the 'Computer clubs', on the whole 23.9% pupils responded to this choice with approximately the same gender difference as for 'Outside the lesson' (26.8% boys and 21.0% girls). However the number of pupils who use computers 'outside lessons' or outside school hours on different locations is very small mainly because they are not allowed to use computers without supervision, especially for playing games.

In one school a teacher reports that she brought computer games for pupils to use in the 'Computer club'. She found that pupils representing a range of abilities were interested in attending the 'Club' but when the advisor found about it he asked the teacher not to bring in any more games. This was to ensure that pupils would not think that computers were only for playing games and to allow more time for practice. After this the teacher told me that she noticed not as many pupils came to the club as before, with the exception of those of above average ability. It was observed that pupils of one school used the Computer Club computers for their subject lessons. One of the pupils started playing games when the teacher had moved away. When the teacher noticed this he demanded, "what are you doing? You only do what you are told to do".

Only 7.1% girls responded to the use of computers in the 'library'. This confirms that some pupils do indeed use computers after school hours. While pupils were completing the questionnaire the researcher asked them how they found time to play games in school when games are not part of their curriculum. Some of them reported that they do play games, but they do not let the teacher know. If the teacher notices they just minimise the window.

There are distinct barriers between pupils and the computers which restrict access to games:

- Limited number of machines in the schools;
- Limited amount of time;
- Lack of knowledge and interest on the part of the teacher;
- Restricted access in lesson times;
- A conception by the teachers that using the computers to play games is an abuse of resources.

Pupils and teachers have access to rich resources. Classrooms are filled with books, audiotapes, and videos. Nearby libraries and computer labs offer more opportunities for learning. Children learn more effectively when they are at our most playful and pleasurable, when they engage with ideas in a way which involves the exercise of our own creativity. Hackbarth (1997) noted that Web Based Learning activities can be successfully integrated into the school curriculum. Polling (1994) states that: -

“ For those professional educators who wish to get closer to their pupils and are willing to spend a few more minutes each day on their computers, using electronic mail (e-mail) facilities can become an extremely effective supplement to your teaching efforts”. (p.53)

E-mail can also access experienced mentors (or telementors) to provide support, conduct cultural exchanges with other schools and consult experts with regard to topics that cannot be answered by the school library. However many teachers have a reluctance to introduce e-mail into the classroom as it can be difficult to monitor in a group setting.

9.7. The use of the Internet

When we combine the quantitative and qualitative data, many pupils stated that they enjoy using the Internet facilities in school (where these are available) to explore subjects in more depth and perhaps address ideas and concepts that are not always presented in the classroom.

Pupils were then interviewed about their views regarding the Internet. The researcher was interested in discovering how the pupils perceived the Internet as a learning tool and to what extent they incorporated its use into their school studies and assignments. The

resulting interviews revealed a strong awareness of its potential but, again, some very real frustrations associated with the potential applications regarding access and autonomy.

"I don't think so because we can't go onto all the websites. We are not allowed to go on all the websites like games, music and things like that because they are blocked off which is something to do with law..." *(Girl year 9)*

Pupils are aware that Internet access is for work purposes only and here is a grudging acceptance that this is the way of the world. They perceive the reasons why some sites are denied access (i.e. "dirty websites", "something to do with law") but at the same time they are aware of the existence of such sites and this knowledge cannot be made to vanish conveniently from their consciousness. They enjoy "putting one over" on the teacher, (i.e. the boy who hides his games when the teacher approaches and returns to them once the danger of discovery has passed).

Sometimes they are allowed to use the Internet but not all the time. It is up to the teacher who may or may not let them. They are hardly ever allowed to go on certain websites because many of the sites are blocked off. If they try to go on it then they get into trouble.

"Yeah! I go to 'Googles' and I just type it and click on search. But some websites like the 'Ring Tone' one, games, music and sports we cannot go into. In school they don't like it. They are all blocked off but at home you can do whatever you want to do. In school if you go on those websites you get warnings. And if you do it 3 or 4 times you get caught and your teacher does not put you back on. But at home I can talk to my friends. I can download to music, save it on my own PC. And I do what I want to do because its my own computer" *(Girl year 10)*

However this doesn't prevent pupils from trying to access these sites if an opportunity presents itself. Like the fruit of the knowledge of good and evil, its very presence makes it all the more desirable to us, even when we have our choice of everything within the garden.

Despite the warnings given, some pupils attempt to access blocked sites repeatedly until the teacher removes them from the computer. Even pupils who have access to these sites at home will still try to "challenge the system" although there is no obvious immediate benefit to them in doing this.

"No, I used it when we had the old IT teachers. If we did like half an hour work he let us go on to the Internet. But this teacher doesn't let us go on the Internet". *(Girl year 10)*

"Yeah! You need permission though to go on the Internet. Otherwise you are not allowed to do that without a permission slip. Teachers can see what we are doing, if we are we doing any work or not and if we are not doing our work they don't let us use the Internet. We can just use the www.Google.com. I just type it then press enter and get all the information".
(Girl year 9)

Pupils feel a very real resentment at not being able to access the Internet as and when they choose. One girl reports that her new IT teacher has forbidden the use of the Internet completely. She does not elaborate on this statement. It is said with a tone of finality and total acceptance. Other pupils are more vocal in their statements ("we should use it in school more often", "we should use a lot more Internet"). Sites, which are referred to again and again, centre on games, music and chat rooms. On the whole there appears to be a grudging acceptance of Internet restrictions at school.

"Yeah! But some of the websites are banned like chat room".

(Girl year 9)

“Yeah! We do sometimes because we are not allowed to use it all the time and some of the sites are blocked“. (Boy year 9)

Some pupils have no desire to explore these avenues in a school setting. These pupils are already jaded by the limited delights on offer at school and have already explored far beyond them on their personal equipment at home. For them these little forays into “the forbidden zone” hold no interest. They have already travelled to far more interesting places within the comfort and safety of their own environment. Others simply withdraw their interest or in this particular case withdraw their physical presence altogether.

“We are not allowed to use the Internet in lessons... Like in IT lesson we just do what teacher tells us to do... Sometimes I skive the IT lessons because I don't like it as much. Its really boring. In school you are not really allowed to go on the Internet. There are some websites, which are blocked because I like to go on them all the time. So they don't let you on”.

(Boy year 9)

From comparisons of both the quantitative and qualitative data it can be deduced that the Internet is not fulfilling its role as a valuable learning tool in school. For the most part it is accessed by the pupils for leisure and recreational activities. True, this may well enhance social skills to a certain degree but, pupils obtain more direct information from other sources (i.e. books and classroom activities). Not only this, it would appear that they prefer to learn from other sources. This greatly puzzled the researcher as much is made about the virtues and simplicity of learning via the new technology. If Information and Communication Technology is supposedly so readily available, so simple to operate and so effective in terms of service delivery then why is it that pupils are still wary of using the computer as a learning tool? The researcher decided to probe further to see if

we could identify the perceived advantages of classroom activities with a qualified teacher and the usefulness of the more traditional approach.

9.8. Do (you) learn a lot about computers from your teachers?

Pupils were asked to evaluate how much they perceived themselves as learning from their teachers. All of the interviewees accepted that they attended school in order to learn (amongst other things) but the researcher was curious to find out how they evaluated the extent of that learning.

“No, not a lot because you learn most of the stuff from them. Because like some you do really know about that. But they do go over and over it again just to make sure. That and they will ask you questions on the subject to make we learn it. Sometimes they say same the things over and over again 4 or times. But I don't really find it boring like if they like explain it twice just in case I don't get it or somebody else don't get it. Just to make sure that I understand and other people understand as well”.

(Boy year 10)

This student was at great pains to point out that his teachers not only extend knowledge but ask pertinent questions in order to satisfy themselves that it has been absorbed. This would appear to be acceptable unless the message is delivered “over and over again”. For this student, who certainly appears to acquire knowledge quickly and competently, this reduces the level of interest in his studies in direct proportion to the amount of times that he is obliged to hear the message.

Another student is less confident that the message is getting through at all.

“You put your hand up and he just says I come in a minute, then he never (does)”.

(Boy year 10)

For other pupils this state of affairs is more complicated. It relies on many variables (i.e. prior knowledge of the subject or the individual teacher concerned) all of which play a strong role in influencing learning. For this girl the learning process is very much influenced by the teacher who is delivering the lesson.

“... If teachers get on your nerves you are not learning anything really”.
(Girl year 9)

Not all the teachers fall into this category as the same girl says that

“Some are all right. You can learn from them if you concentrate on them ... but if you don't get on with them it's not your fault. Is it?”
(Girl year 9)

However this is not always possible. It has become clear from previous interviews that the tutors' personality is a very strong factor in engaging interest and rendering the classroom assignments enjoyable. This should not be surprising. All can identify with the “favourite” teacher whose lessons are enjoyed and the irascible pedagogue who made certain lessons an ordeal to be endured, regardless of content. What does come across strongly in these interviews however, is the number of comments that repeatedly refer to staff in a negative manner.

The same girl states dismissively “I don't need teachers”. Many pupils have admitted to disliking their teachers but very few have claimed that they could just as easily learn their studies if the teachers were not there at all. With the ever-expanding market of home computing it is not surprising that increasing number of pupils are learning and extending sophisticated ICT skills within the comfort of their own room. It is likely that many pupils already possess skills which are for more complex to those which are being promoted in the classroom. For these pupils, the ability to play the games of

choice, send e-mails to their friends and participate in chat rooms is paramount at this stage in their life. This is an understandable state of affairs but one that may have implications on a child's future learning. If one already assumes (incorrectly) that one knows all there is to know regarding a set subject, the likelihood of ignoring or rejecting future opportunities becomes more than probable.

It is clear from the following interview that the onus for imparting knowledge lies firmly with the teacher.

“No, em...it is their job to like learning subjects to us but its up to the teachers if they can make it interesting to us. Like if they are in a nice mood, um... and they got nice personality and they will. If they are boring and horrible then you don't learn that much. Because they don't make it interesting to learn”.

(Girl year 9)

This is seen as the teachers' job. How it is done though makes a considerable difference to the amount of knowledge that is given and received. It is a common perception amongst all the interviewees who agreed to participate that responsibility lies firmly in the teacher's jurisdiction. There is no perceived collusion between student and teacher i.e. there is no mutual agreement to learn. The majority of pupils appear to regard themselves as empty vessels into which learning is to be poured with no responsibility or obligation on the part of the student to make a conscious effort to cooperate in this process. This appears to be the pupils' view, perhaps reflecting their interpretation of policy. This puts great pressure on the teachers; all is supposed to depend on them.

The teacher's personality is paramount in this process. The implication is that if the student does not “like” the teacher they will withhold co-operation and the exercise will fail. “Like” and “dislike” are subjective concepts at the best of times. In the

restrictive confines of the classroom such distinctions can easily become blurred by factors such as peer pressure (fear of being seen as “teachers pet”) or a general malaise as being kept inside on a sunny day. When asked if all teachers are the same this student grudgingly admits that they are not. However this is quickly qualified by the statement

“...We do learn from them but not a lot”. *(Girl year 9)*

Another student comments that

“...Teacher acts funny and people start laughing. We are not learning much. That's why I rather be here than in class”.
(Boy year 10)

Whether the pupils are laughing with the teacher or at the teacher remains unclear. The following interview shows that there appears to be an unspoken agreement of non co-operation that runs throughout the interviews.

“Teachers give us warnings. I don't really listen to them. Like sometimes I take knowledge of them but I don't listen to them and that's it really”.
(Boy year 10)

Clearly if there are no reprisals of any consequence for the reluctant student to participate then such participation will not be forthcoming. The enthusiastic pupils will always flourish, driven by their own dynamics to acquire knowledge and render the process enjoyable. For the bored and uninterested student, learning can easily become a distasteful chore that offers little pleasure or reward.

CHAPTER 10
THE UTILITY OF USING A COMPUTER

Chapter 10

Attitudes to the uses of computers

10.1. Introduction

Much of the research has concentrated on the formal factors of the use and value of computers including the amount of time devoted to them in schools and the way they are integrated, or not into the curriculum. Students know what is expected of them and have the same assumption that computers are beneficial that pervades the literature. In order to explore student attitudes further, to determine how elements of pleasure and enjoyment may influence perceptions of worth and value when using the computer as a learning tool there were further questions put to them. Time, as already mentioned, is a variable concept to each individual. Does time truly 'fly when you are having fun'? It was important to see how students regarded the use of their time spent at the computer. For this purpose the question was presented in a slightly different way from that asked previously but without varying too far from the script, in an attempt to probe a deeper level.

10.2. Do you think that using a computer is waste or a good use of time?

The question concerned opinions on the use of computers. Students could choose between parameters from "a waste of time" to "a very good use of time" with options between the two. This question was asked to see if students actually enjoyed their time generally whilst using computers.

Results in the following table (31) show that a very small number of students 2.9% responded with “a waste of time” and only 1.9% replied “a bit of a waste of time”. To a large extent, pupils understand the importance of computers.

Just 20 (15.2%) of all students replied “Neither a waste of time nor a good use of time”. These students do not appear to be interested in computers, or perhaps do not take computers seriously. The computer has either become so taken for granted in daily life that it has become inconsequential for the user and thereby invisible or else students are restricting their thoughts concerning ICT to the context of school, rather than home. They use it because they are told to use it by their teachers and don't necessarily have a positive or a negative view, remaining neutral on this matter. They could also realise both the positive and negative uses of computers.

The majority of students have a positive attitude regarding the time they spend using computers at any given location. 47.7% of students responded a “good use of time” and 32.3% replied a “very good use of time”. These are the types of student who not only have prior knowledge of using computers but use them to do their work in a conducive environment, and also know how to use the computer for recreation. All these factors could help influence their decisions. In addition they may compare it to the time spent in producing hand written work, so this shows them that it is a comparatively good use of time. Internet applications can also prove influential to their decision.

Table 31**Do you think that using a computer is: -**

Categories	Gender				Total of the sample	
	Boys		Girls			
	Frequency Of the (153)	Percentage (%)	Frequency Of the (157)	Percentage (%)	Frequency Of the (310)	Percentage (%)
A total waste of time	8	5.2%	1	0.6%	9	2.9%
A bit of a waste of time	4	2.6%	2	1.3%	6	1.9%
Neither a waste of time nor a good use of time	20	13.1%	27	17.2%	47	15.2%
A good use of time	56	36.6%	92	58.6%	148	47.7%
A very good use of time	65	42.5%	35	22.3%	100	32.3%
Total	153	100.0%	157	100.0%	310	100.0%

More boys have a negative attitude toward the time that they employ using computers. More boys (5.2%) than girls (0.6%) responded to the option “a total waste of time”. For the next option “a bit of a waste of time”, again more boys (2.6%) than girls (1.3%) reacted negatively to this. The reason for this may be that the girls take the computer more seriously and realize that it is stepping stone to help their future careers. Some boys by comparison appear not to take the computer quite as seriously. More girls (17.2%) than boys (13.1%) responded with a neutral attitude, with the option of “neither a waste of time nor a good use of time”.

A majority of girls (58.6%) as opposed to boys (36.6%) demonstrated their positive attitude towards the option “a good use of time”. Table 44, chapter 11 also reflects the same result, with more girls responding positively to the options e.g. “they make my work look better”. Boys think it is a good use of time but most of them think it is a very good use of time, and know how to use the computers resources to the full. As the results in the above table show, more boys (42.5%) than girls (22.3%) responded positively to computers being “a very good use of time”. Boys and girls both appear to have the same positive attitudes towards time spent in using computers.

10.3. Using computers can save time.

To confirm pupils' opinions regarding the time spent on using computers, another question was asked about time factors. This was to determine how much time can be saved by using computers. The aim of both questions was similar, but was posed in different ways, in order to make valid like the findings. This time asked a more specific question was asked, one in which the value to be considered (i.e. "time") was directly presented to the student and asked to be quantified accordingly.

The following table (32) shows approximately the same pupil attitudes towards the time factor. A Likert scale was given to pupils to rate their time scale. The majority of pupils think that they can save time by using computers, although they rate the time factor differently. 38.4% said that they can save a "great deal of time", 31.6% responded that, they can save "a lot of time" and 24.2% pupils replied "some time". The same percentage of pupils (2.9%) replied to the scales "a little time" and "no time at all".

Table 32

Do you think that by using computers you can save: -

Categories	Gender				Total of the sample	
	Boys		Girls		Frequency Of the (310)	Percentage (%)
	Frequency Of the (153)	Percentage (%)	Frequency Of the (157)	Percentage (%)		
A great deal of time	73	47.7%	46	29.3%	119	38.4%
A lot of time	41	26.8%	57	36.3%	98	31.6%
Sometime	26	17.0%	49	31.2%	75	24.2%
A little time	6	3.9%	3	1.9%	9	2.9%
No time at all	7	4.6%	2	1.3%	9	2.9%
Total	153	100.0%	157	100.0%	310	100.0%

A noticeable gender difference towards the use of time in school is found, as shown in the above table (32). More boys (47.7%) than girls (29.3%) replied that they could save a "great deal of time". On "a lot of time" more girls (36.3%) than boys (26.8%) concurred. Again more girls (39.2%) than boys (17%) replied to "some time". Overall,

approximately the same percentage of boys and girls said that they can save time when using computers.

One reason for some pupils thinking they can work faster may be because they use computers often and this saves them a lot of time. Another reason may be that they can save a lot of information quickly. The students who can not save time or save only a little time could be those who don't know how to use the computers appropriately and consequently end up spending a lot of more time on computers instead of finishing the job quicker.

10.4. Using a Computer is Exciting

So far we have ascertained that using computers may be pleasurable, useful and time saving. It would be interesting to discover if the students participating in the survey found any element of excitement to be present when using the new technology. To what extent do computers stimulate their audience and capture their imagination?

The results in the following table (33) show that only 23.2% said that they feel “very excited” when they use computers. 34.2% responded to ‘exciting’, 36.8% showed a neutral response and avoided positive or negative attitudes. The researcher observes that many pupils feel the same, irrespective of whether they can do their work, get a lot of information, work fast, save time or get better marks. It is obvious from the previous results that pupils like to play games and use the Internet and email. These factors can be exciting for them. Many games are very exciting and the Internet can provide a lot of entertainment for pupils as well as such essential factors such as emailing. Only a very

small number of students (2.6%) and (3.2%) expressed a negative attitude regarding feelings of excitement. The overall attitude of pupils is positive.

Table 33

Do you think that using a computer is: -

Categories	Gender				Total of the sample	
	Boys		Girls		Frequency Of the (310)	Percentage (%)
	Frequency Of the (153)	Percentage (%)	Frequency Of the (157)	Percentage (%)		
Very exciting	55	35.9%	17	10.8%	72	23.2%
Exciting	54	35.3%	52	33.1%	106	34.2%
Neither exciting nor un-exciting	33	21.6%	81	51.6%	114	36.8%
Not exciting	4	2.6%	4	2.5.0%	8	2.6%
Not exciting at all	7	4.6%	3	1.9.0%	10	3.2%
Total	153	100.0%	157	100.0%	310	100.0%

As shown in the above table there is a difference in the percentage of boys and girls responding to this Likert scale. 35.9% boys, (that is double the amount of girls) said that they find using computers very exciting. About the same percentage of boys (35.3%) to girls (33.1%) replied to “exciting”. Boys are found to have a tendency to do more entertaining things on computers (such as play games) than girls and to use the Internet applications more often. The results of this question reinforced the results of table 38 in chapter 11. More than half of the girls 51.9% showed their neutral attitude by responding to “neither exciting nor unexciting”. Of the boys, 21.6% answered to “neither exciting nor unexciting”. The overall results for this question show that the boys feel more excitement when they use computers than the girls.

10.5. Using a Computer is tiring

The next question “do you think that using a computer is tiring” was asked to determine whether, when using computers, pupils sometimes grow tired, perhaps because computing may be repetitive and may cause fatigue in the operator. Activities such as

playing games do not appear to make them tired. To see how pupils rate their 'tiredness', a five-point scale between "very tiring" and "not tiring at all" was created to assess the depth of feeling in greater detail to determine their responses. A sample of 310 pupils was used and all of them rated their preference according to their personal views.

A very small percentage of pupils (4.2%) said they found it "very tiring" to use a computer. Pupils (21.6%) responded "tiring". The reason for this may be that these particular pupils do not know how to use a computer and therefore feel frustrated and tired. However, this also applies to those who use computers a lot. If they use it too much they experience tiredness and discomfort in certain parts of the body which adds to their tiredness. The researcher used the questionnaire to explore different reasons for tiredness. Just over half of the students 52.9% said that they experienced discomfort with their eyes, then their neck and back i.e. they are already becoming aware of the technical, psychomotor problem inherent in ICT usage. Surprisingly, approximately the same percentage of pupils (18.4% and 18.7%) identified problems with their wrist and hands respectively. Others blamed monitors, the mouse, chairs and keyboard designs. However, none of them cited the swift passage of time spent in using ICT facilities, (time which is invariably lost count of when one is enjoying oneself), as a potential factor. Pushing oneself beyond the usual parameters of time and physical comfort is a condition which many may easily fall into.

30.6% of pupils said that they found it "neither tiring nor un-tiring". 25.2% and 18.4% responded to "not tiring" and "not tiring at all" respectively. Those pupils who felt this way may be the ones who do not spend too much time consistently on the computers or perhaps take regular breaks by listening to music or playing games.

10.6. Using a Computer is Important

The next question, “do you think that using the computer is important”, was asked to determine the importance placed on the different uses of computers in society. Many companies introduce faster and more compatible machines in order to promote their own business interests and government and educators are putting emphasis on using computers at all levels in education. The government is committed to all schools to being interconnected with the super highway and all teachers being ICT trained. In addition, parents believe that it is in their children’s best interest to be familiar with the use of computers.

The results in the following table (34) show that 86.5% agreed with this. The remaining sample of only 14.6% thinks that it is not important to use computers. The researcher was interested in determining whether students recognised the potential impact of ICT not only on their academic studies but also the future world awaiting them when they leave the comparative safety of the school. Pupils know they ought to like computers but that is not the same thing as liking them.

Table 34

Do you think that using computers are important?

Categories	Gender				Total of the sample	
	Boys		Girls			
	Frequency Of the (153)	Percentage (%)	Frequency Of the (157)	Percentage (%)	Frequency Of the (310)	Percentage (%)
Yes	134	87.6%	134	85.4%	268	86.5%
No	19	12.4%	23	14.6%	42	13.5%
Total	153	100.0%	157	100.0%	310	100.0%

At the time of collecting this information from different schools there were some pupils who did not have access to computers frequently who possessed the prior knowledge to use them effectively. Though 100% of pupils said they use computers, some of them may not use it often, or do not have a computer at home. This strengthens the later findings concerning boredom. These pupils could be from those schools where computers are not used properly, and whose computer equipment comprises old machines, which are not up-to-date.

The next question was given to pupils to know how they rate the importance of using computers in their life. In the above question a large majority of pupils said that they think using computers is important. From the results of the information presented in the following table (35) we see how they rate the importance of using computers.

Only 34.5% said that it's "very important" using computers. More than half 55.2% pupils responded to "important". Only 8.1% of the total sample replied neutrally by responding in the "Neither important nor un-important" field. This may be because they were thinking of computers when used in school. Alternatively they may be so familiar with ICT on a day-to-day basis at home that they take it for granted and rarely consider how they use them. They may simply not associate the concept of pleasure with "importance" at all. A negligible percentage of pupils, (that is 1.6% and 0.6%) replied to "not really important", and "not important at all" respectively. This implies that a vast majority of pupils think that it is really important to use computers in their daily life.

Table 35**How would you rate the importance of using computers: -**

Categories	Gender				Total of the sample	
	Boys		Girls		Frequency Of the (310)	Percentage (%)
	Frequency Of the (153)	Percentage (%)	Frequency Of the (157)	Percentage (%)		
Very important	60	39.2%	47	29.9%	107	34.5%
Important	80	52.3%	91	58.0%	171	55.2%
Neither important nor un-important	9	5.9%	16	10.2%	25	8.1%
Not really important	2	1.3%	3	1.9%	5	1.6%
Not important at all	2	1.3%			2	.6%
Total	153	100%	157	100%	310	100.0%

There is a mixed response between the genders on the “very important” and “important” scales in the above table. More boys (39.2%) than girls (29.9%) are represented in the “very important” scale. But for the “important” scale more girls (58%) than boy (52.3%) replied. The responses of the pupils for these rating scales coincide with the results of table 34. This demonstrates that students replied to both questions with the same attitude, which is clearly reflected in the frequency column. A very small percentage of pupils 1.3% boys and 1.9% girls replied to “neither important nor un-important”. For the next scales in the table “not really important” and “not important at all” there was a negligible response from both genders which is not crucial to the overall result. It shows that regardless of gender the overall outcome is a positive attitude.

In order to ascertain an accurate comparison of student views, the researcher introduced a number of “check” questions into the survey as a whole. This next question served a purpose in contrasting perceptions of “importance”, “usefulness” and “worth”. Should these last tables reflect any sizable variations as to view point or gender divide then the researcher must tread warily lest she read more than was intended into the respondents replies. The next question had the same weight as the previous question but different words like “important” and “worthwhile” were used just to get more reliable feedback

and to assess how the pupils rate their attitudes towards the value, usefulness and meaningfulness of computers, not specifically in school or home but anywhere, because there is no fixed position where a computer can be used. Approximately the same percentage of pupils showed their positive attitudes towards the usefulness of computers in their life, as demonstrated in table 43.

10.7. The Use of a Computer is Worthwhile

Table 36 shows that 29.4% and 54.5%, irrespective of gender, responded to “very worthwhile” and “worthwhile” respectively.

Table 36

How worthwhile is it to use computers: -

Categories	Gender				Total	
	Boys		Girls			
	Frequency Of the (153)	Percentage (%)	Frequency Of the (157)	Percentage (%)	Frequency Of the (310)	Percentage (%)
Very worthwhile	57	37.3%	34	21.7%	91	29.4%
Worthwhile	75	49.0%	94	59.9%	169	54.5%
Neither worthwhile nor un-worthwhile	17	11.1%	28	17.8%	45	14.5%
Not worthwhile	2	1.3%	1	.6%	3	1.0%
Not worthwhile at all	2	1.3%		%	2	0.6%
Total	153	100.0%	157	100.0%	310	100.0%

The researcher found that pupils understood the words “important” and “worthwhile” as an appropriate regarding use computer and responded to both questions positively. This implies that they understand how important or worthwhile using computers is in their lives but not necessarily the implications of being ICT literate.

10.8. The use of Computer is Helpful/Valuable/Important for their careers, and future life.

The last item was asked to see how the students think about the place computers for their careers, and future life. Does the computer enhance their lifestyle or is it perceived as a necessary evil in an ever-increasing technology? The rate of computer usage is growing, and computers are slowly expanding into everyone's life and into every profession. People believe the computer is the way forward for the future, and that computers will increasingly come to dominate business and social matters. The government now places great emphasis on all school-leaving children becoming fully computer literate before they enter the workplace.

The results in the following table (37) show that the majority of the pupils (62.6% and 32.6%) responded positively to "very helpful" and "helpful" respectively.

Table 37

How helpful is learning to use computers for your future: -

Categories	Gender				Total of the sample	
	Boys		Girls			
	Frequency Of the (153)	Percentage (%)	Frequency Of the (157)	Percentage (%)	Frequency Of the (310)	Percentage (%)
Very helpful	95	62.1%	99	63.1%	194	62.6%
Helpful	52	34.0%	49	31.2%	101	32.6%
Neither helpful nor un-helpful	5	3.3%	8	5.1%	13	4.2%
Un-helpful	1	0.7%	1	0.6%	2	0.6%
Total	153	100%	157	100.0%	310	100.0%

A minor gender difference is found in all parts of this scale. Of the boys 62.1% and 63.1% of the girls thought it was "very helpful"

10.9. Qualitative analysis validating the quantitative data

The researcher was determined to identify in what manner and for what students found the computer to be a useful and valuable learning tool. How indeed did they define the terms “useful” or “important”? Were they able to make a distinction between “useful” and “important” and, if so, would this be revealed in the interviews and backed up by the qualitative data?

During the following interviews students displayed mixed feelings regarding the usefulness of computers, both within the context of school and the world outside. Again the subject of computer games and music appear. These seem to be defined a being “useful” in terms of both being needed and used in themselves and a valid, even necessary, contribution to leisure and relaxation. Applications for work are regarded as a “spin off”, albeit a potentially useful one.

“Yeah! Because sometimes you can do your work and play games as well. Em...I prefer to play games on them and listen to music”.

(Boy year 9)

“No! it is not very useful all the time but it can be useful sometimes, like when you play games or listen to music”.

(Boy year 9)

There is a noticeable gender divide in this particular area. The girls interviewed appeared to demonstrate a much greater awareness of the role of computers in later life. One such student comments,

“Yeah it is useful. You can go on to the Internet. You can send things like e-mailing; playing games, things like that instead of writing”.

(Girl year 9)

Already she can see the potential advantages of electronic mail and applies this convenience to her social life in much the same way as other students text each other on their mobile phones.

Other students are less forceful in their opinion. Some regard the computer as a less than useful tool because of the way it is taught. These students clearly equate lack of learning with lack of usefulness. This is hardly surprising when one considers that IT is a lesson that can easily be dropped in favour of Drama Studies. Even the school regards the teaching of IT as being expendable if more favourable circumstances present themselves. If the schools appear to place little importance on IT the student will quickly receive this message. Other students are clearly battled by conflicting messages and are unsure in how to draw their own conclusions.

“Um...yeah you can say that but I don't know”. *(Boy year 9)*

Similarly another student says

“No, not really because you don't really learn much”.

(Boy year 9)

The gender divide is much more noticeable when students envisage the world of work.

“Um...yeah because like if you got a job and you need to use a computer. That's it really”. *(Girl year 9)*

“Yeah! A lot. You can start your work as secretary or something. You can em...its so much easier looking at the database in the computer than going through so many files. It saves you time”. *(Girl year 9)*

These students are already aware of the computer's potential for future career applications. It is interesting that these girls are already making assumptions about their future career paths and visualising how IT will feature in their new role.

“Um! I don’t know if its useful but it’s just not for me I guess. I don't think I could use it. I mean I come on it if I have to but if I had to come on every day? I don't like it because I don't really like computers. I don't know how to do computers properly”.

(Girl year 9)

Another student comments that,

“I don't know. I’ve just never been trusted with computers because usually something bad happens. Because I deleted my work two or three times then I had to do it again”.

(Girl year 9)

Other students demonstrate a reluctance to “come to embrace” this new technology. One student clearly associates IT with fear of failure and sees her difficulties in mastering IT as proof of her clumsiness.

This unfortunate experience would appear to be the exception rather than the rule. Other students grasp the potential benefits of IT both within the workplace and also as a positive aide to their study assignments. Interestingly, these students already view the computer as a friendly addition to, but not a substitute for, basic learning and have already learned to navigate those areas (i.e. search engines, spell check), which can support them in their studies.

“Um...well , not really but it is useful for homework because if you don't understand you can use a search place like Google and look it up. Most jobs now need basic PC skills and it's important to have a basic knowledge”.

(Girl year 9)

Most students comprehend that computer skills will play a greater role in the labour market of the future. Those who are lacking in such skills are those who are more likely to be left behind. Interestingly, the gender divide shows itself here quite distinctively. Most girls accept, even if grudgingly, that one’s career prospects are more rosy when

equipped with a relevant understanding of IT principles and they have a realistic appreciation of what those skills can help them achieve (i.e. higher work status and advancement prospects). Although, as will be borne out later in the survey, boys generally found using ICT more exciting and stimulating than their female counterparts they do not appear to be able to visualise the computer influencing their future life and career in any significant manner.

There is a world of difference between the words “useful and “important” and the students interviewed already instinctively understand this difference.

“Well! Yeah! it is, and it's a lot easier to use and a lot quicker as well but that depends on how good you are at erm ... using computers and that's really it basically for everything”.

(Boy year 9)

“Yeah! it is actually important to learn. But they don't teach you. I just talk to my friends em...I don't know”.

(Boy year 9)

One student makes the point that computers may act as a vehicle for knowledge but they are unable to function in the role of a teacher of knowledge. This is a subtle concept, not immediately grasped by the majority of students interviewed.

“I think em...its not that important. You don't really need them”.

(Boy year 9)

“Not much em...em... I don't know”.

(Boy year 9)

“I don't think that computers are so important. If computers are really important than why has our school got just 5 IT rooms? Why they are not in every classroom? Why don't we use them every day? I think computers are not really important. I could live without a computer”.

(Boy year 9)

The majority of students are not convinced regarding the importance of the computer within their own environment. Computers are seen as having certain uses and, indeed, as having certain advantages over more traditional methods of communication, but in the end they could be dispensed with should circumstances so require. Again, the amount of time allocated to computer studies is seen as a strong argument to support this view.

Once more girls predominate in envisaging a future in which IT plays a predominant role. Not all of these visions of the future are positive ones. Students have already learned that the “march of the machines” can ultimately lead to the loss of employment. If one is to control the machine one must first learn to understand. One girl in year 9 says

“Yeah! To get a good job because most of the jobs now are to do with computers. If you don't know how to use computers you might not get the job you want”. *(Girl year 9)*

Another student says

“It is very important because like before a lot of people have been em...their jobs have been cut because machines had replaced them and em...that's probably that's gonna happen even more now and people can control them and understand properly if they learn how to use computers”. *(Girl year 9)*

Students are aware that IT is progressing at a rapid pace. This does not, however, require them to enjoy or even respect this state of affairs. If one is struggling with a complex subject it is natural to feel overwhelmed and, to a certain extent, fearful of the shape of things to come.

“...Yeah it could be important because more things are becoming electronic whatever. But I don't like it. I can't work on it properly. I don't get it”. *(Girl year 9)*

Overall these students are not greatly convinced by the perceived status of IT when applied to their personal experience. Greater importance is still placed on more traditional ways of learning. Comparisons are made and conclusions drawn. Learning can still be easily accessed via conventional instruments of communication (i.e. newspapers) or recorded in a book. The revolution of Information Technology as so lovingly forecast in the 1960's has yet to filter down to or even excite the majority of students represented in this survey.

“No! Its not really important because If you got the news like you got the newspaper. You don't always have to go on the Internet to find out stuff. You have got various other things to occupy yourself with. You don't have to have the Internet”.

(Girl year 9)

From the following interviews it can be seen that there are many factors which can be construed as negative indicators for the less able or motivated student. These include the limited and repetitive applications of ICT, which are encouraged in classroom activities, the perceived lack of “instant feedback”, fear of coercion and bullying by a small percentage of students who are not confident in their abilities. Let us examine these views in greater detail.

When a question was asked directly concerning computers (i.e. do you like to use computers?) all of the interviewees replied in a negative fashion one way or another.

A boy, Year 9 replied,

“No, it's just boring. Some times I like it if its very nice work, but if its' just writing stuff and you are not working with your friends it gets kind of boring. When you are working with your friends you can talk about all different kinds of stuff and every one else can give their own opinions which makes it more interesting. When you are working with your friends its more enjoyable and when you are on your own you just get bored and don't do that much. Like in IT last year, we made a

calendar which was very good. When you're just writing like just typing stuff all the time it gets kind of boring. That's it really".
(*Boy year 9*)

Other routine tasks (i.e. writing) do not appear to rouse such negative responses. It would appear that it is not only the application of IT that produces such negative responses but also the restrictions placed on IT activities within a classroom environment. When pupils are involved in activities which are of personal interest to them. They are achieving something useful to them and producing their work by their own efforts. When they are given more mundane tasks to perform (i.e. practicing keyboard skills) the long term benefits of such activities are less obvious to them and the work is perceived as boring or repetitive. There is no immediate pay off or reward which is immediately obvious.

Similarly one girl (year 9) said that,

"No, I don't like ICT because I feel that when I go on to a computer I always get scared of em...like if I do a click it will delete all of my work. It would be better if we just wrote on paper. I never have been really good with computers. I just don't know why. I just don't like it. I 'd rather be with my friends than on the computers".
(*Girl year 9*)

The reservations which centre around uses of ICT are not always immediately apparent. Low self esteem and fear of failure can lead to establishing a repetitive pattern of non-achievement and resentment. For the most part we tend to avoid areas in which we do not perform well. This in turn leads to reinforcing negative feelings which are associated with the activity in question. There is a strong logic in this. "Because I have never been good at X activity", quickly becomes "I will never be good at X activity". A more useful approach would be "I can enjoy learning to be good at X activity". However, this is a message that should ultimately be delivered by the teacher rather than entrusted to the limited sophistication of the average ten year old to work out for themselves.

Without any hesitation all the interviewees told me “it’s boring and we don’t like it”. This shows that their preferred learning patterns are not associated with the use of the computers in school. Rather it is associated with friendship. They prefer to work with their friends but own an individual computer. They easily get bored without their friends in the classroom and do not like using computers to produce written information.

One of the consistent themes to arise from this survey is the sense of being “forced” to do things that have little interest or no immediate benefit for the students involved. Many pupils are already computer literate (indeed, of those that own their own equipment the vast majority will probably possess systems which are demonstrably superior than those encountered in the classroom) and feel that such activities as “writing” and “typing” are beneath their dignity. This type of activity may be perceived as doubly insulting when obliged to produce something in front of an audience of their friends. More emphasis is placed on outcomes (i.e. neatness, spelling, grammar and accuracy) than any pleasure in the activity itself and pupils are denied the ‘reward’ of a computer game or similar pursuit with which they would normally balance such activities at home.

“I don't really like it because I like music and different kinds of music. So when I work on the computer I feel like oh...(sigh) or feel like listening to some music or something like that em...”
(Boy year 9)

For people who prefer the emotion and creative freedoms of music and art, the discipline of the IT classroom can be a particularly exacting one. Such students relish the autonomy that the arts provide – a strong contrast indeed with the absolutes that exist within information technology. The easiest coping mechanism for such students is to retreat into a private inner sanctuary where they can play music ‘in their head’ yet appear to be

conducting the required activity within the classroom. It takes an astute teacher to recognize that such students are not merely plodders – they are simply not here at all in any real sense of the word. It would seem logical that students could be persuaded to take a greater interest if the system were more flexible. A musically gifted child would be drawn to websites or programmes that not only promote knowledge but also gave access to sound. Similarly an artistic child may gain hours of pleasure but not necessarily increase academic knowledge by accessing websites that present information and offer the practical applications of ‘photo shop.’

“No. It’s boring”.

When asked why, she replied ,

“um...because I don't know. Teacher makes it boring”.

When asked her how the teacher made it boring she replied,

“Because I don't like IT too much”. *(Girl year 9)*

“I don't like it. I can't work on it properly. I don't get it”.

When asked why she does not like computers she replied that,

“I don't know really, em...em... not. Why? I don't know because I usually can't just log on to my work. It just doesn't come up”. *(Girl year 10)*

“I don't like it; I would rather be with my friends than on the computers. Because you can't go on the chat room”. *(Girl year 9)*

Pupils appear to have no fixed concept of why they are ‘bored’. Possibly the tutor is inexperienced or the activities selected do not appeal to that particular pupil. Although younger children enjoy the process of repetitive and predictable behaviour (i.e. the traditional appeal of pantomime and fairy tales), by the time the child is approaching

puberty this is rapidly changing to “the shock of the new”. At a time when a child’s instincts are compellingly drawn to experimentation and the broadening of personal horizons the repetitive nature of classroom activities seems even more distasteful and unfulfilling. Obviously a girl can log on should she choose to do so. Whether or not she willingly chooses to surrender to the humdrum experiences she associates with it is another matter entirely. There can be a significant pay off for the individual being ‘unable’ to perform a task she does not enjoy! For a child who achieve little pleasure from social isolation the removal of chat room facilities and her circle of friends gives a great incentive in persuading her to expand her communications skills!

“Erm... No ICT Em...no, I would rather be here than in class. Because em...its just boring. Teacher acts funny and people start laughing. We are not learning as much. That's why I ‘d rather be here than in class”
(Boy year 9)

“Yeah, I do. Erm... I have started to enjoy it more because of the work we are doing now. It was a bit boring at the beginning. I just talked and didn't pay attention. I know more than I used to, so now I am more used to it”
(Boy year 9)

“Sort of. But em... I do not like the computers really”.

(Girl year 9)

“Um...yeah! But I don't like it. Because it’s computers. I usually rely on my dad to do everything”
(Girl year 9)

It came as little surprise to hear that pupil preferred to be interviewed than attend IT classes. The overwhelming picture that I gained from these interviews told of students experiencing difficulty in communicating ideas and receiving information within a classroom setting. How refreshing to converse with an adult who gratifyingly hangs on every word, and records one’s thoughts for posterity! What a contrast to the stultifying air

of the classroom where little exchange is encouraged or rewarded! One suspects that any escape from the classroom is welcomed. I choose my words carefully. More and more often the images of confinement against one's will, the lack of independence and the imposed boundaries on mental space will recur through out this analysis. I will refer back to this concept at a later point. One can only sympathise with the student who has taken the ultimate step in resisting this gross invasion of personal space and delegated all responsibility to her parent.

10.10. Conclusion

Both the qualitative and quantitative data gathered during the administration of this part of the survey supported the assumption that the gender divide is not only closing but showing every indication of reversal in some instances.

Table 33 shows us that 35.9% of boys as compared with 10.8% of girls found the computer to be "very exciting". However when we look at table 37 we find that 63.1% of boys found using the computer "very helpful". In the later case the gender divide is virtually non-existent, non-the less it is still observable. Why should there be such a discrepancy between this table and table 36? Perhaps girls define "exciting" in a different context than boys or, possibly, girls are more motivated by long term outcomes than immediate stimulation (i.e. excitement).

Knezek et al (1996) found no gender differences regarding computer importance, computer enjoyment, motivation, study habits, or creative tendencies at the first-grade level, and no consistent differences by gender were found at the second and third grade levels.

Forsey (1988) suggests that the use of computers is intrinsically motivating. He speculates that the source of this motivation is the freedom to explore and develop familiarity with the programme, and the lack of fear of failure. He also believes that an important aspect of the motivational element in the use of computers is that the child often knows at least as much about the software as the teacher.

However, it may not be fun for every student. It depends on pupils' interest in learning and many other factors such as time allocated for the use of computers in the schools, the availability of resources, and the pupils' prior knowledge of using computers. An emphasis on tasks is a very important factor in learning. The repetition of experience done poorly has been referred to as "drill & kill"! but it doesn't have to be that way. The challenge lies in finding ways into engaging activities that students want to perform. Computers intrinsically motivate pupils depending on the children's' interaction between computers and teachers.

Clay (1987) writes that:

"It shows the enthusiasm of the teachers and the joy of the children at having some control over their own success that has been most surprisingly replicated in each country". (p.37)

What this suggests is the old and unchanging axiom, that individual learning is appreciated. Pupils note the value and potential of computers. They understand their importance. The experience of computers in schools, however, is quite another matter.

CHAPTER 11

PUPILS' PLEASURE, INTEREST

AND

ENJOYMENT IN USING COMPUTERS

Chapter 11

Pupils' Pleasure, Interest and Enjoyment in using computers

11.1. Introduction

It is important to determine the amount of enjoyment that pupils associate with using computers and to contrast this with the amount of resources available to them (i.e. time and access issues). The way the computer is used in the classroom may very well influence pupils' responses regarding its usefulness as a learning tool. Perhaps the way computer studies is presented may influence the perceptions of students. Once again we return to the same issue. Is the message we wish to communicate the message that the student receives? It was first necessary to determine the students' level of interest in and enjoyment of using the computers and from there identify any patterns that may emerge.

In this part of the research a computer attitude scale was used to measure the pupils' attitudes and their feelings, (i.e. pleasure, enjoyment, interest etc) as a guideline to determine what they perceive as the greatest and least interesting aspects of computer usage in school.

The combination of these two facts i.e. the usefulness of the Web and the use of electronic communication may increase students' involvement in their chosen course and, as a result, serve to improve their understanding its content. However, this is very far from implying that traditional learning methods have become redundant.

11.2. The Degree of Pleasure, Enjoyment and Interest in using Computers for Different Activities

From the different studies it was clear that learners use the new communication media, e.g. e-mail and that they find it comfortable to work, think, learn and express themselves with. However there is little information regarding the pupils' feelings and attitudes towards these means of communication. Do they find computers pleasurable for 'chat' or for their studies? Do they know how to use the Internet and e-mail? How much pleasure, interest and enjoyment do they get when using the computers for different activities?

11.3. Pleasure in using Computers for Different Activities

The results in the following table (38) show the highest percentage of pupils (74.5%) responded positively to the question "playing games". As most pupils enjoy games, playing games on the computer should be engaged equally, if not more. 74.5% of the whole pupil majority agree even though there are slightly more boys (77.1%) who like games. One reason for this may be that most of the games manufactured are mainly for boys, (i.e. football, fighting and shooting). Girls are starting to appear in these categories, leading to more girls playing the games. However this must be set in the appropriate context of school, where there is little opportunity to "play games" at all.

Table 38

Do you find using computers pleasurable when using them for: -

Categories	Gender				Total of the sample	
	Male		Female		Frequency Of the (310)	Percentage (%)
	Frequency Of the (153)	Percentage (%)	Frequency Of the (157)	Percentage (%)		
"Using them for work"?	34	22.2%	33	21.0%	67	21.6%
"Using Internet" on them	110	71.9%	107	68.2%	217	70.0%
"Playing games" on them?	118	77.1%	113	72.0%	231	74.5%
"Using E-mail"?	79	51.6%	91	58.0%	170	54.8%
"Chatting" (chat room on the Internet)?	78	51.0%	82	52.2%	160	51.6%

The majority of pupils (70.0%) find using the internet “pleasurable”. It is a different kind of entertainment which they can acquire from the comfort of their own home and privacy. This pleasure be absent within a school environment. The pupils who do not find it pleasurable to play games on computers claim to find the games frustrating, tiring, time consuming, difficult and sometimes downright boring, due to the nature of the games.

More than half of the pupils (55%) are fond of “Using e-mail” and “Chatting” respectively. There are more girls in both of these categories (58% of all the girls responded “using email” and 52.2% of the girls responded “Chatting”). 51.6% of all boys responded to “using email” question, and to the “Chatting” question. This is because girls spend most of their time chatting in and around the home to friends when boys spend most of there time playing sport with friends. This leads to the same conclusion on the internet exercise. Where the emphasis is on speaking; more girls are represented, where the emphasis is on more action, more boys are present.

However, there is still a small anomaly between males and females. Recent research shows that for all the given choices, girls were more or less the same in percentage as boys, which shows a increased involvement of girls over the years. In the past, girls were seen as passive in their relationship with the computer, but now they are beginning to show their interest and this is reflected in the results. Many believe that the use of the Internet is the future of education, and government directives such as the NGfL would appear to support this view. Given the ubiquity of the games and the uses of the internet, the presences of such a proportion who do not find the opportunities pleasurable is surprising.

The reasons that certain students do not feel any source of pleasure may be due to the fact that some students do not use the Internet or e-mail at all. Poling (1994) found that some students never use their e-mail system. Some students might not even know how to use the Internet and e-mail, especially if they rely on the communicating by mobile phone. Those students who have not contacted or interacted with it at school or at home often make an assumption that these are difficult skills to acquire. Descy (1997) presents two consequences for educators, students and others using the Internet. These consequences are related to: -

- Privacy issues;
- The application of information found on the Internet. (p.49)

Concerning privacy matters, many teachers and students are not confident about the privacy of e-mail so they hesitate to use this. This is a significant factor, both in terms of security and trust. Descy (1997) observes that most teachers and students equate an e-mail transmission to a regular 'Snail mail' letter and also believe that it is a confidential transmission written by the sender and legally read only by the receiver. Once it is deleted, it is thrown away forever. He also explains that teachers and students should be aware that e-mail is not the sole property of the sender or the receiver.

Descy further explains that students and teachers should also be aware that transmissions probably do not disappear when they are deleted. Most government agencies do not feel confident that a document is safe from resurrection until that part of the disk is overwritten at least three times. However, even if the disk is overwritten many times, the transmission may still be readable.

Poling (1994) records that for the majority of the students who have never had the opportunity to use an e-mail system it can be a challenging and frustrating learning experience.

11.4. Enjoyment in using Computers for Different Activities

As Justin et al (1988) indicated, computer access can improve attitudes towards computers for most high school and college students (p61). Knezek (1996) in a study conducted on 'Information Technology from the Child's Perspective of Grade 1-3' observed that computer enjoyment trends appear to depend on familiarity rather than novelty.

“Young children with computer experience in school will tend to have higher attitudes towards computers than young children without computer experience in school”. (p.81)

This study was conducted with children in Grade 3 1-3 and they expressed their attitudes and feelings towards the use of computers. In contrast, the present research is conducted on high school children of years 9 and 10. A significant problem for research into ICT and attainments is the frequent mismatch between the methods used to measure anticipated gains and the nature of the learning which is promoted by different ICT environments. In other words, researchers have often measured the “wrong” things, looking for improvements in traditional processes and knowledge instead of new reasoning and new knowledge which might emerge the ICT use. Underwood et al (1994) observe that many programmes used in the class are not challenging enough. As illustrated in the following table (39) only 6.1% of the pupils responded “very enjoyable” and 9% said ‘yes’ to “enjoyable”.

Buckingham (1999) noted that computers in school were largely used for word processing, an activity which many children found time consuming and boring. Mumtaz (2000) found that one particular student reported being so bored during a word processing activity at school that he started sending e-mails to himself! As shown in the following table (39) a large number of pupils (61.6%) responded to “neither enjoyable nor un-enjoyable”. These are the pupils that use computers frequently and have a fairly average amount of knowledge of how to use a computer. For them, working on a computer is just a natural extension of themselves and a routine of school. Only 7.4% and 5.8% responded “not enjoyable”, and “not enjoyable at all” respectively. These pupils are the ones who feel they are being forced to do it. They may not have much knowledge about using computers and are scared they might fail an exam on computers if they do not learn.

Table 39

How do you find using computers in school: -

Categories	Gender				Total of the sample	
	Male		Female		Frequency Of the (310)	Percentage (%)
	Frequency Of the (153)	Percentage (%)	Frequency Of the (157)	Percentage (%)		
“Very enjoyable”	11	7.2%	8	5.1%	19	6.1%
“Enjoyable”	28	18.3%	31	19.7%	59	19.0%
“Neither enjoyable or un-enjoyable”	93	60.8%	98	62.4%	191	61.6%
“Not enjoyable”	11	7.2%	12	7.6%	23	7.4%
“Not enjoyable at all”	10	6.5%	8	5.1%	18	5.8%
Total	153	100.0%	157	100.0%	310	100.0%

The significant finding of 61.6% students who find computers neither enjoyable or un-enjoyable must surely give us pause. Are these students bored, apathetic or simply comfortable using the computer and view it as simply using a familiar. These students might not have computers at home and might not come to school with prior knowledge of computer use (or come with very little knowledge).

Slightly more boys (7.2%) than girls (5.1%) reported that they find using computers “very enjoyable”. The second option “enjoyable” attracted slightly more girls (19.7%) than boys (18.3%). Only 7.2% boys and 7.6% girls responded to the “not enjoyable” category, 6.5% boys, and 5.1% girls responded to the “not enjoyable at all” respectively.

Both boys and girls showed almost the same positive and negative attitudes towards the use of computers in school. This would appear to indicate that the gender divide of previous studies is rapidly being eroded as more and more girls gain access to computers. Today, parents might agree that a home computer is not merely a recreational tool but also a valuable learning tool when it comes researching and producing informed homework assignments. For most parents, attitudes to gender issues regarding computer use have never been nor or are likely to become an issue. It is therefore not at all surprising that, as more and more families are able to buy a computer for the home, these attitudes should be reflected in the schools that their offspring attend.

In this study the researcher found that not all the students said ‘Yes’ to ‘enjoyable’, as shown in the table 39. The majority of them said ‘neither enjoyable nor un-enjoyable’. This implies that all students who use computers at in, school or perhaps at home do not find using computers very interesting. They are part of a routine, something taken for granted.

11.5. Interest in using Computers for Different Activities

The attitudes of pupils towards using computers varies due to different factors such as classroom environment, the time available, the availability of machines and the teachers’ methods of instruction. The pupils’ interest in computers may also be influenced by the socio-economic conditions of the schools (i.e. less money in the budget means less

equipment to access). The results show that there is an increased interest in pupils towards the use of computers as shown in the following table (40).

Concerning the question “do you find computers interesting in school?” Results indicated that the pupils who said ‘yes’ were at a percentage of 41.6%. The preferred answer to “do you find computers interesting in school” was clearly ‘No’, with a percentage of 58.4%. More than half of the students find it boring. Requiring more data for analysis, the researcher asked whether the students were interested even if they did not find computing lessons enjoyable. The researcher decided to compare qualitative and quantitative analysis and sees what, if any, disparities presented themselves.

Table 40

Do you find using computers "interesting" in school?

Categories	Gender				Total of the sample	
	Male		Female		Frequency (f)	Percentage (%)
	Frequency Of the (153)	Percentage (%)	Frequency Of the (157)	Percentage (%)		
Yes	66	43.1%	63	40.1%	129	41.6%
No	87	56.9%	94	59.9%	181	58.4%
Total	153	100.0%	157	100.0%	310	100.0%

One would expect computers at least to be interesting, to offer a contrast with the rest of the school experience, but in this perspective, the response is disappointing. Next question was devised to test the validity by contrasting results with an attitude scale.

Pupils that find it “interesting” and “slightly interesting” on the scale are the ones who probably do not use computers much and do not completely enjoy the experience. Pupils who find it “not interesting at all” are the ones who go on the computer for games only. This makes work (a control to the games) appear boring to them. If a person ... all kinds

of tasks on a computer, work will also be interesting, but for those who only use the computer to play games work will be not interesting at all.

Table 41

How interesting is using computers in school: -

Categories	Gender				Total of the sample	
	Male		Female		Frequency Of the (310)	Percentage (%)
	Frequency Of the (153)	Percentage (%)	Frequency Of the (157)	Percentage (%)		
“Very Interesting”	9	5.9%	4	2.5%	13	4.2%
“Quite Interesting”	8	5.2%	8	5.1%	16	5.2%
“Interesting”	50	32.7%	58	36.9%	108	34.8%
“Slightly Interesting”	42	27.5%	41	26.1%	83	26.8%
“Not Interesting at all”	44	28.8%	46	29.3%	90	29.0%
Total	153	100.0%	157	100.0%	310	100.0%

In this question as shown in the above table (41), more boys chose “very interesting” and “quite interesting”. This may be because boys are mainly outside for most of their time leaving no time free for computer use, so in school when they get a chance to use computers they make the most of it. In the past boys have traditionally used computers more than girls and girls have expressed little interest. In the “interesting” category most of the students concurred but more of these were girls (36.9%) as compared to the boys (32.7%). The responses to these choices coincide with the results in table 40. Most of the pupils that responded “slightly interesting” are boys, but in the “not interesting at all” choice the girls’ numbers are greater.

The next question asked was, ‘in which period do you find using computers most interesting?’ This could be regarded as a “trick question” by those who professed not to find computers interesting at all! This question was created to see in which place the students find using computers effectively and in the most interesting manner. This is

asked because students have been found to be using computers in different times and places for different activities.

Table 42

In which period do you find using computers most interesting: -

Categories	Gender				Total of the sample	
	Male		Female		Frequency Of the (310)	Percentage (%)
	Frequency Of the (310)	Percentage (%)	Frequency Of the (310)	Percentage (%)		
“During ICT lessons”	69	45.1%	101	64.3%	170	54.8%
“During other lessons”	20	13.1%	11	7.0%	31	10.0%
“Between lessons”	1	.7%			1	.3%
“After school”	38	24.8%	27	17.2%	65	21.0%
“In computer clubs”	25	16.3%	18	11.5%	43	13.9%
Total	153	100.0%	157	100.0%	310	100.0%

The results show that the bulk of students (54.8%) said that they like to work “during ICT lessons”. This may be because they have to study ICT as a part of the curriculum or as a compulsory subject in some schools. They may think that if they don’t take an interest in computers as a whole they will not pass important tests that they take later in the curriculum year.

The category which comes after “during ICT” is “After school” which shows a percentage of 21% which is just over one fifth of the total students. About one fifth of the students stay after school, and all of these like it because there are no deadlines involved. They can take their time when doing work and make the most of the time available. Most stay for playing games. These students may be the ones who do not have a computer at home or those who are really fond of them. The next in line of percentage is the “In computer clubs” (13.9%). This only scores 14%. About 20% of students go to a computer club and in these computer clubs pupils cannot do anything they want because they are

still supervised, and are probably not allowed to play games. Things such as activities on the Internet can be fun for only a certain amount of pupils. Not all pupils want to give up time to go to a computer club.

The next choice that the pupils chose was “during other lessons”. This equates to 10% of pupils. This may be because in other lessons they get a chance to use the computer and if they do, it may give them access to interesting material. For “between lessons” only 1 pupil responded positively. Between lessons are only available for older students (e.g. GCSE students or 6th formers), but only a few students from these actually use the computers because of timetabling restraints.

The gender difference in the results the table 42 shows a fairly large divide for all the choices. There was a larger ratio of girls (64.3%) to boys (45.1%) in the “during ICT lessons” choice which is statistically significant. These girls appeared to have a different attitude to work and know that in order to be successful in tests and examinations it helps to enjoy using the computer. For the “after school” choice there were more boys (24.8%) than girls (17.2%) This may be due to boys not doing the amount of work in class and so ending up staying after school to do it. They also enjoy staying for social reasons. The lack of girls represented may be because after school there are few teachers to help supervise them, and sometimes parents don't like their daughters staying after school.

The next choice is “in computer clubs”, to which more boys (16.3%) than girls (11.5%) responded. On the whole boys like to come earlier to play, or perhaps stay later in school and therefore have more time to go to the computer club than the girls, who usually come

in on time and go home on time at school. The percentage of girls that did say “yes” are the ones who use computers in dinner times or break times.

The next choice was “during other lessons”, and again there were more boys (13.1%). This time the percentage of girls was only 7%. Overall reason for this appears to be that in some schools pupils do not use computers in lessons other than ICT. For “in between lessons” there was only one boy and no girls. This particular boy had fewer subjects to study and accordingly had more spare time. In order to confirm the results of the above question the next question was asked with the same choices but was phrased in a different way (‘least interesting’). As shown in the following table (43) most of the pupils (59.4%) said that they find using computers least interesting “in other subjects” or “During other lessons”.

Table 43

In which period do you find using computers least interesting?

Categories	Gender				Total of the sample	
	Male		Female		Frequency Of the (310)	Percentage (%)
	Frequency Of the (153)	Percentage (%)	Frequency Of the (157)	Percentage (%)		
“During ICT lessons”	31	20.3%	29	18.5%	60	19.4%
“During other lessons”	89	58.2%	95	60.5%	184	59.4%
“Between lessons”	0	0%	0	0	0	0%
“After school”	20	13.1%	17	10.8%	37	11.9%
“In computer clubs”	13	8.5%	16	10.2%	29	9.4%
Total	153	100.0%	157	100.0%	310	100.0%

Pupils do not like working with ICT during other lessons. It was found that pupils found having to work in large groups really frustrating because they cannot access the computer individually.

The next choice the pupils (19.4%) nominated to be least interesting is “during ICT lessons”. This answer seems to be in contradiction to the previous question, but this may reflect the opinions of those pupils who do not like ICT as a whole and who probably do not have a computer or have the prior knowledge to use one. Additionally, it could be attributed to the classroom environment of because staff give out instruction sheets which may be complicated and difficult for pupils to understand.

“After school” was the next choice at 11.9%. This may be because students are made to stay after school if they haven’t finished previous work in class. However the percentage is low because this only happens to a few pupils.

Only 9.4% pupils responded that they find using computers least interesting in “computer clubs”. This may be because they are not allowed to use the computers for their own amusement but are set a target by the teacher which leaves them little time to use the computers for recreational purposes. None of the students responded to the “between lessons” choice. This suggests a lack of opportunity.

Cuthell (1999) found that 80% + of staff agreed that students’ work was improved by the use of computers (i.e. legibility, organisation of work and presentation are the main areas of improvement). 44.6% of teachers responded that the improvement in terms of marks ranges between 0-50% of age students KS 3, KS 4 and 16+. 78% of teachers said that the use of computers has had a positive effect on students’ work and 72% said that the use of CD-ROM drew a positive response regarding the improvement in information seeking. However the integration of information into the students’ work was limited. It is possible that these are the teachers’ perceptions towards the pupils’ use of computers and improvement in their work which are not consistent with the pupils’ own point of view.

Teachers tend to think in their own personal style of teaching. This is not necessarily the thinking of the pupils they teach.

The emphasis here is on pupils' perceptions. Cuthell's study mentioned that one of the students' commented,

“Now I use my computer for the work I do apart from Maths and things like that...I think it makes homework lot easier because of the different programmes”. (p.27)

The results in the following table (44) indicates that the least number of pupils answered “Yes” to finding computers “interesting for work”, with a percentage of 35.8% (which is over a third of the students). This is probably attributable to the fact that only a certain amount of pupils can actually use a computer in a normal way. These are the pupils that actually have a computer at home or have experience of one. Another factor, which also influences the decision, is that some pupils prefer not to use the computer for work purposes at all. However, the majority of pupils (77.1%) like playing games as demonstrated in table (38). The reason that there were a lot of people answering “No” is because they would rather play games on the computer and do work by hand.

Table 44

Using computers is interesting in school because: -

Categories	Gender				Average	
	Male		Female		Frequency Of the (310)	Percentage (%)
	Frequency Of the (153)	Percentage (%)	Frequency Of the (157)	Percentage (%)		
"I can do my work"	58	37.9%	53	33.8%	111	35.8%
"I can work fast"	58	37.9%	69	43.9%	127	41.0%
"They give lot of information".	53	34.6%	61	38.9%	114	36.8%
"They give me different information than I can get elsewhere"	39	25.5%	40	25.5%	79	25.5%
"They make me think differently".	21	13.7%	16	10.2%	37	11.95
"I can get better marks"	51	33.3%	36	22.9%	87	28.1%
"They make me work look better"	64	41.8%	93	59.2%	157	50.6%

One of the students in Cuthell's study mentioned that:

“I find it a lot quicker to write up on a computer, and find it much easier to write as it all just flows out”. (p.28)

In his study the response of another student to the same question is contradictory.

“Computers can make home work need a lot more time, even if you're very good using them, because you end-up spending a lot of time tweaking your work”. (p.27)

In the present study only 41% of the pupils responded to this question by answering “Yes” to using computers because they can “work fast”. The reason behind this is that when pupils use computers frequently they start to build up speed, so they end up having a greater speed than their normal handwriting.

Lacy & Wood (1993) comment that an individual using their experiences as a foundation can construct knowledge from Internet representations. In learning activities, knowledge is based on individual constructions that are not tied to any external reality, but rather to the learners' interaction with an external world.

In this study the same type of question was put to students about getting a lot of information from computers. The above table (44) indicates that only 36.8% responded “Yes” to this. This may be because these students already have prior knowledge obtaining information either from a computer or from other sources such as books and teachers. Marginally more girls (45.2%) said they could obtain a lot of information from computers than boys (41.2%). Obtaining information is a slow process in which a lot of patience is required. A large majority of pupils admitted to not being able to obtain a lot of information from a computer. If a pupil cannot obtain information from computer

resources such as the Internet, software, CD-ROM there must be some important barriers in the way.

Pupils were then asked if the computer gave them different and more information, which they would otherwise have to obtain from a larger range of sources elsewhere. This question was explored in the pilot study interviews, whether they obtain more information from sources like teachers, books and friends than computers. Many of them replied that they get more information from computers than other sources.

The result of the pilot study interviews (qualitative) and the questionnaire (quantitative) are consistent. Only 25.5% responded “Yes” to this question as shown in the above table.

The pupils who said “yes” could be ones who know a lot about computers and can obtain a lot of information from software packages, CD-ROM, Britannica, Encarta and other sources such as the Internet from which they can collect information from a wide range of sources.

Another choice is if “computers make you think differently” (i.e. using creative problem solving skills and think laterally). This question was asked to see if pupils think creatively when using a computer, getting new ideas from the best of the computer resources, which can be reflected in their work.

Only 11.9% of pupils replied “Yes” and a large majority said ‘No’, computers don’t make them “think differently”. The reason why 12% said yes is that when they use the computer they enter a different frame of mind and use the computers resources to help them reach their best ability, meaning more efficient work is done with this new focus.

However the vast majority answered negatively to this question, perhaps because they see the computer as any other source and do not know that the computer has limits in usefulness. In this question there were slightly more boys (13.7%) than girls (10.2%) who said 'Yes'.

Another choice was devised to establish how pupils see the computer helping their presentation. To this question only 50.6% pupils responded that the computer helps their work to look better. The reason they said 'Yes' was because their current presentation wasn't at a high level so the computer improves it. The other factor that makes them say 'Yes' is that they know how to use the computer to its full potential, meaning they can bring in pictures, colours and even different fonts with the use of other software, thereby enhancing and extending their present skills. More girls (59.2%) than boys (41.8%) said "yes". This is a surprise because girls usually have an overall better handwriting standard and many of them admitted to being not fond of computers. However they still think that the computer helps them to improve their presentation and make things look better.

The study conducted by Cuthell (1999) indicated that students recognise the importance of presentation, although they distance themselves from saying directly that they will earn more marks for it. He is aware that the medium and the message are closely intertwined. One of the students in his study, regarding the better marks and difference in thinking while working on the computer said

“...I do find that I do get better marks when I use a computer for my work but I think this is because when doing work on the computer you think about what you're doing more”. (p.29)

However the result of the present research reflected a very low percentage of pupils who responded that they find using computers interesting because they can get better marks. Of the 33.3% boys and 22.9% girls responded to this statement. Even although most students who use computers in annual tests get higher marks, these pupils still reflect their answer to be “No”. This may be due to the fact that they are not confident using the computers in tests.

The researcher then considered pupils’ interest, motivation, pleasure, excitement, enjoyment and their whole attitude towards the use of computers. Only 35.8% pupils said that "they find using computers interesting in the school because they can do their work" as mentioned in the pilot study questionnaires and interviews. Most of the students like to play games and enjoy working on the computers on their own at school. Pupils are not allowed to use computers for playing games at school. They use computers for other activities related to their subjects. Previous research confirms this.

This has been supported by both the qualitative and quantitative data sourced throughout this survey. Interest, access and enjoyment are mutual factors which support each other in stimulating student perceptions. All of these must be present if students are to perceive the computer as anything more than a sophisticated tool for recreational activities, and one that is a poor substitute for one’s friends.

11.6. Qualitative Analysis: - Computers Considered being Interesting or Boring or enjoyable?

At this point the pupils were asked whether they found using computers to be interesting or otherwise. This promoted a great deal of surprise and some laughter. Two of the girls admitted that they found computers interesting, two were non – committal but the vast majority of pupils (86%) expressed a negative and dismissive view of IT lessons, both in terms of subject and also the manner in which they were conducted. Often the pupils felt that the teachers were indifferent to the individual needs of pupils and uninterested in adapting the lesson for individual learning styles.

It was considered important to obtain responses in a variety of different ways (i.e. phraseology and repetition) in order to generate enough information for an accurate comparison of qualitative and quantitative results. This approach made it more likely that students would reveal their true feelings by contrasting previous answers with similar questions asked later in the survey.

The interpretation of the word “interesting” means different things to different people as, indeed, does the word “enjoyable”. To what extent did students confuse these connotations with each other? Did students perceive them as truly interchangeable or was there a plain difference (if only a subtle one) in students’ concepts of these and similar emotional states?

It was decided to gather first evidence regarding student degrees of interest before proceeding to explorations of enjoyment and usefulness.

“I am all right being here because I find IT boring and all the work we do is boring because we do the same stuff every week...I just came from IT is bit boring that’s why I am here actually...I find it boring because it’s not interesting to learn the same things every week. I don’t know why we have to learn the same things again and again...” (Boy year 9)

It would appear from this that educational websites leave much to be desired in terms of attractive design and actively.

Another student states that

“No, its just boring. I am so happy that I am here because I don’t like it”. (Boy year 9)

The onus, it would appear, is on the pupil if they wish to create an atmosphere that is more conducive to learning and that can demonstrate acceptable results to their teacher. By concealing the ‘actual’ work (i.e. looking at cars on associated websites) and bringing up a site that is more in keeping with the teacher’s expectations of the lessons in hand the student is able to score a moral victory for himself in the contest between authority and autonomy yet still gain approval from his teacher.

Many pupils seem to have resigned themselves to a regime of endless repetition and frustration, which offers little in the way of personal benefits and reward. Although there are pleasure, there are heavily outweighed by the monotony of the subsequent lessons. Which of the memories they takes with them into adulthood are likely to be the most powerful?

It is not that boredom in itself is intrinsically dangerous (although the possibility of not noticing a harmful act or threat because the mind is engaged elsewhere from ones

physical environment can be a real consideration), rather than boredom, by its sheer innocuousness, can strangle the desire for knowledge and replace stirrings of interest with a lacklustre approach and sense of personal failure.

“You don't really learn much. Um...I am not really happy about it. I don't think it's good at all. It just annoys you. You really need to get help from other people”.
(Boy year 9)

“You can't just talk to your friends on a computer because it will be boring and not every thing you want to know is on the computer. You have to go to the library and read the books if you want to get all the information”.
(Girl year 9)

When she was asked why she finds the using of computers so boring she wasn't sure whom to blame. After some hesitation she just blamed her teacher and said that,

“Um...because I don't know. Teacher makes it boring”.

In order to explore it more the student was asked how does the teacher make boring?

“Because he tells us to do something and if you don't understand it he doesn't help you. He wastes your time... We do the same things every week and it is really boring and the work, which we are doing, is meant to be in year 10 and we are doing it in year 9”.
(Girl year 9)

From this it would appear that her teacher is not “boring” himself, rather that the learning materials and delivery style are jaded.

“No. Not really, because we don't really do anything that much except for looking up video and presentation things and we are not even meant to be doing that in year 9. It's really boring and hard”.
(Girl year 9)

“...It's just boring. Teacher acts funny and people start laughing. We are not learning much. That's why I would rather be here than in class”.
(Boy year 9)

These pupils are already starting to express resentment at being trapped within an environment that is not of their choosing or of their liking. One girl is unable to make the

teacher hear her call for attention because the teacher is too busy. The teacher is too busy shouting loudly at the other pupils. She requests a guide in her search for knowledge and instead is pointed towards the dark undergrowth of neglect before being dismissed altogether. In contrast, another pupil is unable to access the knowledge he seeks because the teacher is more concerned with establishing a good rapport with his 'pupils'. So intent is he on being friends with everybody that nobody receives the stimulation they require. Yet, most of these students enjoy computers out of lessons with their friends instead of gathering knowledge from computers and teachers in a classroom environment. Why is this enthusiasm and desire for knowledge so consistently glossed over in the classroom and replaced by the very strategies and processes that may harm a child's interest and curiosity.

Some pupils express themselves to be neither very interested generally nor find using computers interesting. Their words and their tone of voice are congruent with a submission to the routines of school. There is one heartfelt positive statement below when a pupil describes how his teacher offered assistance without being first requested to do so, but he soon added.

“Sometimes it is boring and not interesting...”

(Boy year 9)

11.7. Conclusion

The fact that pupils so often express boredom is worth commenting on. Does this suggest a change in future delivering of IT within the classroom? The experiences and comments of those agreeing to be interviewed demonstrate no such belief; in fact many of them do not seem able to believe in even the possibility of change, let alone its implementation.

Cullingford (1999) states that,

“It is a typical response to the demands of learning not to pursue an understanding of the whole but to specialize and set up boundaries. If the information is too great it cannot be controlled. But the first academic discipline is to choose which are the most relevant facts in a vast array of information”.
(p98).

Perhaps the second academic discipline should be to present the facts in an environment that rewards interest and stimulates the recipient?

A state of boredom by definition must stifle any potential feelings of enjoyment in the subject in hand. Let us explore this concept a little further. This student clearly feels restricted by the lack of stimulation resulting from exchanging ideas and suggestions with his peers. These would appear to be little recognition of different learning styles within the classroom, although one can sympathise with the needs of the tutor who has limited time and resources available with which to inspire their charges.

“No. Its just boring. Because when you are working with your friends you can talk about all different stuff and every one else can give own their opinions that's like makes it work better. When you are working with your friends its more enjoyable and when you are on your own you just get bored”.

(Boy year 9)

“We are not allowed to use computers in our free time...”

(Girl year 9)

Again, one must sympathise with the schools that are pressed to provide appropriate resources with insufficient funding and an acute shortage of staff. It would be foolhardy to allow students unlimited access to computers if there are no staff available to supervise them when they do so. However, this lack of access and the possibilities it may offer of

learning in a manner more immediately satisfying to the students' personal taste and preferences only serves to reinforce negative attitudes already surrounding ICT studies as a whole.

CHAPTER 12

ICT IN THE CONTEXT OF PUPILS'

USE OF AND ATTITUDES TO

TIME SPENT IN SCHOOL

Chapter 12

ICT in the context of pupils' use of, and attitudes to, time spent in school

12.1. Introduction

As demonstrated in the previous chapter, both the qualitative and the quantitative data indicate that far from valuing the use of computers in learning activities, most students participating in this study state “school as a waste of time”. They certainly do not perceive ICT to be either useful or important and appear to have little inclination to change this point of view by introducing ICT into their daily activities.

This poses the question-just what are students using their time in school to achieve? To examine this and reveal their attitudes to school in more depth the researcher decided to find out how much work is actually achieved over an average school day and how students spend their time at school outside of the classroom.

As will be seen from the qualitative and the quantitative data gathered earlier in this survey there appears to be some confusion over learning activities and opportunities within the school timetable. Students responded with a variety of contradictory statements, and it is important to resolve these anomalies before entering new territories.

What have we been told so far? Firstly, that students do not say that they learn from either using the computer or from instruction by their teacher. In addition to this they gain a very little enjoyment from using the Internet or playing games on the computer.

Secondly we are informed that they (the students) are not allowed to access the Internet or play computer games. We are also led to believe that variances in teaching styles may prevent successful communication from teacher to student and that opportunities for the individual to access the computer are few and far between. When they are able to gain access the resulting activities are neither useful nor interesting.

For the most part, students do not appear to enjoy being in the classroom. They have little interest in the learning process and, indeed, in some cases find learning itself “boring”. Even so, our students are still attending school day in and day out. What brings them into school and how do they spend their time when they are here?

12.2. What do pupils do for most of the time in school?

Patently all students are achieving some level of education from the curriculum. How are they managing to achieve this if lessons, ICT and teaching methods are “useless”? Do we know what students do for most of their time in school? As in prior interviews, students chose to refer to classroom activities in passing, preferring for the most part to concentrate on social interactions with their peers.

The typical student would certainly appear to get plenty of social activities, even if the intellectual demands of his studies leave a lot to be desired.

“Usually in the first session we just meet up with everybody and talk with each other to see what...on Monday what's happened on the weekend and just see what each of us did and reunite with everybody. We just talk with each other and that's what happens in school. We do get told off like warnings but we still continue messing about. That's what really happens”.
(Boy year 10)

This student also chose to avail himself of the out-of-school activities on offer. This appears to be a good place to meet up with friends “and re-unite with everybody”. The first lesson of the week appears to serve as a useful “overflow” for any updates not accommodated in the pre-school ICT club. Teachers’ reprimands appear to count for little consideration during this period which appears to have become an establishment agenda. “That’s what really happens.”

One student appears to have a lot of excess energy to expend—mostly it would appear on “playing jokes”. The phrase “...if it’s a lesson I like I calm down quickly” is a telling one.

“Just messing about with my friends.... Sometimes I really like to go to lessons it depends which lesson. But if its just like ICT I don't listen to teacher...”
(Boy year 10)

One is tempted to compare this analogy with the girl in the previous question who admitted that she felt “stressed all the time”. Are these two different sides, perhaps, of the same coin? As has always been the case, the students are not above inventing the occasional excuse for when the monotony of the classroom gets too much. The excuses are just as transparent and unimaginative as ever.

Some students stand out. There is real aggression and resentment contained within these statements.

“Mess about with my friends. I don't listen to teachers what they say because they don't listen to what we say... In school you don't really learn what you wanna learn...”
(Boy year 10)

This student appears proud of the disruption he causes and the comparative lack of retribution that follows. “It’s only a detention, you can get it done, and it’s easy”. He is aware of his actions and the impression they make on staff and students alike, but he truly has little regard for them. “I can’t wait for break or dinner time, just to get out of lessons”. The subjects that do hold interest for him he “never (gets) to”. “Teachers are always like shouting at you and say ‘bad kids’ and you *just never get taught*”. Obviously there is a complete breakdown in communication here, with both sides feeling resentful and unfairly treated. The recurring monotony of the school day is in all probability as demanding for staff and students alike. In the context of such resentment ICT can not offer a panacea.

Other students have the same experience to relate. Talking and interaction with friends continues to take centre stage for most of them. However teachers’ attitudes still give rise to resentment amongst them.

“Talk with my friends, mess about with them in the corridor. I just argue with the teachers because they just argue... I don't like it when I' m split up from friends”. *(Girl year 9)*

The above student clearly feels that daily interchange with teachers consists of alternating bouts of argument and total disregard. Respect should be a “two way street”, something which does not appear to be given in this student’s perception. “If they asked you in a polite way students might listen”.

There appears to be a lot of “messaging around” both in and out of the classroom.

“There is nothing to do. It is just boring”. *(Girl year 9)*

Obviously there should be plenty to do, even if not much to her liking. The following statement shows that this appears to be particularly relevant to ICT classes.

“Um... I learn and spend most of my time in school by just like messing around with my friends and playing with them... I don't like ICT lesson... In ICT the work we are doing is just too much and its boring...”
(Girl year 9)

It is unclear from this student's response whether this is due to a new teacher or a different teaching style from previous staff or whether the fault lies in the demands of the curriculum. Presumably ICT was a boring subject to start with if it is considered “more boring” now and it is just another lesson embedded in school culture.

Friends, lesson content and the attitude of teaching staff all play a role in inspiring attendance.

“Just dossing about with my friends and just chilling really...”

(Girl year 9)

For the majority of students, socialising is indeed the prime factor not only in enjoying school but also in attending. Students frequently mention that they fail to understand why teaching staff frown on talking in class. There is an underlying suggestion here that students do not feel they are given adequate avenues of self-expression at school. Their input is not encouraged or even listened to.

“It's not right that you just shut up all the time. You should be allowed to talk to your mates...”
(Girl year 9)

One student makes an interesting and perceptive suggestion that lessons could be more varied in their learning styles and delivery.

“Most of the time in school, mess about with my friends, go to lessons. Some lessons are a bit boring and I’m just getting fed up with them...”
(Girl year 9)

For the most part, students admit that the main advantages of school as a learning environment are social interaction and personal friendships. For some students, sport and the camaraderie it offers is a pleasant and invigorating activity in bleak contrast to the boredom of the classroom. This may be due in part to the opportunities for spontaneity and creative expression that is on offer as much as the chance to catch up with friends and “chat”.

Some students frankly admit that they do not understand the subject (ICT) and therefore take minimal interest in classroom activities. For them football and talking with friends become the major highlights of the academic day.

“Most of the time I mess about with my friends but I go to lessons and do my work...I walk around with my friends and mess about...”
(Girl year 9)

“I play football and mess around in the grounds. Spend most of my time with my friends but split up in some lessons... Schools are a good way of making friends and meeting more people. My friends are good friends. I get on with them and play football with them”.
(Boy year 9)

Overall there is a general concern amongst students that a certain amount of talking or chattering is essential if one is to survive the tedium of the classroom. Students resent being “split up” from their friends. Friends are important to them and school offers the potential to acquire more friends. For many students the lack of social networks outside school poses a very real anxiety. It is hardly surprising, therefore, that teachers face a difficult and frustrating challenge when trying to engage their charges’ interest in the

repetitive and time consuming atmosphere of the classroom. The researcher's intention is to explore pupils' experiences of using ICT in the context of school in general. That is the only way to explain their negative attitude to ICT.

Students were asked to comment on their experience and perceptions of school. This was to prove an interesting exercise as, for the first time in this survey, students commented in greater detail on matters which had previously been only mentioned in passing. As usual, ICT does not appear to play a significant part in their vision.

“... I enjoy school more than at home because in school you make new friends and there are usually more friends in school to play with. At home if you live on a main road you can't really play anywhere. But in school there is a big field we can always play football. So I like school better than at home...”

(Boy year 10)

The social activities obviously outweigh any opportunities for learning that may be gleaned in school. This boy is openly dismissive of the facilities his school can offer, other than the “big field” on which he can play football. “If you come just for education only, it would be better off at home than in school”. The implication is that he learns little at school that he cannot learn as effectively at home. This may be construed as a comment on the school's limited resources, the prevailing culture of “messaging about” which so many students have previously commented on.

Other students have far more to fear than boredom. This boy has a resigned attitude which denotes substantial experience of the events he describes.

“...My experience is not so good. School is a horrible place. Lessons are boring like you think that you are just going to horrible lesson and you just bring your eyes down and just start soaking the lesson and stuff like that...”

(Boy year 10)

It would appear that there is little opportunity to fight back. Of the teaching staff he remarks. "They can do what they want. They can give you detention if they want". The only defence he can offer is "...you just bring your eyes down and just start soaking the lesson..."

Another student adds

"But when you see people being bullied and stuff, you just don't like it". *(Boy year 9)*

It would appear that bullying is not an uncommon experience for some most of the students and an experience which is bound to affect how they see school and the social structure that surrounds it.

"...It can be bad when the teachers are like, really tight..." *(Boy year 10)*

There can be thin dividing line between discipline and intimidation, especially for the more vulnerable or susceptible student.

"...So I think my experience is bad in the school" *(Boy year 9)*

Another student echoes the sentiments of our first interviewee.

"... We don't learn. I think its just a waste of time..." *(Boy year 9)*

There are very definite statements and reflect an extremely negative view of the school experience. One boy comments,

"...My experience in school is bit boring really but you have got to go really because its your future ahead of you..." *(Boy year 9)*

If one's experience of school is a negative one, then it follows that school lesson and delivery styles will also assume a negative profile in the student's experience. How can our students derive the promised enjoyment and enhancement of ICT into their schooling when it is perceived as merely another negative experience to be endured in a whole series of negative experience?

For this student, at least, the trials and tribulations of the academic day are a necessary evil if one wishes to achieve one's long term aims. For this boy there is no suggestion of being "made to go" by his parents. This is a survival strategy he has worked out for himself.

Another boy comments,

"...Sometimes you have to do some boring things. Its not all fun or games. Like when you are in your exams or you have to write essays things like that..." *(Boy year 9)*

The "boring things" of which he speaks are exams and essays. Again secondary education is compared unfavourably to infant school which was "easy", and "we didn't do as much and didn't get told off or anything" Clearly it is also more pleasurable to work from home. ICT lessons in school are of little practical use to pupils..

"...But teachers make ICT lessons boring...It is a lot more fun at home than working in school and listening to teachers. Its more boring and tiring in school than at home. *(Girl year 9)*

The following interviewee makes a subtle distinction.

"...I like school but not the teachers...." *(Girl year 9)*

She has chosen to interpret the question quite literally and remove the teaching staff altogether from the question. For her, a school without teachers would be the ideal environment where she could socialize with her friends and use the social skills acquired at school (i.e. how to deal with differences of opinion) without the rigours of the classroom. She further states bluntly that,

“... It’s really bad. It’s bad because I don’t think teachers got right attitude. They got bad attitude...” *(Girl year 9)*

This bears out previous interviewees’ perceptions of the school being an intimidating place. Other people, especially those in power use status and physical size to intimidate even if they draw the line at physical abuse such as pushing or shoving. Small wonder that some students feel they have no one they can turn to for support. For the most part however, students see school as a delicate balancing act to combine the two worlds of “them” and “us”.

If attendance and grades are acceptable there is no reason why school should not be a comparatively pleasant experience.

“Well my experience is good because my attendance and my grades and other things are really good.... When you see like if you say in class some people like dubbing each other, make fun of each other or being racist...” *(Girl year 9)*

Students’ experiences are different when they have the opportunity to bond together with a group of friends.

“My overall experience in school is quite exciting really because every day you are doing something different with your friends” *(Girl year 9)*

“...I think its a good place to socialise as well. It's a big place,
a lot of walking around to do as well”. *(Boy year 9)*

This is a poignant comment on her experience of school. One young student openly states,

“... This school is letting itself down and suffering...I feel that
there is a lot of racism” *(Girl year 9)*

Not only is this girl appalled by what is happening around her but she clearly feels ashamed because of her passive participation in letting it happen.

There might be no way that a young girl could influence or have any impact upon the racist behaviour of others on her own, but it is sad to think that the people around her are not taking action on her behalf. A tacit admission that “racism is a fact of life” is no excuse for not seizing every opportunity to confront it head on. In another school, the experience is very different and far more positive.

“...There are different races and nationalities who come to
(our) school... I just like to come to school. Erm... it's good to
socialize, to see your friends and to just have a laugh”.
(Boy year 9)

It is apparent from these interviews that one's enjoyment of school is dependent on attitudes, friendships and teaching styles. In some cases it hinges upon the actual school itself and the people who comprise it. Clearly students are aware that there are “good” and “bad” schools but their definitions of good and bad are based upon academic prowess. In some unfortunate causes it boils down to one very pertinent and unsavoury factor .

“Is school a safe place to be”?

12.3. How much time do pupils actually spend working in school?

The evidence that the most valued aspect of school for many pupils was its social, rather than academic agenda. Students enjoy having a forum in which to meet their friends and renew social bonds. A significant number of students find it acceptable to continuously “mess around” in lessons, paying little heed to any remonstrations and certainly not absorbing the knowledge that is being offered to them.

Many of them admit openly that they find ICT applications boring and do not enjoy being expected to work in their lessons. For a vocal few, the classroom is the ideal setting in which to relax, “chill out” and “talk with mates”. Small wonder then these same students have difficulty in understanding ICT, let alone applying it to their studies.

A significant number of students openly stated that they would rather play football or indulge in other forms of social networking rather than communicate electronically. This catalogue of extra curricula activity prompted the researcher to ask how much time they (the students) spend in working in school.

The vagueness of the students’ replies when asked about what they did in school was pursued in more depth. This time students were asked to be specific about the time they spent working in school and how they spent that time. The answers were revealing.

“Um... school starts at 8.55 in the morning and it ends at 3.15 and you get like little breaks and in between the school time like break time and you got dinnertime. Obviously they vary for each year. And after dinner we have tutor time and last about um...about 15 minutes something like that...”

(Boy year 10)

There is obviously some leeway allowed for travelling to and from lessons between classes and this can be anything from 5-10 minutes depending on the location of the next classroom. When we add in the time taken “to get books out”, “packing equipment” and “tutor time” we can see that this makes insignificant inroads into the working day.

ICT lesson is not mentioned, for all the students details concerning time there is actually very little substance contained within that time. For example we do not know how much time is generally spent on “tidying up” although we do know that the teacher “likes a tidy class ” and that it is important to leave the classroom in a manageable state for the next lesson. We know from the other students that the lessons are 55 minutes long. However with all the “messaging about” and “tidying up” how much of his 55 minutes is actually spent on learning activities? Other students are slightly more forthcoming regarding this point. One such estimate is telling,

“In each lesson we probably work about half an hour and for rest of the time we just listen to teacher and talk to our friends...”
(Boy year 9)

No mention here of “tidying up” or “packing it (equipment) away” including ICT.

Another boy is even more critical.

“Not 5 hours anyway. Because sometimes you don't even learn in school...”
(Boy year 9)

Yet another student comments,

“...Um... roughly we spend about just more than 6 hours in school, but I think only we only spend about 4.30 hours in lessons and even that's not the time we spend working...”
(Boy year 9)

Although vague as to the actual amount in learning, students are almost brutally realistic and consistently negative concerning the amount of time that is lost. They have a strong awareness that a substantial part of the school day is being absorbed in house keeping and time wasting in about equal measure, time when they could be using computers. There is the presumption of a structured, organized timetable yet facilities and resources are still not being accessed to their optimum levels.

The following student goes to great lengths to avoid sticking to the point!

“Em... about 4-5 hours. In the school we go in lessons, work talk and just play around and we got break times in between... Some times I skive from my ICT lessons like people say I am going to toilet and then go outside and mess about...”

(Boy year 9)

We have a grudging admission of 4-5 hours and then the subject is rapidly changed to the more interesting topics of football and break times. Despite the brevity of his response this student still finds time to give us some interesting tips on “skiving”, even though he has experienced the consequences of his actions in the past.

As he states above “If you get caught though you get in really big trouble. This happened to me once and it was horrible.” It is clear that despite the risks this student still finds it profitable to avoid lessons if an opportunity presents itself. Not only does he appear to take little interest in the learning process itself, he also prefers to avoid even talking about lessons if at all possible. After his initial estimate of working hours in the school day he employs every instrument of distraction at his disposal to divert the researcher’s attention elsewhere. Football and the social interaction it affords is obviously a much more attractive topic of conversation than lessons. Throughout the survey as a whole the

opportunity for students to meet each other, either for sporting activities or just to mingle together in large groups would appear to be a particularly appealing one. Students are forced to be there. Their attitudes to ICT are formed by the fact that they have no choice.

Although students repeatedly go back to individual friendships and the necessity to cement these friendships at every given opportunity, either by “chat” or “messaging about” there is clearly a strong attraction for them in devising opportunities which allow contact within a large social group.

As one student comments,

“We don't work all the time. We do talk to each other. Your friends support you a lot and if I didn't have any friends I wouldn't enjoy it”.
(Boy year 9)

School plays a considerable role within the life of all students. This role appears to be more founded on social contexts rather than academic achievement and the acquisition of knowledge. The significant amount of time spent in furthering social prowess as apposed to activities within the learning environment of the classroom would appear to imply that the “higher function” of school (i.e. learning) takes a back seat.

Students are aware of the expectations placed upon them to learn and apply themselves to their studies. However, the reality of their situation appears to be taken up with talking to friends, “messaging about” and arranging the structure of their lessons so that learning time is reduced and social opportunities promoted. This of course is not the generally accepted view of academia that is expected. The students must present valid justifications of their

actions if they are to appear both diligent and reasonable. These justifications may appear slight.

“...We have to have a seating plan, stick to that all the time. So I find ICT boring, not interesting...” (Boy year 9)

To the pupils these rules and contexts assume consummate importance. There is a genuine reluctance to perceive learning as a goal. The choosing of the more pleasant option over a less favourable alternative is to choose to avoid the demands of lessons. One fact is demonstrated continuously through these interviews. Bored children are not stimulated to learn. If the subject matter is delivered in what is perceived as an unattractive manner or in a pedantic, inflexible structure which affords little room for imagination or autonomy. Then it is predictable that the child will rebel in the only manner available? If we really wish to encourage our children not only to learn but also to want to learn then surely a more open approach to the teaching process, one that encourages participation and acknowledges original thought, should be encouraged?

This student certainly appears to spend a disproportionate amount of his time “messaging about”

“Em...school starts at 8.45 and finishes at 3.10. In some lessons I work and in some lessons I don't work I just mess about... In other words ICT lessons are dull! We don't work all the time in school. If we do it gets boring. We lose interest in lessons”.

(Boy year 9)

He clearly has little regard for the academic system and will seize every opportunity to circumvent it. This is not merely a child “showing off”. His voice and manner note a very real contempt and may mask a deep-rooted resentment of the restraints that school places upon him. He has already made strong decisions and acquired firm beliefs about what is

important to the structure of his school day and what is not. Some lessons (i.e. Spanish & French) are dismissed as “not really important” with the resulting outcome that “...I don’t try as hard...” This is not simply a reluctant student seeking to avoid the discipline of an academic. This same student tells us “.... I try to do my best in the most important ones (subjects)... which I am good at”. Unfortunately ICT does not appear to be one of them. Despite being “told off many times by the teacher” he regards certain lessons and tutorials as fair game for “messaging about” and “skiving”.

By his own admission, in a school day that commences at 8.45 and finishes at 3.10 a sizeable proportion of work is not being done. “We don’t work all the time in school. If we do it gets boring...” It is interesting that this student’s perceptions regarding the length of his academic day are at variance with his fellows. Clearly the students’ perceptions of when the academic day begins and ends are based more on their own agenda which incorporate the time necessary for social exchanges and less upon the tutorial staff who are working hard to incorporate a cohesive learning structure in to the limited time available to them.

Are the pupils’ problems with the staff, their delivery styles or the lessons themselves?

The distinction is not important to the pupils.

“...We do our normal lessons but I don’t know how many hours. Em...eh...5 hours about... Talking half way through”, “chewing”, “talking to friends”...

All have a vital role to play in diverting interest away from the lesson in hand. He further states that

“I always do some work but I might do more work in one lesson (than other)...it’s weird, its different”. (*Girl year 10*)

There would appear to be a firm belief that the school day is just too long to hold the average student's attention for any significant time. Many students refer to the repetition and inflexible learning style that many lessons impose on their charges. One student remarks succinctly.

“It depends what lesson it is. If I like the lesson I will do some work in there and if I don't like the lesson I just do something else”.
(Girl year 10)

There is little opportunity for independent thought here (i.e. taking a lap top to work with if a computer is unavailable).

The following student is more definite in her assessment of the working day.

“I don't erm... erm...we have 5 lessons each day and we like an hour of each lesson. And we spend probably 30 minutes working and the other half just doing registration, and finding out what the work is going to be about....”
(Girl year 9)

From her we understand that there are five lessons a day comprising one hour each. From this one hour approximately 30 minutes is spent on actual class work and registration and the ubiquitous “messaging about” consume the rest. In other words, they submit to learning rather than enjoy it. ICT and its messages of a bright future have had little impact here. The amount of work generated in the classroom is clearly dependent on many different factors i.e. the content and subject of the lesson itself, how it is presented to the students and the individual personality and teaching styles of the tutor who is delivering the lesson. When one throws into the equation such elements as the student's individual learning style and low boredom threshold it is clear why some students find it so difficult to attain their full potential. As noted in previous interviews there appear to be a significant number of students who are astute enough to realize the benefits of a “good”

education and have learnt to combine their social activities with enhanced performance as the exams are looming, thereby getting the best from both worlds. For the majority school appears to be a necessary obligation which, whilst affording greater social contact with others at the same time seeks to control that interaction and limit it to an unacceptable level. In short, the system is now representing a “challenge” which must be, if not directly confronted, at least circumvented at every opportunity in order to ensure a reasonable level of social interchange.

The following student offers us some hard facts regarding the times of lessons but then progresses to a series of subjective statements regarding the lessons and staff who deliver them. One such typical statement is telling

“...I don't like IT because I don't know what we are doing and I don't like none of the teachers and its boring...”

(Girl year 9)

All of the comments are interrelated. It is very difficult to enjoy a subject if one does not understand its basic principles. Similarly one can be expected to dislike or resent the staff who are imparting this knowledge if, in fact, that knowledge is not being communicated to the student. The conclusion of this particular student is that ICT is “boring”. Again the suggestion of conflict between teacher and student is raised by the same student “...You cannot win them. Just have to be bad in some lessons... I just annoy teachers and other people and get told off”.

All of the students interviewed have preferred to concentrate on social exchanges and friendships, even when directly asked to comment upon purely factual or academic issues. It is clear that social issues are the main thrust of their interest and the studies

themselves feature only briefly in their priorities and then only in a minor role. One student comments,

“...In theory we work for about 4 hours and 45 minutes per day, ...We actually waste some in changing lessons...”
(Girl year 9)

Another student presents an interesting variation on this theme,

“...Half of the time is missed by not listening to what the teacher is saying...half of the time if I am telling the truth I am messing about with my friends...”
(Girl year 9)

It is clear from this remark that “work” appears to be something that the teacher does to you or does with you, rather than something you achieve on your own merit.

Clearly “writing something down” is indeed “work”. This student regards her English essays as work, presumably because they are written during the school day. On further examination this particular student’s day appears to be crammed with “work”, (i.e. “going on the computers”, discussions and “writing things down”). However she appears to discount all of these activities as work because she also talks “all the time” to her friend in the class. On the surface students appear to be co-operating but, although their views are refreshingly honest and forthright, these interviews may represent just one more opportunity for “messing about”. This is not to say that the interviews are without value. Students certainly appear to be considerably more open and co-operative with the researcher than one suspects they may be with their teacher(s) in class.

However, we are left with the distinct impression that one of the major factors in influencing these students to participate in may be the opportunity to add variety and interest to what appears to them to be on otherwise boring academic day.

12.4. How do pupils spend time in school?

As has been noted previously, the apparent anomalies in student responses have obliged the researcher to incorporate certain “check” questions in much the same way that a psychometric analysis will include comparison questions in order to validate data. From the researcher’s earlier forays into the activities that form an average academic day we have received conflicting data from the students interviewed. So far the qualitative and quantitative data have both confirmed that students do not work throughout an entire lesson period. The average length of active learning for a lesson is about 25-30 minutes and the rest of that period comprises the ubiquitous “messaging about” or talking with friends.

Indeed, the main purpose of school appears to be the opportunities for social interaction it offers. The vast majority of students enjoy the social context of school rather the academic environment. The acquisition of learning becomes a poor second or third place compared to the delights of social bonding. Once again we have heard that ICT is “boring” and that students do not actively enjoy using it. Clearly ICT is not integrating itself in the educational system. It has not fulfilled the dreams that were hoped of it. Students are confused rather than dazzled by it, apathetic rather than engaged and would rather indulge in physical horseplay and /or organised Physical Education than the virtual realities of cyberspace. Once again we must ask ourselves just what are students doing during their school time if they are not enjoying learning, and are, indeed acquiring negative attitudes to ICT

Students were surprisingly vague about what they do in school.

“I talk to my friends that is what we do in the school...”

(Boy year 10)

This student admits to doing “some work” but qualifies this with the statement that he tends to “switch off” if he finds the lesson boring. This is a recurring theme in all the student interviews conducted over this period. Many students make a direct comparison between work which is “boring” and “messaging around with friends all the time” which is “interesting”. Some students qualify this perception by explaining that it is the repetitive nature of the work which lends it so little interest.

One student makes it clear that this is not a state of affairs that is unique to ICT classes.

“...I don't like doing same things over and over again and it is the same with every lesson...”
(Boy year 9)

There is a crucial point. Perhaps school itself and repetitive learning patterns are the real culprits here and not the ICT as such.

Another student finds the teaching style constrictive and points out that,

“I talk to my friends it makes the lesson more interesting...
And if you talk to your friends they can help you as well”.
(Boy year 9)

What is emerging from these interviews is that lessons in general, and ICT lessons in particular, are not holding the attention of their audience in the way that would surely be desirable to both students and staff. Even the threat of reprisals holds little consideration with students. Rather than change their behaviour patterns students are merely becoming more adept at concealing frowned upon activities.

“...They give warnings and if I carry on I get detentions and all that but we still do it though. And most of the time I don't get caught”.
(Boy year 10)

It would appear that partly because of the repetitive and lacklustre learning methods employed, students and staff are unwittingly collaborating in a vicious cycle of non-communication and lack of interest that is virtually guaranteed to produce negative reactions both sides of the desk.

Some students are more pragmatic. They understand that groups are dependent on co-operation and communication between group members and this offers the opportunity to converse at a social level as well as an academic one. However, this is still dependent on the expectations of an individual member of staff.

“...If the teacher is nice he will let us choose our own groups... I prefer it this way. However if the teacher isn't nice and he puts us into groups...”
(Boy year 9)

All the students interviewed put a high premium on personal friendships and social groups. Students appear to congregate together immediately upon arriving at school and do their utmost to remain in those same social groupings throughout the academic day. Indeed, one of the drawbacks of group work is that as the same student states that,

“...We might not like the people that we have to work with...”
(Boy year 9)

As gathered from the earlier interviews, many of these friendships are unable to flourish outside their natural environment (i.e. school) due to many different social and practical factors. Communication by text or e-mail can be interesting but does not replace the personal exchanges that these social groups can offer. There is little surprise then that the possibility of reprisals holds no real deterrent.

“...This can get us into trouble or detention... half an hour or an hour after school! But I don't listen to them I like talking with my friends”.
(Boy year 9)

The very most a detention offers is yet a further opportunity to spend time with friends that it may otherwise be difficult to achieve outside school hours. There is little mention of lessons except as an opportunity to indulge in talking. Students found it difficult even to consider classroom matters, choosing instead to steer the conversation back to the subject of their friends. Indeed, the researcher detected a singular desire to seize the opportunity for an interview and gain some respite from the classroom. The researcher does not deceive herself that her questions held any real attraction for those students participating. However, the opportunity for them to feel listened to rather than spoken at would appear to be an opportunity not to be passed. When students show an interest in ICT there is still a very real frustration regarding the standard of school equipment which, for the most part contrasts unfavourably with that at home.

In common with many of the students interviewed the following boy responds to the question by evading the subject of lessons or school work altogether.

“I spend most of my time walking around with my friends and learning. ... Sometimes I come to the ICT room but don't like to work because its boring.... Bu the Internet is quite slow...”
(Boy year 9)

“Time” is here constructed as being time perceived to have value. Therefore the things of value are the things discussed i.e. football, food, and basketball, even the lowly ice cream van, appear to occupy a greater significance in this student's view of the academic world than the actual process of learning. When the researcher ventures into the forbidden territory of the classroom and its learning pursuits this is met with a calculated evasiveness, which, because it is not malicious is all the more telling. Students clearly

feel uncomfortable discussing the learning process although, supposedly, that self same process is the reason for their presence in school and for the interest in hearing their views in the first place. It seems incredible that these students place so little emphasis on their academic studies. Indeed they are telling truth as they perceive it but constantly reviewing and amending their accounts so as to disregard the less pleasant and more pedantic activities of the academic day.

All of the students interviewed agree that “having a laugh” in the class is not only acceptable but also desirable. To a certain extent this is healthy as warmth, humour and freedom of expression all make a valuable contribution to both the learning process and personal development as an individual. The overall malaise of boredom and indifference within the classroom is particularly noticeable. When asked to venture a description of the working days very little “work” features in any of the student responses. Students volunteering not only details of his academic day but can also portraying some aspects of it in a positive and meaningful manner. Even when discussing social activities clearly have an understanding of the “bigger picture”, but the overall conclusion are bleak. They are realistic but associate ICT with a general sense of malaise. What is clear that they wish for different patterns of learning.

“...My friends in school are very helpful. They help you with work if you struck and if like you got any problem or they got any...”
(Boy year 9)

Although this student has little difficulty in naming her least favoured lessons we still come back to that by now hackneyed description of what is “boring”. This student is vague as to times and timetable demands.

“I go to my first lesson, normally I am late...my friends are with me in most of the lessons. I don't like it with out them...I go out with my friends because I don't like school dinners then I come back... I have been told off many times. These classrooms are freezing. If in any lesson I am not with my friends...I talk to my friends and have more fun...”

(Girl year 9)

Another girl mentions that

“...I have my timetable with my friends...”

(Girl year 9)

The timetable to which she refers is for purpose does it of her own. Students are for the most part forthcoming in their descriptions of daily academic life but these are personal, not official account. They have their own agendas. School timetable, fulfilling demands and submitting homework appear to play no part in their daily activities.

Sometimes the conflict of priorities can materialize into more substantive exchanges between students and staff. Again, the following student is always late for school.

“Talking with my friends... I meet my friends there. Most of the time I argue with my teachers because I don't get along with my teachers... Its boring, all school boring. Every kid thinks like that. I don't know”

(Girl year 9)

Most of the time she argues with her teachers because she doe not get along with her teachers. She is clearly unhappy at school and has little time for any thing other than the Art and Drama departments which are “really interesting”. These are two subjects which call for freedom of expression and creative thought from students. Students have considerably more autonomy within the artistic subjects where abstract thought is positively encouraged and where they are no given absolutes for students to compare themselves with. It is easy to see how a student who feels stilted and confined within the more traditional classroom would experience feelings of liberation within a subject like

Drama that allows not only freedom of thought but also disregards the purely physical confines of movement and vocal expression for the purpose of learning one's craft.

“...Teachers don't have patience for you...It's boring, all school boring. Every kid thinks like that”. This is a voice of rebel-unhappy, opinionated and questioning. However if society is to evolve and change to accommodate the citizens of the future then society would do well to pay heed to the voice of the rebel...”
(Girl year 9)

All the students interviewed diligently attended their lessons. None admitted to “boring off” on a regular basis or otherwise finding excuses not to attend. However their behaviour in the classroom demonstrates their lack of interest and sometimes bewilderment. The flesh is present but the spirit may very well be somewhere else, reliving events of the weekend or planning the weekend to come. Clearly some students “act up” out of sheer boredom but others have chosen to withdraw their interest because they find subjects difficult and/or the teacher is not communicating knowledge in a way that is open to them.

It is possible to achieve a healthy balance between social interaction and hard work as this student demonstrates.

“I spend my time in school by hanging out with my friends, going to shop to buy stuff and I do like to come to school because there is a serious side of the school...”
(Girl year 9)

Although she admits to “messing around” in lessons she is firm in her opinion that “there is a serious side of the school”. Clearly there are rules to be recognized and adhered to. For the more astute student one can appear to be following these rules and still manage to manipulate the classroom environment to one's own advantage.

Another student comments that,

“...If I finish it quite quickly so teacher just set me more work so I like just waste some time with my friends in the lessons...”

(Girl year 9)

It is prudent therefore to work more slowly if one is to build in some quality time with friends. Most students interviewed declined to define “boring”. A few admitted to difficulties with understanding the subject finding it easier to “drag on a bit” than participate and run the risk of appearing foolish. For the most part it would appear that for the majority of the students a combination of inherited behaviour patterns from senior students and peer pressure have coalesced to define an accepted behavioural “norm” which requires constant “messaging around” to cement the strong social structure of friendship firmly in place.

Those students who manage to achieve an acceptable balance are able to function well academically, even with the constant distractions around them. They have learned to focus essentials and “buckle down” for the examinations. Others may experience difficulty in achieving this balance within the more traditional subjects where they are required to provide a “right answer” based on “correct” information. Where students are encouraged to work in groups, either in “workshops” or team events such sports and drama, their natural curiosity and learning styles are stimulated in a way that is both enjoyable and useful. It is a pity that such stimulation does not appear to occur within the narrow confines of the classroom.

12.4. Conclusion

From these interviews the researcher was able to glean further insight into students' attitudes towards school. The main results of this chapter (i.e. what do students do in their ICT lessons and in school on the whole) still remain depressing. To be sure we have the usual "messing about" and complaints about teaching staff but we are still not offered any solid evidence of actual activities being undertaken that are related to the academic day. It is becoming clear that students are less interested in the potential benefits that may be drawn from the groves of academe and more focused on the potential that school can offer as a social club.

Overwhelmingly the students' responses indicate disaffection with their studies, boredom and frustration. A few students volunteer their reasons for this state of affairs (i.e. individual teaching styles, teachers personalities, inconsistency of approach and even freezing classrooms) and in fairness these perceptions are not without some degree of validity. Some students are persistently late, or regularly vanish at break times and we are none the wiser as to where they go. One is left with an overwhelming impression of purposelessness, not with the intent of calculated evasion or intention to mislead the researcher but rather of an ingrained response to a series of thoughts or situations which are unpleasant to the informant. Not only are most of the students bored and resentful in the classroom but the very thought of lessons is enough to unsettle them. It is little wonder then that the integration of ICT learning tools has little appeal for them. Access problems aside, the academic environment itself is perceived as so soulless and non-productive that it would take considerably more than the arrival of the superhighway to make a significant impact upon their collective consciousness. For all the much vaunted importance of ICT, its impact upon our students, seems to be marginal in academic terms.

The schools offer the same curriculum and delivering as if ICT were marginal rather than central. In such a context it can make little fundamental change.

CHAPTER 13

PUPILS' PERCEPTION OF ICT AND ITS PURPOSE IN THE CONTEXT OF SCHOOL

Chapter 13

Pupils' perception of ICT and its purpose in the context of school

13.1. Introduction

What purpose does school serve and what do these purposes represent to the student body? By probing into this issue the researcher intends to establish pupils' perceptions of ICT in school and the focus and function of ICT in schools when placed within the context of learning of ICT. Students were invited to tell what they thought school was for.

What purposes does it serve and does it achieve these objectives?

Overall the responses were extremely negative. Phrases such as "its' boring", "waste of time" and "they don't listen to us" were repeated over and over again. On an intellectual level students appreciate that school is an instrument of learning. However their main concerns appear to be vested in the social aspects of school and the perceived divide between students and tutorial staff.

"Um...friends, get along with people, make new friends. Um...to get an education, get good grades in GCSE. Um...schools are. For me that's every thing, why you come to school. Em...you can socialise with people. You can learn things at the same time as well. And it makes, like, your life really. You come to school, make friends, get an education and education gets you to jobs and I think that is all you want from life, like friends and education". *(Boy year 10)*

Students appreciate that school is there to provide education and it is necessary to be educated in order to find employment in later life. However the first thoughts are of friends and the opportunities at school to extend the social circle, not the use of ICT in school. They perceive school as a useful environment to acquire those social skills which

will serve them well when they exchange an academic environment for the world of work, “(to learn to get along with people...). Students are critical.

It is evident that most of the students interviewed do not feel stimulated by their academic studies and resent the repetitive nature of their classes. School is also perceived as the only viable alternative to being at home. One of the recurrent themes to emerge from these interviews as a whole concerns the opportunities that school offers to meet and makes friends with other people with whom students would otherwise have little or no contact. As one boy says

“You learn about other people’s religions as well and you get to know lots of different people”
(Boy year 10).

Students’ friends and classmates serve as a welcome relief from the tedium of the learning process. These students are refreshingly blunt in their responses. When asked, “what is school for”? One replied immediately “I don’t know really.” The overall message is clearly defined-friends are important and studying less so.

“I don’t know really. I come to school because I meet my friends...”
(Boy year 9)

“It will occasionally get interesting, then you go back to routine...”
(Boy year 9)

Other students have far more to fear than boredom. This boy has a resigned attitude which denotes substantial experience of the events he describes.

“...My experience is not so good. School is a horrible place. Lessons are boring... I think my experience is bad in school”.
(Boy year 10)

Mixed feelings and emotions play a strong role here. The importance of literacy skills and their potential to enhance social and communication skills as a whole is clearly grasped. However there is still an element of resentment in this knowledge.

“It's there for learning in theory because you can read and write... I like it because you get to learn, you get to make new friends, and of course have fun”!
(Boy year 9)

For some of these students there is an awareness of some element of social isolation outside school. Without the social contact offered in school it would be difficult to access such vast opportunities for social intercourse at home. Many students communicate with each other by e-mail outside school hours. The possibilities of physical recreation are perhaps not available to them. Also, if one has a disagreement, as is common within adolescence, the opportunity is there to replace them with another.

“It's a safe and big environment for children... to interact with many people”.
(Boy year 9)

In school students can easily access accurate checkable information about their fellow students before deciding to become friends. Other students support this view, even if their experience of learning does not necessarily bear this out.

“School is for learning. It's not supposed to be for messing around with your friends. But that's what everybody does”.
(Boy year 9)

Friendship underpins every aspect of the learning process, not only by having companions to “mess about” with but also for the support they can offer, not only now but also in the years ahead.

“...As you grow older you need friends to help... if you're having a hard time”. You need your friends to socialise with them and tell them about your problems I think”. *(Boy year 9)*

Of course there can be an ideal balance between studies and social activities.

“In school you can meet friends and learn as well”.

(Girl year 9)

Indeed, friendship can sometimes be the biggest motivating factor in attending school at all.

“...You don't really wanna go to school, and you don't want to learn...when you got friends you are happy in your lessons...”

(Girl year 9)

The friendships that develop from these initial contacts face to face play a far greater role in most students views of the world than the qualifications they may take with them when they leave.

“To learn, to make friends and just somewhere to go. It is like where you make friends. If you are at home you don't. You don't really see any one at home. In school you see lots of people and you make friends with them...”

(Girl year 9)

“...School is the place to know more people. In school you meet people you never met before. People from different cultural backgrounds come to school”.

(Girl year 9)

Talking, “messaging about” and chatting in school are viewed as a necessary contribution to the learning process, either by exchanging information or by consolidating social relationships. Fear of reprisals for such activities hold little interest for most students. It is boring for them because the repetitive nature of the work is not interesting for them.

“Make friends, you can learn new things. Um...you can learn from your friends... There is plenty of people you can make friends with and talk around, make fun of people, argue...”

(Girl year 9)

Little wonder that these students will happily take the risk of detention or a verbal reprimand in order to gain the social interaction they crave and which is so difficult to

access at home. E-mail and text messages can convey the meaning of the message but not the immediate impact of its sender. For this, one needs to talk face to face.

While pupils appreciate the need for a good education they still place a greater emphasis on social needs.

“Em...to get an education...If my friends weren't there em...I probably wouldn't like to go to school...I don't like teachers all the time because they are really horrible...” *(Girl year 9)*

This student admits that she “probably would go (to school) but not as often if they (her friends) weren't here” whilst admitting that school “might be a waste of time”. she acknowledges that she “will probably regret (it) if I didn't go to school”. Once again we encounter the usual complaints, “it's boring”, “lessons are too long”, “not enough holidays”.

“Learning and making friends, going to somewhere during the day. It's boring to be in school, like lessons are too long, not enough holidays and teachers are boring...” *(Girl year 9)*

However in the above statement this student brings a new and usual perspective as “school is too big and its always messy and it smells funny and there are arguments all the time”. Most of the students interviewed did not view their school as a threatening or unpleasant place in itself. There are the usual moans and groans but no indication of insecurity and unhappiness. This student has no reservations about putting her finger right on, the heart of the matter. “Its not like a happy place, is it”? ...“I am always stressed that's it”. Her tone of voice, worried and puzzled, invites us to agree with her.

“...It can be bad when the teachers are like, really tight...”

(Boy year 10)

One boy comments,

“...My experience in school is a bit boring really but you have got to go really because its your future ahead of you...”

(Boy year 9)

For this student, at least, the trials and tribulations of the academic day are a necessary evil if one wishes to achieve one's long term aims. For this boy there is no suggestion of being “made to go” by his parents. This is a survival strategy he has worked out for himself. Bullying, it appears, is a subject which does not go away easily, and even the girls are not immune as will be demonstrated in later interviews.

“...I am usually bullied quite a bit. Like other people pass me and punch me. Stuff like that....”

(Boy year 10)

This boy seems to take bullying in his stride. Far from feeling intimidated he shows a casual acceptance of bullying as a fact of life which is disconcerting in one so young. He has developed his own coping strategy. He further states that

“...But I see people making friends and chatting and stuff. There is more happy stuff. Like if you smile then you see lots of people talking and its' great”.

(Boy year 9)

From previous comparisons of the qualitative and quantitative data a picture is beginning to form of resentful students who neither enjoy school nor see any kind of meaningful benefits from attending school. If the whole experience of school is a negative one it seems hardly surprising that ICT is also regarded in a negative light. Is this a case of guilt

by association? What are the underlying reasons that persuade the students to attend school in the first place? They include the mundane.

“...In school your mum can't tell you what to do. You can just have fun, like mess about and do your work if you want to”...
(*Boy year 9*)

They include reluctant acceptance.

“My friends make me come to school. I don't wanna because its too early”...
(*Boy year 9*)

As earlier noted, the possibilities for new friendships are always there. The same boy states that

“...Like yesterday a new boy came to school and we played football so we made a new friend stuff like that”... Its really enjoyable because you to be with them (your friends).
(*Boy year10*)

When asked why she bothers to attend at all if doesn't enjoy the experience we get the ubiquitous refrain that “my mum makes me”. However, this is quickly followed by a qualifying statement by the same girl that her friends are there and that if she did not attend school she would not be able to see them.

“...You have to come to school. If you are not in school you can't talk to your friends”.
(*Girl year 9*)

This is underlined by a statement

“...School is rubbish. It's rubbish, you just don't do anything. You just write. They don't make it interesting like they used to be in Primary school”.
(*Girl year 9*)

What then is the difference in approach between secondary and primary teaching styles?

“Let us listen music and stuff like that. They don't let you do it. If you can't listen to music you don't like to work. They don't let you do anything. You just yup on”.
(Girl year 9)

It is clear that the less formal approach of primary school is contrasted with secondary school delivery styles, to the latter's detriment. Perhaps the reins of control are more evident in secondary education and this in itself inspires resentment and contempt just at a time when most adolescents are experiencing the urge to rebel and be different. It is certainly a strong urge to explore values and strategies which are different from those of preceding generations. The average adolescent does not take kindly to confinement, whether that be physical constraints of the classroom or the unlimited range of the imagination. Clearly, many students are able to learn, and learn well, as is evidenced by examination results year after year, however the preference for a tightly structured and (to a most part) predictable delivery system is bound by its very nature to alienate a sizeable proportion of our children.

One student bitterly remarks

“... (There is) nothing good in school.... School is not a nice word... Its horrible. Its just horrible when you have to wear a uniform. Its just seems a waste of time and money...”
(Girl year 9)

She attends school because

“...Government makes me and its somewhere to go because there is nothing really interesting on TV during the day... ”

It becomes clear then that school for many is a necessary balancing act between social activities and acquiring knowledge. Some students are more accomplished at this than others and have learned to take the best from each world. It would certainly not be “street

wise” to openly admit to coming school under anything other than duress, but it is clear that many students do enjoy themselves at school and can think of no valid alternative with which to replace it. For a few it represents an uninspiring and unattractive way of passing one’s day – How will these students cope with the impositions and structure that a working day will later place upon them in adult life? What life skills are we teaching to our children alongside the National Curriculum and how will society view their needs and address those needs in the future?

Students were then asked whether or not they liked coming to school. The responses were varied, if qualified, and reinforce the picture of daily academic life that we have by now come to know and expect.

“No. Because its rubbish, its not interesting... I’d rather stay at home, thanks”.
(Girl year 9)

“No. Because its rubbish, its not interesting”. “Sometimes I don't feel like coming to school its boring”. “They don't teach you things you want to learn”. “You can make new friends really”.

All of the students acknowledge that attending school is a given in their life, i.e. they have to go. They may not enjoy the physical act of attending school but they are aware of the potential consequences of non-compliance.

“...I have got games. Some days I don't really enjoy but I have got to go My parents will be mad if I didn't and I will get done for truancy (skiving). I can't do that because I will get told off and suspended”.
(Boy year 10)

This student diverts the conversation to a reflection on the ICT facilities available and is clearly frustrated by the limitations they impose upon him. He continues,

“...You can enjoy and learn as well if that Website is not blocked... We have access to the Internet. But there is like a block on some Websites....”

He is realistic about the reasons for those blocks (i.e. violent and pornographic imagery) and acknowledges that there is a need to protect students from doing “stupid stuff like that”. In this particular interview one is left with the distinct image of a child who finds the world of virtual reality far more interesting and appealing than anything his contemporaries have to offer. Although he is the only student not to qualify these activities with comparisons or references to social activities, other students look beyond the school gates and are already visualising a future beyond them.

“Because I want to go to college in a few years and to do that I have to go to school, get good grades and plus my parents make me come to school...Mainly I come to school to learn, that's probably the first point, and the second is probably to just chat and chill with my friends...”
(Boy year 10)

Friendships and the quality of these friendships which appear to influence the amount of enjoyment that students derive from school.

“That’s why I like school really, because you talk to your friends and make new friends as well”.
(Girl year 9)

13.2. Conclusion

From examining the qualitative and quantitative evidence it can be seen that school is certainly not the first choice of activity for the typical student, and that the sense of malaise, of submission and half hearted enjoyment pervades all subjects, including ICT .

From the above it can be determined that schools are not perceived as either enjoyable or useful. However where they do excel is in offering the opportunities to form mutual and rewarding friendships that will most likely survive the test of time.

The old adage that “school days are the happiest of your life” is patently not true for many students, but for others they offer the comfort and security of social contact that is simply not available elsewhere.

Today’s schools do not excite their students or inspire them towards dynamic personal and career goals. Negotiating social minefields and avoiding special attentions do not make the ideal conditions for students to derive real pleasure from any lesson, let alone ICT. If school itself is such a negative experience we should not be surprised that so few of the activities available in school appear to catch the interest and imagination of its charges.

What references here to ICT usages are infused with frustration over blocked websites and the limitations this places on the inquisitive student. It is tempting to consider that ICT usage may be seen as more enjoyable if these blocks were removed. It could that a greater freedom of access (under appropriate supervision) would certainly help to improve ICT’s image and attraction. Schools and their delivery of ICT are clearly not doing what was promised.

CHAPTER 14
CONCLUSION

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Conclusion

The crucial point is that the researcher is committed to the possibilities of ICT. There are all kind of ways in which ICT can be used as a transforming influence.

Evidence drawn from both quantitative and qualitative data demonstrates that there is a gap between people's expectations of ICT and what ICT in itself is delivering. Many understand the potential of computers. Some still believe that ICT will transform our education system and pupils will be able to develop their own learning styles. It is a fact that technology is impacting upon our lives in a significant way. What this research has discovered is that one cannot separate the experience that pupils have of ICT from the context in which it operates. Pupils' views of schools, and therefore of their experience of ICT as part of the curriculum are clear. The disappointment with ICT derives from the way it is delivered in the classroom, whether for its own sake or as a means of conveying information in a range of subjects. The pupils' attitudes are consistent and deeply embedded.

Harrison (1994) argued that for effective curriculum change a strategy needs to recognize the conditions within which teachers work and the structure of organization. Without applying such a strategy in the process of curriculum change the outcomes may be less satisfactory than is desired.

All discussions and arguments underline the message that ICT is now more available and more used in school. It is, however, not clear for what purpose, to what extent and what benefits pupils are generally getting from it. With schools using Information and Communication Technology there has been a certain impact on teaching and learning in classes. Pupils' attitudes, feelings and behaviour have been explored very little, whether playing games on the computers or using computers in school. The many innovative programmes do not have a widespread impact on schools. It could be because people are so intent on the programmes and the possibilities that they do not test the results. The research needs to concentrate on the ways in which people think as a result of using ICT and on the ways in which it is used in schools.

Educational technology has become increasingly varied over the years. It is utilised under different labels: educational development, staff development, applied educational science, instructional design and so on. This would imply the facility to combine different models which provide a blended learning experience appropriate to the individual's needs. People get the impression of distinct enthusiasm regarding Information and Communication Technology from students, schools, colleges and the general public, but there is still a lack of evidence of effectiveness for many uses of educational technology. The use of computers in education and training has been greatly influenced by the history of their introduction into industry and by their use in applications other than education and training. Teachers face many and varied problems relating both to their teaching and also to their students' learning. The problem is that the earliest enthusiasm for computers as learning tools coincided with the large main frame computers, print outs and what now seems cumbersome technology. With hindsight one wonders what it would have been like if the present capacities and uses were introduced afresh.

It is clear that the concerns of ICT centre on the acquisition and application of the principles and skills of problem solving in a context where the computer is a principal tool of solution. Problem-solving activities take up much time so pupils need more time for them in their lessons if they are to be successful. School pupils cannot be expected to judge their tasks accurately and to think logically about their work in the short time that is available to them in school. Technology itself is not the problem; the lack of effective co-ordination across the curriculum is. As a result, the integration of the new technology occurs inefficiently and is less effective in terms of compatibility and achievement. ICT places emphasis upon eliciting active student engagement as a means of encouraging students to construct and monitor their own learning processes and apply new skills to solving problems. The media is still constantly reporting that great changes will happen and, indeed, are happening in the exciting world of new technology. However, there is very little evidence to support these views when applied to schools. The pupils remain disengaged. Fundamentally, there has been limited change within the conditions of classrooms. It is impossible to separate the uses of computers from that context. As long as schools remain essentially the same, so will attitudes to computers.

Educators have a great emotional stake in the workplace (i.e. school). When significant change occurs in the workplace it can affect performance and disrupt perceptions of the organisations' culture and norms. To challenge a norm is to challenge a value.

If it is true that tutorial programmes or computers may be able replace teachers then why are teachers needed at all? Does each pupil still have a personal computer in the school or do pupils still share computers with each other? Do schools know how to adapt to the availability of the Internet, and all the opportunities of technology?

The intention was to find out how ICT is being used in the secondary school. It is discovered the actual uses of ICT cannot be isolated from the context in which it is operating. It does not work in a sealed unit from which the pupil learns and learns how to learn. It depends on how and where pupils use it. However, the researcher wanted to explore (first of all by observation) how ICT was being used in schools. There is much controversy about the levels at which ICT has an influence; whether it should be a subject in its own right or embedded in other subjects. The researcher found some interesting material about the ways in which ICT is used but there was little evidence of clear policy and practice. This is not to blame the teachers. What was discovered is the difficulties in pupils' perceptions. Their views of their experience of ICT in schools and the lessons (of whatever type) in which it occurred depend on their general attitudes to school.

Schools have not yet reached the stage of moving from the rationales of government policy towards pedagogical rationales. In schools computers can be used in three main processes: administration, management and teaching and learning, but computers are not yet utilized as a major tool for learning in schools. The reasons for this could be various, a lack of sufficient machines, the lack of available time for using computers in schools, the lack of knowledge, other hardware and software, but especially the lack of interest in pupils to learn from and with computers. It is beyond the scope of this study to discuss the administration and management applications and, therefore, this thesis concentrates on the pupils use of, and attitudes to, computers in schools.

Writers have criticised teachers, funding and curricula but they have tended to ignore the main factors, the students and their experience. The study demonstrates that pupils are not very interested in the school environment in which ICT is associated with academic

demands and tests. They are mostly interested in playing games, going on the Internet and e-mail, all of which are not deemed to appropriate to school. It is too simplistic only to blame teachers and lack of resources. The pupils' lack of interest in learning about computers, learning through computers and learning with the computers needs to be addressed. This generation of pupils come to school more knowledgeable about ICT than previous ones. Despite this their experience, as has been made clear here, is very disappointing.

Delivering IT through the existing curriculum does not seem to benefit pupils. It does not increase their subject knowledge enough. The repetitive nature of the delivery can be tedious and students often become disenchanted with their courses on ICT.

The research concludes that computers used in schools do not extend the pupils' intellectual capabilities or high level skills. Instead they just develop low-level skills a kin to reading and writing. Learning about computers in any form is moving away from a fact oriented environment towards a process oriented learning one, but we do not see any particular improvement in the pupils' achievements. They are instead improving their data processing and word processing skills. Schools are competing with each other to get newer, more and more expensive machines without addressing how they are affecting pupils' attitudes. Computers as so called teaching tools or machines cannot function without the help of teachers. Pupils are moving away from computers due to their lack of interest in learning about them. They see them as just another lesson.

A change in learning can be seen as a change in behaviour. Associating new information with prior knowledge can facilitate the learning process, making it easier for the learner

to store information in their long term memory where there are links to personal experience and knowledge. The change could be an increased or decreased capability for some type of performance. Pupils' attitudes towards the use of ICT need to be changed.

Attitudes towards computers can be determined by the affective or emotional component which contains different cognitive factors of pupils' attitude/behaviour, and then by considering whether the pupils' feelings and willingness in general were negative or positive towards the subject. The researcher concluded that educational software could make a difference to learning about different types of software but not to pupils' attitudes towards the use of computers. Educators are trying to provide a better educational environment, with better machines and tools but have been not giving any substantial or serious thought towards the children themselves (i.e. how can we make them confident and motivated and create positive attitudes towards computers in our schools) or about the overall experience of school in which ICT is embedded.

They do not appear to be greatly interested in using databases and also do not have much understanding of databases. They are not very confident even in using spreadsheets other than how they can be incorporated into using other advanced databases. Lack of pupil interest and lack of time do not allow pupils to use computer in school. There is no doubt that children acquire a curiosity about the world and their immediate physical environment from the primary stage which is not satisfied in schools. In primary schools pupils could become able to work with simple interface equipment to carry out tasks such as controlling a 'turtle' or switching lights, buzzers and switches, but pupils in secondary schools are not encouraged to identify appropriate software packages for specific tasks or applications. They are not able to identify the advantages and limitations of data handling

programmes and do not recognise when these offer solutions to a problem of data handling.

However, ICT cannot make pupils concentrate their attention on specific skills for short periods of time. The repetitive nature of this approach can be tedious and students quickly become disenchanted with their course. No essential change to the way lessons delivered in schools has been seen. Computers are being used for many purposes such as drill and practice, simulations, learning new material, as a tool, as a medium to enhance learning, but they are still not fully integrated into the curriculum as a whole. Pupils interpret the experience of using computers as just another lesson.

Pupils are unsure how they are benefiting from computers and schools themselves are not sure why they are making children learn about computers. As can be deduced from the research pupils are not motivated in their attitudes and behaviour towards the use of computers in school. There is a growing use of computers in schools although many schools have resources which include both old and new machines. However, the central use of computers to enhance learning in schools still far away. All depends on the pupils and their attitudes. They seem do not show great interest in learning about computers although they show more interest in the use of Internet applications and playing games.

The development of software is linked to the development of hardware. The simple programmes prepared for the BBC machines now look unsophisticated and old fashioned. Very little school specific software has been prepared by the software manufactures for more advanced modern computers. It has previously been pointed out that the reason for this is the lack of financial reward from school based software

in comparison to the large sums of money that can be obtained from business type software (and from games). Most of the new software in schools is menu driven. A busy person in school, such as a teacher, may get only a certain amount of understanding from a package sufficient to satisfy the immediate needs, but is not able to utilize the package completely. Pupils do not show an interest in using the packages. They are not very keen to learn about computers in schools for academic purposes. This could be due to the complexity of the software, pupils' alternative interests, the absence of motivation, enjoyment and commitment towards the use of the computers.

As derived from the analysis of both qualitative and quantitative data, computer use in most of the schools is associated with work rather than pleasure. Pupils have a mixture of positive and negative attitudes towards computers. On the whole, pupils expressed positive views to the researcher when she asked them "What do you think about computers"? They commented that they enjoyed learning about computers and that computer skills were not hard to learn, but they still had some difficulties in dealing with them. Most of them mentioned that they wanted the school to provide them with more time to practice. If not, they would be left with two choices. One is to join a private computer institute and the other is to buy a home computer. Children of low-income parents who could not afford either of the two choices would be disadvantaged. One of the pupils commented "What I learn this week I forget by the next week, because the time between the two lessons is long". Another pupil said "I asked my parents to buy me a computer for my birthday but they couldn't afford to get one". Despite the general malaise demonstrated by their attitudes to school, there remained recognition that learning how to use computers is an important skill. Unfortunately, this learning is not

associated with school.

Computers in school should be used as a tool for playing as well as for learning, thereby increasing pupils' pleasure and familiarity with their use. This will develop better attitudes, confidence, ability and self-motivation with regard to computers and greater confidence in using them. These process skills will stand pupils in good stead for later life.

On the whole most students perceived school as a necessary waste of time. They are sent to learn but whilst they submit to the work of school they do not express much pleasure or commitment. ICT is affected by this attitude. Many students do not enjoy or even understand ICT. They would rather socialise with their friends than apply themselves to learning how to use the new technology.

Summary

The evidence leads to certain conclusions. In order for learning to be effective several conditions are necessary.

- A non-threatening learning environment for active learning to take place in which pupils can propose and test out ideas. The delivery needs to be supportive, while still evaluating their efforts. Computers do not in themselves provide a friendly and non-threatening environment for each pupil whether working individually or in a group. This is partly because many pupils fear losing their work if they strike a wrong key by mistake or cannot log on easily. Machines in schools tend to be old and slow so there is also a fear of missing their work or not completing their work on time.
- Schools need to be involved in the learning process in order to maximize the

possibilities for active learning. Both teachers and pupils have to establish some common goals about how learning is to take place. Pupils cannot easily work through each step in certain topics or jump several steps because they do not have enough time and do not always understand their tasks properly.

- Learners should be provided with the opportunity to take decisions about the content of their own learning. This process of learning with computers does not at the moment give learners an opportunity to choose what they want to learn, evaluate their learning and decide about further directions in which they wish to move. However, they can display their learning to others easily. Pupils cannot go on and learn beyond what they have already learned in the classroom. They only do what they are told to do by their teachers.
- Direct skill teaching provides opportunities to participate in group work in addition to some cooperation and negotiation of direct skills. Using a computer to learn the skills can become a mechanical routine rather than a creative one. Pupils can learn skills of reading, typing, playing games, e-mail and using the Internet but computers remain part of the standard teaching process
- The learning process needs to be set within the context of everyday life so that understanding concept is likely to be understood for longer. It is probable that all pupils will have to use computers at some stage at their working life, but they do not find their work pleasurable, enjoyable or even interesting for most of the time.

The overall aims of the study have been to investigate and compare the modes of computer use in secondary schools and evaluate the effects on pupils' attitudes towards computers. In the course of the study this researcher has sought to achieve these aims by:

- identifying the present mode(s) of computer use in secondary schools
- reviewing previous research and relevant literature regarding the use of computers
- examining pupils' attitudes towards computers
- identifying factors that affect pupils' attitudes towards computers.

From the researcher's point of view, the qualitative approach provided data which gave a clearer picture of what was happening in schools concerning computer use. On the other hand, the quantitative approach provided evidence about the ways in which computers are used in schools. The conclusions that the researcher is able to describe in this chapter reflect the importance of the evidence which the qualitative and quantitative approaches have provided.

The findings of the present study indicate that there are three uses of computers in schools: learning about computers in computer studies (academic); learning from computers in CAL or IT (cross-curricular) and learning with computers or to be able to use computers in IT (vocational). The findings from this study are listed below.

- The main method of computer use has been shown to be learning about computers as an academic subject. However, this situation is changing towards using ICT in special lessons and then applying the skills learnt through ICT into other subjects of the school curriculum.
- Most computers in schools are confined to specialist areas rather than being pervasive. Most schools still rely on 'computing' skills courses.
- The majority of schools use computers for purposes such as in drill and practice, tutorials and simulations. Computers are used in schools as a tool such as in word-processing, spreadsheets, graphics, database and desk-top-publishing.

- Computers can be used in most schools to develop problem solving strategies, communication, measurement and control, logical thinking, modelling, handling information and evaluation of applications but most of these strategies have not been developed.

The researcher considers that it would be advisable to move towards using computers across the curriculum subjects. The issues relating to this solution include the need for in-service training for teachers to do the job, the availability of more funds and good quality software. Pupils have not acquired positive attitudes towards their competence in using computers inside or outside school.

The possible reasons are that:

1. ICT courses are set up to be mainly practical, while computer studies courses are designed to capture higher ability pupils' interest in computers and encourage them to go on to higher education with some theoretical knowledge about computers and hardware;
2. ICT courses are set up for pupils of all abilities. Computer studies courses are designed for more able pupils.

The findings of the pupils' questionnaire, demonstrate a negative attitude towards computers. Interviews were carried out with selected pupils in order to obtain further evidence relevant to the factors that affect pupils' attitudes towards computers. Pupils' willingness to accept computer technology or reject it may be affected by their attitudes. Therefore, it is important that pupils' attitudes and beliefs about computers are understood and taken into consideration.

Although computers were in more use across the curriculum the provision of ICT across the curriculum is not uniform. The National Curriculum requires computers to be used across all subjects of the school curriculum, but at the moment this is not widespread.

One of the aims set out in the introduction was to make explicit conclusions and recommendations. The researcher has identified following recommendations:

- Increased encouragement should be provided for teachers who are willing to use computers in their subjects.
- Educational games should be encouraged and used in schools by pupils at least in their free time; for the time being ICT is used in some subjects of the school curriculum and by some teachers. There is supposed to be a move towards using ICT in all subjects within the curriculum as recommended by the NC.
- Teachers should consider using ICT facilities in their subjects More teachers should become computer competent so they can demonstrate the use of the teaching in every subject area and become natural part of the teaching and life; if ICT facilities are used competently in school, then there would be no need for separate ICT. Each subject teacher must not only be competent in using the equipment but must also be proficient in using it in her/his teaching.

Limitations of the study

Computers, and schools, are constantly evolving. Whilst the pupils could accept the importance of computers in their lives, including at home, they found the delivery in schools boring. The research was carried between the years 2002 and 2004, and the

findings whilst valid, are always subject to change. The essential empirical message is clear, that there is a gap between the hopes for computing and the reality. We cannot really enhance ICT without facing up to this.

This is, however, what teachers are constantly doing. There is pressure on schools to change. Whilst the sample of schools took in a wide socio-economic range it could be that the particular local authority is less advanced than elsewhere in the country.

14.3. How have things changed since the data were collected?

Key Stage 3 National Strategy has become more embedded in the school. The purpose of this strategy is to encourage teachers to develop best practice. Key Stage 4 Statutory requirements require ICT to be part of a small core of compulsory subjects (Qualification and Curriculum Authority 2004).

The Department for Education and Skills (2004) wrote that

“The past five years have seen a slow but steady improvement in pupils’ achievements in ICT capability, the quality of teaching, and the leadership and management of ICT...The complementary use of ICT across subjects, however, has been slow to develop and is uneven across schools and subjects ...”(p.2)

It is to be hoped that, whilst progress has been slow, the many efforts to address the problems, often deeply embedded in the schools, will be successful.

14.4. Ideas for further research?

- To explore pupils use of computers at home.
- To look at schools which are trying to embed computers in all lessons.
- To explore different types of software, from pupils point of view.

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Appendices

Appendix A

Pilot Study Questionnaire

Dear Students:

Please fill this questionnaire in rapidly and honestly. The results will be treated as anonymous and confidential and your help is greatly appreciated for this important research.

Gender: M

F

No.	Questions	Yes	No	For Office use only
1	How many days on average per week are you asked to use computers in school?			
	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 or more			<input type="checkbox"/>
2	Do your teachers give you instructions before you start to work on computers in the classroom?			<input type="checkbox"/>
3	Do you use computers for pleasure in school?			<input type="checkbox"/>
4	Do you use computers in school only for academic work?			<input type="checkbox"/>
5	Do you play games on the computers in school?			<input type="checkbox"/>
6	Do you find computers interesting to use in school?			<input type="checkbox"/>
7	Do you use computers individually in the classroom?			<input type="checkbox"/>
8	Do you prefer to use computers individually?			<input type="checkbox"/>
9	Do you usually work with computers in groups in classroom?			<input type="checkbox"/>
10	Do you learn to use computers better by sharing with other pupils?			<input type="checkbox"/>
11	Do you have the access to Microsoft word on your computer?			<input type="checkbox"/>
12	Do you use computers in the school library for the library catalogue?			<input type="checkbox"/>

No	Questions	Yes	No	For Office use only
13	Do you use computers in English?			<input type="checkbox"/>
14	Do you use computers in Mathematics?			<input type="checkbox"/>
15	Do you use computers in Science subjects?			<input type="checkbox"/>
16	Do you use computers in History?			<input type="checkbox"/>
17	Do you use the computers in Economics?			<input type="checkbox"/>
18	Do you use the computers in Home Economics?			<input type="checkbox"/>
19	Do you use computers in Geography?			<input type="checkbox"/>
20	For how many hours do you use computers in the school approximately per week?			
	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 2px 10px;">1</div> <div style="border: 1px solid black; padding: 2px 10px;">2</div> <div style="border: 1px solid black; padding: 2px 10px;">3 or more</div> </div>			<input type="checkbox"/>
21	Do you use computers for drawing pictures?			<input type="checkbox"/>
22	Do you think that using a computer is more interesting than other methods of learning?			<input type="checkbox"/>
23	Do you have a computer at home?			<input type="checkbox"/>
24	Do you use it daily at home?			<input type="checkbox"/>
25	Is the computer you use at home your own?			<input type="checkbox"/>
26	Do you use computer to do your homework?			<input type="checkbox"/>
27	Do you think that it is more interesting to use a computer at home than in school?			<input type="checkbox"/>
28	Do you use computer for playing games at home?			<input type="checkbox"/>
29	An average how much time you use computer at the home per day approximately?			
30	Occasionally.			<input type="checkbox"/>
31	Several times.			<input type="checkbox"/>
32	One hour per day.			<input type="checkbox"/>
33	Two hours per day.			<input type="checkbox"/>
34	Three hours per day.			<input type="checkbox"/>
35	Do you use the Internet			

No	Questions	Yes	No	For Office use only
36	Do you use computer to e- mail your friends?			<input type="checkbox"/>
37	Do you think that you can get more information by using computers than by other means e.g.; books, teachers?			<input type="checkbox"/>
38	Do you think using computers is a waste of time?			<input type="checkbox"/>
39	Do you think that by the use of computer you can save time?			<input type="checkbox"/>
40	Do you always save your work on the computer? If so on :			
41	<input type="checkbox"/> On hard drive <input type="checkbox"/> On floppy disk <input type="checkbox"/> both			<input type="checkbox"/>
42	Is it easy for you to find previous work?			<input type="checkbox"/>
43	Is the computer you use at home compatible with the computers you use in the school?			<input type="checkbox"/>
44	Do you think that it is easy to do work using computer than using work sheets and books?			<input type="checkbox"/>
45	Do you think that the use of computers makes you more creative?			<input type="checkbox"/>
46	Do you think that the use of computers is boring?			<input type="checkbox"/>
47	Do you think that the use of computers is tiring?			<input type="checkbox"/>
48	Do you think that it is very important to learn the use of computers?			<input type="checkbox"/>
49	Do you think that learning to use computers will be helpful for your future?			<input type="checkbox"/>
50	Do you enjoy using computers?			<input type="checkbox"/>

Thank you very much for your cooperation.

The Researcher

Appendix B
QUESTIONNAIRE

SCHOOL (1)

YEAR GROUP (9)

- Please help us by answering these questions by putting a tick in the boxes on the questionnaire as shown
- For some questions you will have to put a tick in just one box, but for others you may put a tick in more than one
- Please read the questions carefully and answer according to your own opinion
- Your help is greatly appreciated and your opinion taken seriously. The information will remain confidential and anonymous.
- **NOTE : Please use the lead pencil only.**

- 1) Do you use computers in school?
- A) Yes
- B)No
- 2) What type of computers do you use in school? **(Please tick all that applies).**
- A) PC (Windows machine)
- B) Acorn
- C) Macintosh
- D) Others (please specify.....)
- 3) Please indicate on average for how many hours per week you usually use computers in school **(Please tick only one).**
- A) 1 hour
- B) 2 hours
- C) 3 hours
- D) 4 hours
- E) 5 hours
- 4) Do your teachers give you instructions before you start to work on computers in school?
- A) Yes
- B) No
- 5) If 'YES' do they give you instructions: **(Please tick only one).**
- A) Always
- B) Frequently
- C) Sometimes
- D) Hardly Ever
- E) Never
- 6) What ways do they give instructions? **(Please tick all that applies).**
- A) Writing on boards
- B) Handing out help sheets
- C) On screen help
- D) Verbal instructions
- 7) If your teachers give instructions, do they give them : - **(Please tick all that applies).**
- A) Individually
- B) In small groups (3-5 individuals)
- C) In large groups (5 and above)
- D) To the whole class
- E) As you need help
- 8) Do you use computers in school for playing games?
- A) Yes
- B) No

9) If you play games in school which type of games do you play? (Please tick all that applies).

- A) Educational games
- B) Role play
- C) Action games
- D) Strategy games
- E) Sport based games

10) If you play games in school when are you allowed to do so? (Please tick all that applies).

- A) During ICT lessons
- B) During other lessons
- C) Outside lessons
- D) In the library
- E) In computer clubs

11) If you find it pleasurable what reasons make it so? (Please tick all those apply).

- A) Using them for work
- B) Using Internet
- C) Playing games
- D) Using E-mail
- E) Chatting (Chat room on the Internet)

12) Do you find using computers interesting in school?

- A) Yes
- B) No

If 'YES' to question 12, then answer questions 13, 14, 15, and 16. If 'No' then go to question 'No'17.

13) How interesting is using computers in school? (Please tick only one).

- A) Very interesting
- B) Quite interesting
- C) Interesting
- D) Slightly interesting
- E) Not interesting at all

14) Why do you find using computers interesting in school? (Tick all that applies).

- A) I can do more work
- B) I can work faster
- C) They give lot of information
- D) They make me think differently
- E) They give me different information than I can get elsewhere
- F) They make my work look better
- G) I get better marks

15) In which period do you find using computers most interesting? (Please tick one).

- A) During ICT lessons
- B) During other lessons
- C) Between lesson
- D) After school
- E) In computer clubs

- 16) In which period do you find using computers **least** interesting? (Please tick only one).
- F) During ICT lessons
 - G) During other lessons
 - H) Between lesson
 - I) After school
 - J) In computer clubs
- 17) If you don't find them interesting to use? (please tick all that applies).
- A) They are easy to understanding
 - B) Tasks are too difficult
 - C) Tasks are too easy
 - D) We are always doing the same tasks
 - E) We could complete the work in another way
 - F) Teachers use them in boring ways
 - G) I don't like computers
- 18) In school do you use computers? (Please tick all that applies).
- A) Individually
 - B) In two's
 - C) In small groups (3-5 individual)
 - D) In large groups (5 and above)
 - E) Whole class
- 19) Would you prefer to use computers in school? (Please tick only one).
- A) Individually
 - B) In two's
 - C) In small groups (3-5 individual)
 - D) In large groups (5 and above)
 - E) Whole class
- 20) Do you **learn best** on computers in school when using them: (Please tick one).
- A) Individually
 - B) In two's
 - C) In small group (3-5 individual)
 - D) In large groups (5 and above)
 - E) Whole class
- 21) Do you study ICT as a separate subject in school?
- A) Yes
 - B) No
- 22) How many ICT subject lessons do you have in school every week? (Please tick one).
- A) One lesson
 - B) Two lessons
 - C) Three lessons
 - D) Four lessons
 - E) Five lessons
 - F) None

- 23) How many hours do you do ICT as a separate subject in school every week? **(Please tick one).**
- A) Not at all
 - B) Up to 1 hour
 - C) Between 1 and 2 hours
 - D) Between 2 and 3 hours
 - E) Between 3 and 4 hours
 - F) Over 4 hours
- 24) What do you use computers for in school? **Please tick all that apply.**
- A) Word processing
 - B) Spread sheets
 - C) Internet
 - D) Drawing pictures
 - E) Power point
 - F) E-mail
 - G) Databases
 - H) Others (please specify).....
- 25) How long do you use computers outside ICT lessons per week in school? **(Please only one).**
- A) Not at all
 - B) Up to 1 hour
 - C) Between 1 and 2 hours
 - D) Between 2 and 3 hours
 - E) Between 3 and 4 hours
 - F) Between 4 and 5 hours
- 26) When you have finished how do your save your work in school? **(Please tick all that applies).**
- A) Hard drive
 - B) Zip drive
 - C) Floppy disk
 - D) To the file server
 - E) Don't know how to save my work
 - F) Others (please specify).....
- 27) Do you find using computers in school: **(please tick only one).**
- A) Very enjoyable
 - B) Enjoyable
 - C) Neither enjoyable or un-enjoyable
 - D) Not enjoyable
 - E) Not enjoyable at all
- 28) Do you use a computer at home?
- A) Yes
 - B) No
 - C)

- 29) Who owns the computer at home? **(Please tick only one).**
- A) Father
 - B) Mother
 - C) Brother
 - D) Sister
 - E) You
 - F) We share a family computer
 - G) Others (please specify).....
- 30) What type of computer do you use at home? **(Please tick all that applies).**
- A) PC (Windows machine)
 - B) Acorn
 - C) Macintosh
 - D) Others (please specify)
- 31) Is the computer you use at home compatible with the computer you use in the school? **(Can you move work between them).**
- A) Yes
 - B) No
- 11) How often do you use computer at home? **(Please tick only one).**
- A) Daily
 - B) Weekly
 - C) Monthly
 - D) Not at all
- 33) How many hours do use computers at home **daily? (Please tick only one).**
- A) Not at all
 - B) Up to 1 hour
 - C) Between 1 and 2 hours
 - D) Between 2 and 3 hours
 - E) Between 3 and 4 hours
 - F) Over 4 hours
- 34) In what ways do you use the computer at home?) **Please tick all that apply).**
- A. Word processing
 - B. Spread sheets
 - C. Internet
 - D. Drawing pictures
 - E. Power point
 - F. E-mail
 - G. Games
 - H. Others (please specify).....

35) When you have finished how you do save your work at home? (Please tick all that applies).

- A. Hard drive
- B. Floppy disk
- C. Zip drive
- D. Don't know how to save

36) Is finding what you have saved before: (please tick only one).

- A) Very easy
- B) Easy
- C) Neither easy nor difficult
- D) Difficult
- E) Very difficult

37) Is using a computer at home: (please tick only one).

- A) Very interesting
- B) Interesting
- C) Neither interesting nor boring
- D) Boring
- E) Very boring

If you find using computer interesting at home, then answer to question (38).

If you do not find it interesting to use at home then go to question (39).

38) Why it is more interesting to use computer at home than in school? (Please tick all that applies).

- A) I can work at my own pace
- B) I can decide what to do
- C) No time limit
- D) I decide when to do the work
- E) I have access to more interesting material

39) Do you use computers at home for playing games?

- A) Yes
- B) No

40) If you play games at home which type of games do you play? (please tick all that apply)

- A) Educational games
- B) Role play
- C) Action games
- D) Strategy games
- E) Sport based games

41) How do you feel about using computers at home? (Please tick only one).

- A) Enjoy a lot
- B) Enjoy
- C) Neither Enjoy nor dislike
- D) Dislike
- E) Dislike a lot

- 42) Do you think that by using computers compared to other means e.g.; books and teachers, you can get: **(please tick only one)**.
- A) Much more information
 - B) More information
 - C) The same information
 - D) Less information
 - E) Not much information
- 43) Do you think that using computers is: **(please tick only one)**.
- A) A total waste of time
 - B) A bit of a waste of time
 - C) Neither a waste of time nor a good use of time
 - D) A good use of time
 - E) A very good use of time
- 44) Do you think that by using computers you can save: **(please tick only one)**.
- A) A great deal of time
 - B) A lot of time
 - C) Sometime
 - D) A little time
 - E) No time at all
- 45) Do you think that using a computer rather than worksheets or books to perform a task is: **(please tick only one)**.
- A) Very easy
 - B) Easy
 - C) Neither easy nor difficult
 - D) Difficult
 - E) Very difficult
- 46) Do you think that using a computer is: **(please tick only one)?**
- A) Very exciting
 - B) Exciting
 - C) Neither exciting nor un exciting
 - D) Not exciting
 - E) Not exciting at all
- 47) Do you think that using a computer is: **(please tick only one)**.
- A) Very tiring
 - B) Tiring
 - C) Neither tiring nor un tiring
 - D) Not tiring
 - E) Not tiring at all
- 48) If you find it tiring to use computers why is this? **(Please tick all that applies)**.
- A) The Monitor
 - B) The Chair
 - C) The Mouse
 - D) The Desk
 - E) The keyboard

- F) Others (please specify).....
- 49) Which part of your body experienced discomfort? **(Please tick all that apply)**
- A) Eyes
- B) Neck
- C) Wrist
- D) Hands
- E) Back
- F) Others (Please specify).....
- 50) How worthwhile is it to use computers: **(please tick only one).**
- A) Very worthwhile
- B) Worthwhile
- C) Neither worthwhile nor un-worthwhile
- D) Not worthwhile
- E) Not worthwhile at all
- 51) Do you think that using computers is important?
- F) Yes
- G) No
- 52) If 'YES' how would you rate the importance of using computers:
- A) Very important
- B) Important
- C) Neither important nor unimportant
- D) Not really important
- E) Not important at all
- 53) How helpful is learning to use computers for your future:
- A) Very helpful
- B) Helpful
- C) Neither helpful nor unhelpful
- D) Unhelpful
- E) Very unhelpful
- 54) Do you also use computers in subjects other than 'ICT' in school?
- Yes
- No
- 55) If 'YES' please tick in the box for each of the following subjects **that apply:**
- A) English
- B) Mathematics
- C) Science
- D) Physics
- E) Chemistry
- F) Biology
- G) Business Studies
- H) Physical Education
- I) Design Technology(DT)
- J) DT Food
- K) DT Textiles

- L) History
 - M) Geography
 - N) Religious Education
 - O) Art
 - P) Spanish
 - Q) Music
 - R) French
 - S) German
- 56) Do you use the computer at home to do your home work?
- A) Yes
 - B) No
- 57) If 'YES' please tick in the box on the answer sheet for each of the following subjects that apply:
- A) Information Communication Technology
 - B) English
 - C) Science
 - D) Mathematics
 - E) Physics
 - F) Chemistry
 - G) Biology
 - H) Business Studies
 - I) Physical Education
 - J) Design Technology(DT)
 - K) DT Food
 - L) DT Textiles
 - M) History
 - N) Geography
 - O) Religious Education
 - P) Art
 - Q) Spanish
 - R) Music
 - S) French
 - T) German

Thank you very much for your cooperation.

The Researcher

Appendix C

QUESTIONNAIRE

SCHOOL (1)

YEAR GROUP (10)

- Please help us by answering these questions by putting a tick in the boxes on the questionnaire as shown
- For some questions you will have to put a tick in just one box, but for others you may put a tick in more than one
- Please read the questions carefully and answer according to your own opinion
- Your help is greatly appreciated and your opinion taken seriously. The information will remain confidential and anonymous.
- **NOTE: Please use the lead pencil only.**

- 1) Do you use computers in school?
- C) Yes
- D)No
- 2) What type of computers do you use in school? **(Please tick all that applies).**
- E) PC (Windows machine)
- F) Acorn
- G) Macintosh
- H) Others (please specify.....)
- 3) Please indicate on average for how many hours per week you usually use computers in school **(Please tick only one)**
- F) 1 hour
- G) 2 hours
- H) 3 hours
- I) 4 hours
- J) 5 hours
- 4) Do your teachers give you instructions before you start to work on computers in school?
- A) Yes
- C) No
- 5) If 'YES' do they give you instructions: **(Please tick only one)**
- F) Always
- G) Frequently
- H) Sometimes
- I) Hardly Ever
- J) Never
- 6) What ways do they give instructions? **(Please tick all that applies).**
- E) Writing on boards
- F) Handing out help sheets
- G) On screen help
- H) Verbal instructions
- 8) If your teachers give instructions, do they give them :- **(Please tick all that applies).**
- F) Individually
- G) In small groups (3-5 individuals)
- H) In large groups (5 and above)
- I) To the whole class
- J) As you need help
- 11) Do you use computers in school for playing games?
- C) Yes
- D) No

9) If you play games in school which type of games do you play? **(Please tick all that applies).**

- F) Educational games
- G) Role play
- H) Action games
- I) Strategy games
- J) Sport based games

10) If you play games in school when are you allowed to do so? **(Please tick all that applies).**

- F) During ICT lessons
- G) During other lessons
- H) Outside lessons
- I) In the library
- J) In computer clubs

11) If you find it pleasurable what reasons make it so? **(Please tick all that applies).**

- F) Using them for work
- G) Using Internet
- H) Playing games
- I) Using E-mail
- J) Chatting (Chat room on the Internet)

12) Do you find using computers interesting in school?

- C) Yes
- D) No

If 'YES' to question 12, then answer questions 13, 14, 15, and 16. If 'No' then go to question 'No'17

13) How interesting is using computers in school? **(Please tick only one).**

- F) Very interesting
- G) Quite interesting
- H) Interesting
- I) Slightly interesting
- J) Not interesting at all

14) Why do you find using computers interesting in school? **(Tick all that applies).**

- H) I can do more work
- I) I can work faster
- J) They give lot of information
- K) They make me think differently
- L) They give me different information than I can get elsewhere
- M) They make my work look better
- N) I get better marks

15) In which period do you find using computers **most** interesting? **(Please tick only one).**

- K) During ICT lessons
- L) During other lessons
- M) Between lesson

- N) After school
- O) In computer clubs

17) In which period do you find using computers **least** interesting? (Please tick **only one**).

- P) During ICT lessons
- Q) During other lessons
- R) Between lesson
- S) After school
- T) In computer clubs

18) If you don't find them interesting to use? (Please tick **all that applies**).

- H) They are easy to understanding
- I) Tasks are too difficult
- J) Tasks are too easy
- K) We are always doing the same tasks
- L) We could complete the work in another way
- M) Teachers use them in boring ways
- N) I don't like computers

19) In school do you use computers? (Please tick **all that applies**).

- F) Individually
- G) In two's
- H) In small groups (3-5 individual)
- I) In large groups (5 and above)
- J) Whole class

20) Would you prefer to use computers in school? (Please tick **only one**).

- F) Individually
- G) In two's
- H) In small groups (3-5 individual)
- I) In large groups (5 and above)
- J) Whole class

20) Do you **learn best** on computers in school when using them: (Please tick **one**).

- F) Individually
- G) In two's
- H) In small group (3-5 individual)
- I) In large groups (5 and above)
- J) Whole class

22) Do you study ICT as a separate subject in school?

- C) Yes
- D) No

- 23) How many ICT subject lessons do you have in school every week? **(Please tick one).**
- G) One lesson
 - H) Two lessons
 - I) Three lessons
 - J) Four lessons
 - K) Five lessons
 - L) None
- 23) How many hours do you do ICT as a separate subject in school every week? **(Please tick one).**
- G) Not at all
 - H) Up to 1 hour
 - I) Between 1 and 2 hours
 - J) Between 2 and 3 hours
 - K) Between 3 and 4 hours
 - L) Over 4 hours
- 24) What do you use computers for in school? **Please tick all that apply.**
- I) Word processing
 - J) Spread sheets
 - K) Internet
 - L) Drawing pictures
 - M) Power point
 - N) E-mail
 - O) Databases
 - P) Others (please specify).....
- 26) How long do you use computers outside ICT lessons per week in school? **(Please only one).**
- G) Not at all
 - H) Up to 1 hour
 - I) Between 1 and 2 hours
 - J) Between 2 and 3 hours
 - K) Between 3 and 4 hours
 - L) Between 4 and 5 hours
- 26) When you have finished how do you save your work in school? **(Please tick all that applies).**
- G) Hard drive
 - H) Zip drive
 - I) Floppy disk
 - J) To the file server
 - K) Don't know how to save my work
 - L) Others (please specify).....
- 27) Do you find using computers in school: **(please tick only one).**
- F) Very enjoyable
 - G) Enjoyable

- H) Neither enjoyable or un-enjoyable
- I) Not enjoyable
- J) Not enjoyable at all
- 28) Do you use a computer at home?
- D) Yes
- E) No
- 30) Who owns the computer at home? (Please tick only one).
- H) Father
- I) Mother
- J) Brother
- K) Sister
- L) You
- M) We share a family computer
- N) Others (please specify).....
- 30) What type of computer do you use at home? (Please tick all that applies).
- E) PC (Windows machine)
- F) Acorn
- G) Macintosh
- H) Others (please specify)
- 31) Is the computer you use at home compatible with the computer you use in the school? (Can you move work between them).
- C) Yes
- D) No
- 13) How often do you use computer at home? (Please tick only one).
- E) Daily
- F) Weekly
- G) Monthly
- H) Not at all
- 34) How many hours do use computers at home daily? (Please tick only one).
- G) Not at all
- H) Up to 1 hour
- I) Between 1 and 2 hours
- J) Between 2 and 3 hours
- K) Between 3 and 4 hours
- L) Over 4 hours
- 36) In what ways do you use the computer at home?) Please tick all that applies).
- I. Word processing
- J. Spread sheets
- K. Internet
- L. Drawing pictures
- M. Power point
- N. E-mail
- O. Games

P. Others (please specify).....

37) When you have finished how you do save your work at home? (Please tick all that applies).

- E. Hard drive
- F. Floppy disk
- G. Zip drive
- H. Don't know how to save

41) Is finding what you have saved before: (please tick only one).

- F) Very easy
- G) Easy
- H) Neither easy nor difficult
- I) Difficult
- J) Very difficult

42) Is using a computer at home: (please tick only one).

- F) Very interesting
- G) Interesting
- H) Neither interesting nor boring
- I) Boring
- J) Very boring

If you find using computer interesting at home, then answer to question (38).

If you do not find it interesting to use at home then go to question (39).

43) Why it is more interesting to use computer at home than in school? (Please tick all that applies).

- F) I can work at my own pace
- G) I can decide what to do
- H) No time limit
- I) I decide when to do the work
- J) I have access to more interesting material

44) Do you use computers at home for playing games?

- C) Yes
- D) No

45) If you play games at home which type of games do you play? (please tick all that apply)

- F) Educational games
- G) Role play
- H) Action games
- I) Strategy games
- J) Sport based games

42) How do you feel about using computers at home? (Please tick only one).

- F) Enjoy a lot
- G) Enjoy
- H) Neither Enjoy nor dislike
- I) Dislike
- J) Dislike a lot

- 46) Do you think that by using computers compared to other means e.g.; books and teachers, you can get: **(Please tick only one)**.
- F) Much more information
 - G) More information
 - H) The same information
 - I) Less information
 - J) Not much information
- 47) Do you think that using computers is: **(Please tick only one)**.
- F) A total waste of time
 - G) A bit of a waste of time
 - H) Neither a waste of time nor a good use of time
 - I) A good use of time
 - J) A very good use of time
- 48) Do you think that by using computers you can save: **(Please tick only one)**.
- F) A great deal of time
 - G) A lot of time
 - H) Sometime
 - I) A little time
 - J) No time at all
- 49) Do you think that using a computer rather than worksheets or books to perform a task is: **(Please tick only one)**.
- F) Very easy
 - G) Easy
 - H) Neither easy nor difficult
 - I) Difficult
 - J) Very difficult
- 47) Do you think that using a computer is: **(Please tick only one)?**
- F) Very exciting
 - G) Exciting
 - H) Neither exciting nor un exciting
 - I) Not exciting
 - J) Not exciting at all
- 48) Do you think that using a computer is: **(Please tick only one)**.
- F) Very tiring
 - G) Tiring
 - H) Neither tiring nor un tiring
 - I) Not tiring
 - J) Not tiring at all
- 49) If you find it tiring to use computers why is this? **(Please tick all that applies)**.
- G) The Monitor
 - H) The Chair
 - I) The Mouse
 - J) The Desk
 - K) The keyboard

L) Others (please specify).....

49) Which part of your body experienced discomfort? **(Please tick all that apply)**

G) Eyes

H) Neck

I) Wrist

J) Hands

K) Back

L).....Others (Please specify).....

51) How worthwhile is it to use computers: **(please tick only one).**

H) Very worthwhile

I) Worthwhile

J) Neither worthwhile nor un-worthwhile

K) Not worthwhile

L) Not worthwhile at all

53) Do you think that using computers is important?

M) Yes

N) No

54) If 'YES' how would you rate the importance of using computers:

F) Very important

G) Important

H) Neither important nor unimportant

I) Not really important

J) Not important at all

58) How helpful is learning to use computers for your future:

F) Very helpful

G) Helpful

H) Neither helpful nor unhelpful

I) Unhelpful

J) Very unhelpful

59) Do you also use computers in subjects other than 'ICT' in school?

Yes

No

60) If 'YES' please tick in the box for each of the following subjects **that apply:**

T) English

U) Mathematics

V) Science

W) Physics

X) Chemistry

Y) Biology

Z) Business Studies

AA) Physical Education

BB) Design Technology(DT)

CC) DT Food

- DD) DT Textiles
- EE) History
- FF) Geography
- GG) Religious Education
- HH) Art
- II) Spanish
- JJ) Music
- KK) French
- LL) German

61) Do you use the computer at home to do your home work?

- C) Yes
- D) No

62) If 'YES' please tick in the box on the answer sheet for each of the following subjects that apply:

- U) Information Communication Technology
- V) English
- W) Science
- X) Mathematics
- Y) Physics
- Z) Chemistry
- AA) Biology
- BB) Business Studies
- CC) Physical Education
- DD) Design Technology(DT)
- EE) DT Food
- FF) DT Textiles
- GG) History
- HH) Geography
- II) Religious Education
- JJ) Art
- KK) Spanish
- LL) Music
- MM) French
- NN) German

Thank you very much for your cooperation.

The Researcher

Appendix D

Interview Questions (Standard Questions)

- Would you like to tell me please which lesson you are coming from?
- Do you like ICT?
- Is it interesting to use ICT?
- Would you like to tell me please how do you spend your time in school?
- Would you like to tell me please what do you do for most of the time in school?
- Would you like to tell me please how much time do you actually spend working in school?
- Would you like to tell me please about your experience in school?
- Would you like to tell me please why do you come to school?
- Would you like to tell me please do you like to come to school?
- Do you use the Internet in school?
- Are you allowed to use the Internet?
- Do you use computer as a separate subject in school?
- Do you think that computers are important?
- Do you learn a lot from your teachers?
- Any thing else you want to say?
- Do you think that is there any difference in using computers in school and at home?

Appendix E (Interview Transcripts)

School No. 1 (Girl)

- Researcher. Would you like to tell me please, how do you spend your time in school?
Girl. I go to lessons, see my friends, I just like get on with my work and then, I have my timetable with my friends. At lessons I learn, but not all the time. Erm... I talk to my friends. Um... like play games and stuff, have a joke, have a laugh, messing about with my friends.
- Researcher. Do you mess about in your lessons?
Girl. Yeah! I do.
- Researcher. How does your teacher react to this? Does he get annoyed?
Girl. He just say's to be quiet or like stop talking. I don't listen to him, I just like having a laugh with my friends.
- Researcher. Would you like to tell me please what do you think school is for?
Girl. To learn, but also have fun, meet with your friends and get disciplined as well, by like the teachers
- Researcher. Why do you come to school?
Girl. Um...why do I come to school? Erm...because I enjoy it, I see my friends, being with them and having a laugh. I like some my lessons as well. But if I don't like the lesson I don't listen to the teachers, but so then I suppose I don't pay that much attention to the teachers. Just talk with my friends, being with them and having a laugh really.
- Researcher. What do you do for most of the time in school?
Girl. I don't know, probably working. Erm... working and talking with my friends.
- Researcher. Which lesson are you coming from?
Girl. IT
- Researcher. Do you like it?
Girl. Yeah, I do. Erm... I have started to enjoy it more because of the work we are doing now. It was a bit boring at the beginning. Because I just talked and didn't pay attention. I know more than I used to, so now I am more used to it.
- Researcher. What do you do for most of the time in school?
Girl. Erm... learn, get on with my mates and my work, I talk to my friends because they are like in my class. I just talk to them and have more fun. Have a laugh.
- Researcher. How much time do you actually spend working in school?
Girl. I don't erm... erm...we have 5 lessons each day and we like an hour of each lesson. And we spend probably 30 minutes working and the other half just doing registration, and finding out what the work is going to be about. And of the other time we mess about as well. Erm... erm... and during that we like erm... erm... we talk and stuff and you know. If I am away from my friends then I do my work but I don't enjoy it much. I don't like writing much or all

the time. I like drama because we do erm... like lots of different activities. I don't like to just erm... write all the time.

Researcher. If you don't like to work then why do you come to school?

Girl. Because I enjoy coming to school. If I won't go I would miss a all the good things schools give you. And then I'm not going to a good job, without having a good education. And how can I make new friends if I don't come to school.

Researcher. Would you like to tell me please about your experience in school?

Girl. I enjoy everything about it. Erm ... I like the lessons, most of the people. Like in school people come from different other schools. Erm... because there is different races, nationalities who come to school. Not just the colour but the backgrounds as well.

Researcher. You can friends at home on your street but why do you think that school is a good place to make friends?

Girl. Because I spend a lot of my time in school, so I suppose I really need mates who are school to have a chat with and a laugh, otherwise it would probably boring. If my friends are not in school. Maybe I will concentrate less because you fell sorry for yourself and bored. Mates make you happier like you can have a laugh and a joke with them and erm... talk

Researcher. Do you the Internet at home?

Girl. At home I do. But at school we are not really allowed to use them in school.

Researcher. Why are you not allowed to use the Internet at school?

Girl. I don't know they just put a block on it. Erm... I have only been on it a couple of times this year.

Researcher. Do you think its different using computers at home and at school?

Girl. Yeah! Are home you free to do what you want. You're free to on any like erm web pages. Like you can play games and stuff at school you can't do that I can use the Internet when I want to and how as well.

Researcher. Is there anything you want to tell me about your experience in school, friends and your work?

Girl. I like to come to school. Not just because I am thinking of the future. I just like to come to school. Erm... it's good to socialize, to see your friends and to just have a laugh.

Researcher. Anything else?

Girl. No.

School No. 2 (Girl)

- Researcher. Would you like to tell me please what do you do for most of the time I school?
- Girl. First I meet my friends at school. Then I go to class for registration and assembly for about 20 minutes. Then we have two lessons. Then we go for break, meet my friends. We might be late for next lesson. So time is taken out. We have a lesson for about 55 minutes. Then we have lunch break for an hour. Then we have two lessons. Registration again for about 10 minutes. Then we have two lessons and then its home time.
- Researcher. How much time do you spend in school?
- Girl. About 6.30 hours. We come to school at 8.50 and leave at 3.20.
- Researcher. Would you like to tell me please how much time do you spend actually working in school?
- Girl. We come to school for about 6.30 hours. But in theory we work for about 4 hours and 45 minutes. Lessons are about 55 minutes long, not actually a full hour. We waste some time changing lessons. Em... we might meet our friends on our way and walk around and go late to our lessons. An hour and 15 we have break and lunch. We actually waste some time and we don't go to lesson on time and if someone comes in later then the teacher has to start all over again and he gets annoyed. Em...so we have to waste some of our time if we or someone's comes late. If they are late they have to make the time up the end. Like 5 minutes. Um... but we still waste 5 minutes of our time. Em...depending how late they were. So we do not work all the time in school. I talk to my friends and walk around the school. Um... we might go to library.
- Researcher. What do you do in library?
- Girl. Um...um... when we have spare time go to library and do homework. And use the computers in the library and those people who have not computer at home can use in the library.
- Researcher. How long do you use computers in school?
- Girl. Because we don't have the computers in our classroom we have separate computer room so it takes time. Like we have to leave our bags and go at the beginning of the lesson and at the end we have to go back to the next class. So like going there and going back to the lessons. Em...then the teacher the IT person tells us what we need to do. It takes about 15-20 minutes. Sometimes he just go on and on and we only have left little bit of time to do our actual work. If the teacher didn't not go on for so long we might have more done and get more marks. We actually in the lesson use computers em...em...may be for 20 minutes.
- Researcher. Do you think the amount of time you spend on using computers is enough?
- Girl. Em...no I don't think its enough because like I said just like more and more stuff coming about computers. You need a lot more time. If we had more practice on it we would be lot quicker and would know how to use it better. I think it should be 1-hour everyday.
- Researcher. Do you use computer on its own in the school?

- Girl. No, we don't have it as a separate subject. But if you want to pick it up as separate subject. Then you can pick it this year (in year 9) and you study it next year (year 10 and 11). That's all.
- Researcher. In which subjects do you use computers in school?
- Girl. Um...it depends which lesson I have um...because I could do the homework at school. But I will not if its long.
- Researcher. Which subjects do you like the most?
- Girl. I like PE because I like running around. Its better than just sitting down. And then I like History. And we use computers in History. Do search on the Internet. Because it's the best way of searching any subject and its easy to look up.
- Researcher. Are you allowed to use the Internet in school?
- Girl. Yeah! you need permission though to go on the Internet. Otherwise you are not allowed to do that without permission slip. Teachers can see what we are doing. Are we doing any work or not and if we are not doing our work they don't let us to use the Internet. We can just use the WWW.Google.com. I just type it then press enter and get all the information.
- Researcher. Do you think that all those information you get from the Internet you can understand?
- Girl. Em...sometimes you think em...this is what I didn't search for. But I don't know why this is come up and I don't understand it but sometimes it really helps you.
- Researcher. Do you get help from your teacher when you go onto the Internet?
- Girl.]Em... no. you don't need help because the information is easily available. I don't need teachers.
- Researcher. If you think that you don't need teachers then why do you come to school?
- Girl. Em...to get an education, get certificate and go to college and university. Meet my friends because at home you just waste the time just watching TV. Em...something like kids programmes come like 4.00 o' clock. Em... when I come home from school. If my friends weren't there em...I probably wouldn't like to go to school. They make school and lesson as well more interesting. I go to school because when I finish school I can go to higher education. I can get a good job when I grow older. And I wouldn't go if my friends weren't there as much. I probably would go but not as often as much if they were there. Because they make more fun. I don't like teachers all the time because they are really horrible. They don't have nice attitude but some of them em... they are nice. If I come to just learn things em... it might be a waste of time.
- Researcher. Do you think schools are really a waste of time?
- Girl. Now I think but when I grow older then I probably regret if I didn't go to school. Em... em...I can understand now but some people might not understand that.
- Researcher. Do you think that you learn a lot from your teachers?
- Girl. No, em...it is their job to like learning subjects to us but its upto the teachers if they can make it interesting to us. Like and if they if they are nice in nice mood, um... and they got nice personality and they will. If they are boring and

horrible then you don't learn that much. Because they don't interesting to learn.

Researcher. Do you think that all teachers are same?

Girl. No, not all some teachers might make it interesting to learn. We do learn from them but not a lot

Researcher. What do you think that how they can make it interesting?

Girl. If they will involve group like I work with my friends then that's lot more interesting because I can work and talk as well. If teachers know we are talking then it doesn't matter because they also know that you are also working and talking so it doesn't matter. So they are happy we are happy.

Researcher. Would you like to tell me please about your experience of using computers in school and at home?

Girl. Its easy because I learn stuff at home and come to school and use it. I like using computer at home you can do whatever you want and in school you do it for work. At home you can play games on computers. You can watch films. You can make like shop on line. I prefer to learn at school because more people of my age. But teachers make it boring. Its more boring in school than at home. I find it much more interesting at home. It is a lot more fun at home than working in school and listening to teachers. Its more boring and tiring in school than at home.

Researcher. Do you think that computers are just associated with schools?

Girl. No, you can probably learn it anywhere else like in evening classes. But I like to learn it at home because I like to use it own my own. Because I can get on faster on my own.

Researcher. Do you think that learning about computers is useful/important?

Girl. Yeah! a lot. You can start your work as secretary on something. You can em...its so much easier looking to database in the computer and going through so many files. It saves you time. It is very important because like before a lot of people have been em...their jobs have been cut because machines had replaced them and em...that's probably that's gonna happen even more now and people can control them and understand properly. If they learn how to use computers.

School No. 3 (Boy)

- Researcher. Would you like to tell me please how do you spend your time in school?
- Boy. I spend my time hanging about with my mates, playing football, playing rugby, messing about and stuff like that. Just messing about, going to the library and go to lessons. Some of the lessons are I really like and get on with them. Some of them are really boring like History, ICT Maths and Geography. I don't really like. I don't really get on with them.
- Researcher. Would you like to tell me please what do you do for most of the time in school?
- Boy. Em...most of the time in school, mess about with my friends, go to lessons. Some lessons are bit boring and just getting fed up with. And sometimes you get bored and you just don't really wanna work. So teachers should try to make in lessons more fun and interesting. Like you have been working a lot. You like to have some break during the lessons like watch video, discussion stuff like that because you just want break. I like to be with my friends in lessons. I think any body would.
- Researcher. Would you like to tell me please what is school for?
- Boy. School for just meeting new people and for learning. Like if you just got few friends you can make new friends in school. I think its easier to make friends in school than its on your street. Like the people from your street if you know them they might go to a different school. You might not be able to talk to them as much you do with your friends in school. You can only go out at night really and at the weekend with the people on your street. But you like see your mates all the time in school. And em...school is a big place so you can make lots of many friends. So yo are all right. Like if you fall off one of them you get lots of other to be with. Em...I don't know what else to say.
- Researcher. Would you like to tell me please how much time do you actually spend working in school?
- Boy. Well! You come to school in the morning. You talk to your friends and then you go to some lessons but you don't work all the time. You have break in between, talk to your friends and you go back to do some work and talk to your friends. Then you have your dinnertime and you go out and play football and stuff like that. Then you have other lessons and talk to your friends half way through and then its time to go home.
- Researcher. What your teacher do when you talk in lessons?
- Boy. Well! Em... sometimes tells us off and gives us detention and stuff like that.
- Researcher. Would you like to tell me please about your experience in school?
- Boy. My experience in school is not too bad. Because I am enjoying it. But when you se people been bullied and stuff you just don't like it. But I am friend with people. I like to see every body smiling and laughing about. Just stuff like that and playing football.
- Researcher. Do you use the Internet in school?
- Boy. Em...yeah! sometimes you can use the Internet in lessons like History and Geography. Sometimes you like it and sometimes you can really get fed

up with it.

Researcher. Do you think that the information you get from the Internet are useful and you understand all?

Girl. Em...um...sometimes but all the time. Like sometimes you can take it in. But other times you can't because some of it is really difficult to understand.

Researcher. Do you use computer at home?

Boy. Yeah! I use my computer at home. most of the time I am on the Internet so I am always talking to people on chat site and stuff.

Researcher. Do you think that is there any difference in using computers in school and at home?

Boy. Em...em...the difference is different atmosphere and you can relax at home. Sometimes you feel bit tense in school.

Researcher. Do you think that learning to use computer is useful?

Boy. Em...no.

Researcher. Why do you think its not useful to learn about computers?

Boy. Em...yeah! I don't know.

Researcher. Do you think that computers are important?

Boy. I don't know you can probably do with out computers. They are not very important.

School No. 4 (Boy)

- Researcher. Would you like to tell me please how do you spend your time in school
- Boy. I meet up my friends at the beginning and then we walk for a bit, go to lessons. At break time I go to my form talk bit more about what we have gonna do after school, play football and cricket. I got some good friends hang about with them. Finding interesting talking to my friends in lessons otherwise its boring really like if no one to talk to. Sometimes we do mess about in lessons and have good time really. Like if the work is boring we talk about what we got to do and sometimes we make fun of each other.
- Researcher. When you talk in lessons what your teachers do?
- Boy. In lessons we are not suppose to talk. Teachers give us warnings and if we go the whole sequence it leads up to 40 minutes detention. That's it really and if carry on they write our names on board.
- Researcher. Would you like to tell me please what do you do for most of the time in school?
- Boy. Play football and mess around in the ground. Spend most of my time with my friends but split up in some lessons. Find the lessons boring if I am split up because there is no friends to talk to. Schools are a good way of making friends and meet more people. My friends are good friends. I get on with them and play football with them.
- Researcher. Would you like to tell me please what is school for?
- Boy. To get education, get along with every one, make new friends, messing about and socialising that's really important because as you grow older you need friends to help, to get go on if you struck or having hard time. You need your friends to socialise with them and tell them about your problems I think.
- Researcher. But you can make friends at home or on your street then why just in school?
- Boy. Because there are lots of people of different age groups. Where at home more younger people on your street. So its easy to make friends in school and there are different clubs and things and you can meet friends there as well.
- Researcher. Would you like to tell me please hoe much time do you actually spend working in school?
- Boy. Usually 40 minutes lessons I spend about 25 minutes because when I have done my work I spend my time talking and messing about really. At break time I go to tuck shop with my friends, get some sweets and go back to lessons and at dinner sometimes its boring but we just talk and mess around really. Some lessons are boring I don't work hard in those lessons.
- Researcher. Would you like to tell me please about your experience in school?
- Boy. I think it's a good way of meeting people, getting education and I think its a good place to socialise as well. It's a big place, a lot of walking around to do as well.
- Researcher. Do you use a computer at home?

Boy. Yeah!

Researcher. Do you think that is there any difference in using computers in school and at home?

Boy. Em...well! In school we just do work typing things but at home I play on computer games and talk to my friends on the Internet.

Researcher. Do you think that learning to use computer is useful?

Boy. Um...yeah you can say but I don't know.

Researcher. Do you think that computers are important?

Boy. Yeah! but very important.

Researcher. Any thing else do you want to say?

Boy. No, not really.

Appendix F

Computer, Schools and Home

This is an example of the rich extra material which cannot fit into the confines of the thesis

Introduction

As this study pupils attitude towards the use of computers, the effective reactions in school and at home were also examined. Analysis of information gathered thus for supports the researchers hypothesis that ICT has still not been fully integrated into the education system and does not support students learning strategies in any meaningful manner. Moreover it appears that a fully and complete overhaul of teaching and learning styles would be necessary in order to bring about a full integration. The effective teaching and learning strategies for ICT require planning, performance, maintaining and evaluation in those schools where students are able to access ICT.

There has been a growth of literature exploring the difference in attitudes towards using computers at home. Most of this research has been constrained by the availability of home computers to the user, the quality of that equipment to that used in school.

Fiona Smith and John Barker (2002); conducted a research on the out of school clubs at the boundary of home and school. In their research they found that pupils overwhelmingly conceptualized the out of school club as a place for fun and play and stressed that the techniques used should also be fun. Interestingly, they were adamant that the methods

associated with schools; in particular those involving writing (including story writing and answering questions using a medium of questionnaire) should be avoided (In Rosalind Edward, 2002, p60).

At present students do not experience the kind of stimulating learning environment which makes learning an enjoyable, interesting and pleasurable experience in school and the schools themselves do not offer the potential to use ICT to optimum effect. In this study, pupils' attitudes towards using the computer and their reactions to learning from and working with computers in schools were examined in detail. Additionally attitudes concerning the availability and usage of home computers were also examined.

Evidence drawn from both qualitative and quantitative data presents a different pattern. On the whole this study has demonstrated predominantly negative attitudes towards using computers in a school environment and towards schools themselves.

Theoretical and practical experience of using computers

In this part of the research the theoretical and practical experience of using computers, both in school and at home will be addressed. Attitudinal questions were asked about learners' perceptions and experience, including the amount of time spent in using computers, the precise use and subject of that usage and whether or not the user has found the experience more pleasurable at home or in school.

In this part of the study his is indeed the crux to determine through qualitative and quantitative data to determine the differences in attitude and identify the relationship between the computer and the user in both a home and school environment.

The researchers wishes to identify if the computer is viewed as a valid instrument and if so is it perceived as a predominantly educational instrument or as an instrument that is transportable and compatible to other environments. From the interviews it is seen that students do express a difference in attitudes between home and computer. They appreciate the potential it offers for accessing information but value it as a home based apparatus where they can work more comfortably and explore differences between school directed and independent discoveries at home.

Pupils who have a computer at home report that they use it primarily for entertainment purposes (i.e. games) and although they also use it to prepare homework. For the most part these same pupils have a negative attitude towards using computers in school and find them neither useful nor important for study purposes. The first question concerns the use of computers at home.

Do you use computer at home?

<i>Categories</i>	Frequency Of the (310)	Percentage (%)
Yes	279	90.0%
No	31	10.0%
Total	310	100.0%

The results in the above table demonstrated that 90% of students, irrespective of gender, use a computer at home this is consistent with the results of the pilot study questionnaire which

confirmed that the majority of the children use a computer at home. Of the remaining 10% it is assumed that these children are those from a less fortunate socio-economic group, i.e. rather than choice.

Types of computers used at home

What type of computers do you use in school?

Types of computer	Home		School	
	Frequency Of the (310)	Percentage (%)	Frequency Of the (310)	Percentage (%)
	PC (Windows)	276	89.0%	251
Acom	1	0.3%	39	12.6%
Macintosh	2	0.6%	40	12.9%

This table demonstrates that 89% of home computers are accessible to study participants have PC windows, whilst this percentage drops when compared to 81% of those computers in school.

Is the computer you use at home compatible with the computer you use in the school?

Categories	Frequency Of the (310)	Percentage (%)
Yes	276	89.1%
No	34	10.9%

In most cases (i.e. 89.1%) the home computers are compatible with equipment in the student's school. This strongly suggests that the school equipment provided is not better equipped or further upgrade than that in the home. Schools simply do not possess enough up to date computer technology in order to deliver an enhanced learning service.

Helen L. Hollingworth and Susan Tyler Eastman (1997); observes that students have much more (and better) technology in their own homes than most teachers and administrators expect and significantly more than schools make available to students. They also note that a significant number of pupils not only possess a home computer but also a wide range of accessory technologies such as graphics software, scanners, fax machines and e-mail availability.

Such accessories have become more and more widely available to students in their own home although, alas, not in their classroom. In order to help students prepare adequately for the world beyond school, school budgets must provide similar accessory technologies to those found at home if they are to give both students and teachers valid experience using electronic technologies.

Time spent using home computers

How often do you use computer at home?

	Home	
	Frequency Of the (310)	Percentage (%)
Daily	205	66.1%
Weekly	57	18.4%
Monthly	17	5.5%
Not at all	31	10.0%

The above table demonstrates the comparison of time spent using home computers and those in school. Time factors play a significant role in learning in general and specific learning about computers. As shown in the previous chapter, students on average have access to a computer in school for only once a week. However the amount of time spent in using ICT

risers significantly amongst home users. 66.1% of students access their computers on a daily basis for a diverse range of activities as demonstrated later.

How many hours do use computer at home daily?

Categories	Home		School			Categories used in school
			On average how many hours per week?			
	Frequency Of the (153)	Percentage (%)	Frequency Of the (310)	Percentage (%)	Mean no. of hours per week.	
Up to 1 hour	16	5.3%	145	46.8%	1.93 ←	"1 hour"
Between 1 and 2 Hours	89	28.7%	96	31.0%		"2 hours"
Between 2 and 3 hours	103	33.2%	36	11.6%		"3 hours"
Between 3 and 4 hours	35	11.3%	11	3.5%		"4 hours"
Between 4 and 5 hours	11	3.5%	22	7.1%		"5 hours"
Between 5 and 6 hours	25	8.1%				

33.2% of students spend between 2 and 3 hours on their computers daily. Only 5.7% of the 16(310) reported that they use the computer for one hour. This still represents a great increase when compared to one hour per week in school. Some of these students (8.1%) even report using their computer for between 5 and 6 hours per day. However some allowances should be made for what usage home equipment is accessed for – some work may very well be school related.

Types of computers use in two different environments.

Do you use computer at home for?

Categories	Home		School	
	Frequency Of the (310)	Percentage (%)	Frequency Of the (310)	Percentage (%)
"Word processing"	186	60.0%	272	87.7%
"Spread Sheets"	59	19.0%	226	72.9%
"Internet"	270	87.1%	219	70.6%
"Drawing Pictures"	124	40.0%	114	36.8%
"Power Points"	63	20.3%	142	45.8%
"E-mail"	251	80.9%	109	35.2%
"Playing games"	259	83.5%	77	24.8%

The above table compares the type of use that computers are accessed for in different environments. In school we can see that the majority of pupils concentrate on word processing and spread sheet work, followed very closely by Internet activities whilst in school. Graphic representations (i.e. drawing or power point) are also popular with e-mail and game playing coming last on their list (probably due to difficulty of access with these subjects).

In contrast these same two activities feature highly on home users activities, being beaten to No 1 slot only by Internet. In the home users applications we see also Word processing and Spreadsheet work but their frequency is significantly less than school. It may well be that both fields have some connection with course assignments.

Type of games played in school and at home

Which games do you play in school?

Categories	Home		School		
	Frequency Of the (153)	Percentage (%)	Frequency Of the (157)	Percentage (%)	
'Educational Games'	67	21.6%	66	21.3%	
'Strategy games'	170	54.8%	51	16.5%	
'Action Games'	221	71.3%	46	14.8%	
Sports based games'	126	40.6%	34	11.0%	
'Role play'	85	27.4%	17	5.5%	

The researcher decided to probe further into the type of games played in school and compare the findings to those games of choice at home. Unsurprisingly the largest percentage of games played in school were those of a predominantly educational nature (21.3%). Role-playing games scored lowest at 5.5% which again may be due to lack of access to this

category. Additionally role-playing games usually require a significant investment in time and interest by the player- neither of which is usually conducive to the academic timetable.

At home Action games take first priority, followed closely by strategy games (71.3% and 54.8% respectively) with role playing coming last in favour in the home environment. This may well demonstrate an increasing development within both action and strategy games (i.e. “ instant fix” results and a more blatantly competitive approach). Students’ tastes may be more attracted to “shoot em up” rather than puzzle solving. However it should be considered that many students demonstrated a certain element of social isolation outside of school. Action and strategy games can be played alone, but role play inevitably requires partners to play against.

Use of computers more interesting at home than in the school environment

Is using a computer at home:

Categories					Categories used for school
	Home		School		
	Frequency Of the (153)	Percentage (%)	Frequency Of the (157)	Percentage (%)	
Very interesting	144	46.5%	13	4.2%	“Very Interesting”
Interesting	106	34.2%	16	5.2%	“Quite Interesting”
Neither interesting nor boring	24	7.7%	108	34.8%	“Interesting”
Boring	2	.6%	83	26.8%	“Slightly Interesting”
Very boring	3	1.0%	90	29.0%	“Not Interesting at all”

Here the divide between home and school use grows ever wide. 46.5% of home users found computing very interesting which demonstrates a significant variance with school users of whom only 4.2% agreed with this view. This is a staggering anomaly and demonstrates a vast chasm of disinterest in how ICT is incorporated into the education process. 29% of

school users rated ICT as boring, “not at all interesting” as compared to 1% of home users. The home users experience of ICT is evidently a very different one from the child who only encounters computers in a school setting. The researcher decided to probe more deeply and attempt to identify the reasons for such an anomaly.

The reasons of being computers more interesting at home than in the school

It is more interesting to use computer at home than in school because:

Categories	Home		School		Categories used for school
	Frequency Of the (310)	Percentage (%)	Frequency Of the (310)	Percentage (%)	
"I can work at my own pace"	203	65.5%	111	35.8%	"I can do my work"
"I can decide what to do"	178	57.4%	127	41.0%	"I can work fast"
"No time limit" at home.	178	57.4%	114	36.8%	"They give lot of information".
"I decide when to do the work".	139	44.8%	79	25.5%	"They give me different information than I can get elsewhere"
"I have access to more interesting material".	152	49.0%	37	11.95	"They make me think differently".

Autonomy clearly represents an important factor, with 65.5% of home users citing this opinion as apposed to 41% of the school users. Making one’s own decisions, setting one’s own deadlines and accessing more interesting materials all score highly in the home users responses. By contrast “they (computers) make my work look better” is the highest scoring category amongst school users (50.6%) with the next highest scoring response being “I can work fast” (41.0%). Based upon these results it could reasonably be deduced that home users are more reactive personae. However, as has been mentioned earlier in this chapter not all students have access to home equipment and this will influence their response.

Feelings about using computer at home

How do you feel about using computer at home?

Categories	Home		School		Categories used for school
	Frequency Of the (310)	Percentage (%)	Frequency Of the (310)	Percentage (%)	
Enjoy a lot	141	45.5%	38	12.3%	Very enjoyable
Enjoy	108	34.8%	133	42.9%	Enjoyable
Neither enjoy nor dislike	27	8.7%	98	31.6%	Neither enjoyable or un-enjoyable
Dislike	1	.3%	23	7.4%	Not enjoyable
Dislike a lot	2	.6%	18	5.8%	Not enjoyable at all

Unsurprisingly home users comprise the largest group of those who find using computers very enjoyable (45.5%) however 42.9% of school users find the experience although only 12.3% go so far as to describe the experience as very enjoyable. On the whole, research on educational home computing has been eclectic, following no particular trend. Over the past 20 years various researchers and practitioners have pointed at issues in computer use at home.

On the whole, research on educational home computing has been eclectic, following no particular trend. Over the past 15 years, various researchers and practitioners have pointed out issues in computers use at home (Caldell, 1986; Hunt, 1985) or potential connections between home and school computer use (Epstein, 1985; Schall and Skeele, 1995), but these discussions were only a sidebar to the larger research on educational technologies. (In Educational Technology Review (2002).

The researcher feels that this research is still in its infancy compared to other domains in which computers and learning have been studied. The equity implications of computing in

the home are particularly problematic. It can be argued that home computing already enhances socio-economic inequalities in access to education. Initiatives to provide home computers for children who do not already have them may help to balance the problem of unequal access. However, parents of higher socio-economic status are more likely to support their children's computing activities and more likely to have the technological skill to support those activities.

Difference between using computers in school and at home

Students perceived a significant difference in their approach to using computers within the constraints of a classroom environment and the competitive freedom of experience when exploring IT at home. The researcher then turned to the difference in experience between using the computers at school and using the students' own computer at home. Most students commented on the comparative freedoms afforded at home and compared this unfavorably with the necessary restrictions imposed in the classroom.

“...At home you are away from the stress of (the) teacher”...
(Boy year 9)

The choice of the word “stress” is an interesting one and, as we shall see, is a theme, which will be developed, in later interviews.

One boy expresses this difference in a succinct and telling manner.

“Em... a bit yeah! Because at school they are bit slow but at home you can go really on any website if your mum is not in the room. At home you can play games. So I do like to use computers at home”.
(Boy year 9)

This student is well aware of the limits placed upon his autonomy at home (“if your mum is not in room”) and also the possibility for transcending these limits. His tone of voice invites the researcher to collude with him and acknowledge that this is a reasonable and logical thing for him to do so. All children are by nature curious and the lure of the forbidden can be a heavy drug indeed. Perhaps recognising that he may have overstepped the boundaries of

self-protection he quickly adds that he uses the computer “to play games”. In either case, the possibilities that modern technology offers are definitely not for study purposes!

Another student is concerned with the “stress of teacher” and the domestic irritations which may be encountered at home. If one is not being overtly supervised by the tutor one can be just as easily distracted by the activities of one’s siblings. Both types of intrusion are stressful and equally unwelcome in their own way. Interestingly this student misses the personal interaction when communicating by electronic mail. “It’s not the same as talking about things”. Once again there is no mention of using the computer at home for study purposes.

“...Well they are both same really because at home you are away from the stress of teacher but in school you are with your friends and talking with them while you are working. At home you may be annoyed with your brother and sister and in school you can be annoyed with your teacher so they are both the same actually. But at home you can go on any website and in school they make you just go on certain websites and if you are at home you can go on like working websites and then afterwards you can go on miniclips for games. You can get lots of different games and its fun...”
(*Boy year 9*)

This student also finds IT studies stressful, both for the lack of autonomy and also the “distraction” of the teacher. As well as having his train of thought continually interrupted by his tutor he finds the experience “boring” and unstimulating. There is a clear conflict between the desires of the student and the aims of the schools. A bored student may quickly become a disruptive student if his needs are not acknowledged and sufficiently interesting activities employed to keep the student’s attention engaged.

Other students are more dismayed by the contrast of their school's equipment to their personal, and more up to date computers at home.

“...At school they (computers) are bit slow but at home you can go on really any website if your mum is not in the room”...
(*Boy year 9*)

From this we may deduce that the perception of unlimited access to the Internet at home is not a truly valid one. If students are not being supervised and monitored by their teacher in their classroom they are being monitored in a less obvious but still effective manner by their parents at home.

For some students however the presence of teaching staff is more irritating than stressful. For the following boy, teachers are an annoying presence who appear to serve little purpose except to interfere with the students enjoyment of games and electronic communication.

“...Its really boring in school.” (Boy year 9)

Just what the teachers are doing remains a mystery. Obviously staff are not just patrolling the classroom to spy on illicit activities but if some students are to be believed,

“... They don't learn you”... (Boy year 9)

In a typical response Boy Year 9 replied, “No, it's just boring. I am so happy that I am here because I don't like it (the lessons). Some times I like it if its very nice work, but if its' just writing stuff and you are not working with your friends it gets kind of boring. When you are working with your friends you can talk about all different kinds of stuff and every one else can give their own opinions which makes it more interesting. When

you are working with your friends its more enjoyable and when you are on your own you just get bored and don't do that much. Like in IT last year, we made a calendar which was very good. When you're just writing like just typing stuff all the time it gets kind of boring. That's it really".

"...They always tell you to do your work and even if you finish your work they don't let you (play games) and teachers (are) watching over you all the time..." *(Girl year 10)*

At home, one can enjoy more or less uninterrupted pleasure in playing games, sending e-mails and visiting new websites. In short the only limits are one's imagination and the restrictions placed on certain websites by one's parents.

"...In school we just do work typing things but at home I play on computer games and talk to my friends on the Internet". *(Boy year 9)*

Of course, one of the great advantages of using the computers at home is the unlimited amount of time available compared to the 50 or 30 minutes or so allotted in school. In addition to this one does not have to queue for the "best" machine or trade off a substantial amount of break time in exchange for additional electronic hours or minutes.

"In school you got to get some work done in about say 30 minutes. But at home you can do whatever you want to do. Like if you go on the Internet you can just keep on going through instead of going back to your work. You can keep on going whatever you are doing. Teachers do not distract you". *(Boy year 9)*

Again we hear the word "distract" applied to the teaching staff. This student clearly enjoys taking an idea and seeing it through to it's logical conclusion. He does not appreciate having

his focus interrupted by the teacher. It could well be that the focus of his interest does not coincide with the subject of the lesson. Many students have expressed the opinion that lessons are dull and repetitive, although as this opinion is invariably coupled with the idea for more games and freer access to the Internet one suspects that there is no great depth of impartiality being ventured here! So far in these interview little has been given detail of exactly what “work” is being done in the classroom. “Typing” and “writing” are often referred to but little else. The researcher is unclear as to the aim of these lessons. Some degree of competence is presumably desirable but as to how this is achieved and exactly what level of competency is being aimed for remains open to question.

It was decided to pass for further details to no avail. It can be seen from the following response that there is a very real and tangible difference between classroom and home activities.

“... I use my computer at home and most of the time I am on the Internet so I am always talking to people on chat sites and stuff like that. The difference is it’s a different atmosphere and you can relax at home. Sometimes you feel a bit tense in school”.

(Boy year 10)

Just why this student feels unable to relax in class remains unclear. Perhaps like many of his fellows his interests are straying too far from the work in hand and he is ever vigilant of the eagle eye of his teacher, waiting to pounce? Many students have expressed dislike or even apprehension of their IT tutor but whether or not this is associated with the person rather than the authority they represent is open to debate. Often students will transfer feelings of dislike surrounding a subject to the person who is delivering the lessons and may confuse personal

feelings with a general discomfort surrounding their ability to perform well in a subject they find tedious or difficult. It could well be that this is what we are observing here. This resentment continues into the following interviews.

“...Teachers are always watching you. You’re supposed to be working all the time in lessons really (student’s emphasis)...”
(Girl year 10)

Clearly what one is supposed to be doing is not necessarily what is actually being undertaken. The same student states that,

“...At home its easier and I got more time to use it”. *(Girl year 10)*

Time is an element that recurs again and again throughout these interviews, but time to do what exactly? One can be forgiven for suspecting that students are referring to time to play games. Few students taking part in these interviews take the long-term view and consider the implications that IT may have on their working life or their ability to find work. Surely there must be a way of combining learning with pleasure, of tailoring exercises to retain some of the game playing elements that are clearly the object of many students affection?

She can communicate with her friends, explore new sites of interest and take her own time to plan and enjoy these activities.

“...You get more freedom at home...in school you just have to do what you’ve been told to do”. *(Girl year 10)*

Another student expresses the same idea

“There is a lot more freedom at home. You can do what you really want to do. And you can stay on the computer as long as you want to at home. Its better at home.” *(Girl year 10)*

Throughout these interviews we have found that most of the students who disagree do so as follows,

“...We got rid of the computer because I don't like it”.

(Girl year 10)

Even in these interviews though we sense a lingering regret for the “good old days” as students go on to compare the restrictions of the classroom with the comparative freedoms of home and mentions game playing as a particular example of this. One of her friends has more forthright views.

The video project has been touched upon in previous interviews and not favorably so! This girl is no exception.

“...It's not even important...it's just boring, it's not interesting,
it's not fun...”

(Girl year 9)

She admits freely that the object of some of her IT lessons is a source of confusion to her. “I don't understand why we are doing this...this sound stupid.”

According to this student she is not alone in these views.

“...If they would give us some fun work to do people would be interested (and) then they would not be all messing about... No one likes (it) so we just sit and talk...”

(Girl year 9)

This student is clearly competent and enjoys using the Internet at home. As touched upon before it has been observed that a bored child can often become a “difficult” student. Feelings of frustration and restriction can be a dangerous cocktail to a student who is used to organizing her own IT activities and has clearly tried the routes on offer in the classroom previously and in more depth at home.

The same student states,

“...In school you are doing something totally different...”
(*Girl year 9*)

Unfortunately in this case “different” does not equate with “stimulating”. In fact the very reverse is true. We have touched upon the contrast in available school resources with home equipment before, and always to the school’s detriment. In few cases is the dividing gulf more apparent than here.

As well as the comparative sophistication of her equipment this student finds that

“...Its more private “...you can write whatever you like ...you haven't got teachers and people watching over you all the time.”
(*Girl year 9*)

Another student mentions

“My computer at home is like better than the ones at school. Mine is new...”
(*Girl year 9*)

There are some newer machines available at school but students have to arrive early in order to obtain one. As previous interviews have indicated, arriving early for lessons is not a priority for most students who prefer to use the trek to and from classrooms as an opportunity to socialize with their friends.

Another student is obviously proud of the freedoms offered at home and the inferred trust that his parents place in him. His tone of voice implies that a similar level of interest would be a welcome experience in school.

“At home its better because you can just learn more at home and at school they don't teach you”.
(*Boy year 9*)

Again the time constraints placed upon students and the frustration these invoke become evident. Once again the teacher is perceived as an unwelcome distraction rather than an imparter of knowledge. At home this student can work at his own pace and achieve his objectives in a manner that gives free rein to his imagination and accommodates his particular learning styles.

“Yeah! Like here you got like just one lesson a week and you got to get some work done in about say 30 minutes. But at home you can do whatever you want to do. Like if you go on the Internet you can just keep on going through instead of going back to your work. You can keep on going whatever you are doing. Teachers do not distract you”.

(Boy year 9)

As well as time, the repetitive nature of IT studies holds little interest for these students. These students recognise that keyboard skills can certainly ease the pressure of homework assignments but showed a marked preference for sandwiching the “necessary evil” between other, more pleasurable activities. They are happy to spend more time on their activities if they can incorporate small “rewards” into the process. These students have the ability to organise their time effectively and optimise the resources available to them. This choice does not appear to be on offer in the classroom and this particular learning style is not encouraged.

“Well! In school we just do work typing things but at home I play on computer games and talk to my friends on the Internet”.

(Boy year 9)

The majority of the students view their home computer as a valid and enjoyable source of relaxation and reaction. They enjoy the exchange of information and day-to-day communication with their friends, relishing the speed and “instant feedback” that such exchanges can offer. There is considerably more “freedom” to do as one wishes, and this is

contrasted unfavorably with the constrictions of the classroom. Classroom activities are defined as something “totally different” from the experience of using the computer at home.

Natural curiosity is also being overlooked in the constant drive to achieve required competency levels. To do what exactly? The following student is more forthcoming. From her response we can see that her natural curiosity is being catered for in her relentless search for new ideas.

“If I am not doing my homework I like to go onto the Internet looking at like new music websites and things like that you know and finding out funny things. I can e-mail my friends. It's a kind of faster really than writing a letter because when you write a letter and send it, it takes time. And if you are e-mailing your friends you can communicate better”.

(Girl year 10)

One student is especially articulate in expressing her frustration with the system. She sees little point in “video learning” and truly doesn't understand why this activity is being undertaken at all. “It's not even important” in her scheme of things. It holds no interest for her whatsoever, neither stimulates or educates her in any perceivable manner and “it's not fun”. Once more we return to the recurrent theme of boredom and disinterest in what should ideally be an enjoyable experience. The researcher is presented with a lucid picture of bored students “messaging about” and withdrawing both their interest and support.

“Yeah! Because if I was at home I would like go on to the Internet and look at some sites, do what I wanna do. But in school you are doing something totally different. And sometimes I feel like that we do some stuff but I don't understand why we are doing this. Its not even important. Most of the things we do in school its just boring, its not interesting, its not fun. That's make people not want to work in IT.

(Girl year 10)

Students are aware of the possibilities the Internet can offer and resentful at its lack of availability within school.

“...At school we are not really allowed to use them in school”.
(Girl year 10)

“At home you free to do what you want. You're free to go on any like erm web pages. Like you can play games and stuff. At school you can't do that I can use the Internet when I want to and how I want to as well”.
(Girl year 10)

However there are other, less positive views regarding the use of computers at home. One student is quite definite- “I don't like it”. When invited by the interviewer to expand on her opinion she moderates it slightly. She acknowledges the freedom of choice available to her at home and contrasts this sharply with her experiences at school. She is patently unhappy with and resentful of the teaching process-... “even if you finish your work they don't let you” (play games).

“I have a computer at home but I don't use it. Yum...used to but we got rid of the computer because I don't like it. But at home you can do whatever you want. You can play games and stuff like that. And in school they don't let you. They always tell you to do your work and even if you finish your work they don't let you”.
(Girl year 10)

Some students are fortunate enough to have access to more than one home computer. One student equates multiple access with multiple freedom of opportunity. Put simply, “it's better”.

“...I got two computers at home. And there is a lot more freedom at home. You can do what you really want to do. And you can stay

on the computer as long as you want to at home. I think better at home".
(Girl year 10)

Another student exhorts the benefits of communicating with friends and accessing information from the Internet. Again, school activities are seen as "boring" and un-enjoyable.

"... At home you can go and get on the computer whenever you want. You can also play games, you can talk to your friends or just surf the web. But in school, you can only use it for work which is sometimes really boring I like using it at home". *(Girl year 10)*

Many student use the computer to communicate with their friends, enjoying the privacy and the freedom of the expression that electronic mail can offer. They enjoy exchanging information on chat sites and gaining new ideas from persons outside their immediate social circle. One girl comments that she feels more able to relax. She admits to feeling "tense" in school – an undesirable emotion for one so young. Whether this is due to academic or social pressure is unclear.

"Em...em...the difference is it's different atmosphere and you can relax at home. Sometimes you feel bit tense in school. But at home its quicker and you can do whatever you want to do".
(Girl year 10)

Both issues of privacy and personal autonomy feature strongly with these students. At home "you don't get into trouble" for exploring beyond the usual boundaries. You can access your e-mail and express yourself freely without feeling constantly observed-and judged!

"...You get longer at home. You don't get into trouble for going on something you are not supposed to. You can play games or listen to music, you can check your e-mails at home which you don't do in school".
(Girl year 10)

Only one student feels that her freedom is limited at home. Even so she acknowledges that her parents do allow her access for homework assignments even though they prefer her to make the most of her opportunities in school.

“Well I got a computer at home but my mum and dad feel that I should use computers in school as best as I can. But they do let me use it at home if I’ve got to do my homework”.

(Girl year 10)

One student appreciates the difference between standards of equipment in school and at home. Access problems at break and dinnertime are frustrating. There are limited machines with Internet access and these are fiercely competed for.

“My computer at home is like better than the ones at school. Mine is new. Erm... at school you can mainly look at things to do with work. I use them at break and dinnertime. It's hard to get one because everyone wants a computer to work on. You have to get there early to get one. They are good because there are like new programmes on them and you can use the Internet”. *(Girl year 10)*

Even students who frequently use the computer at home feel strongly that one IT lesson a week is not sufficient to fulfill their needs. All in all, students feel constricted by the limits of time and autonomy placed upon them, regardless of ability and do not feel inspired to take the opportunities available to them seriously or enthusiastically.

“... I got a computer at home but I go on the Internet and use it to talk to my friends and sometimes for homework. Em...at home its different because you can do whatever you want to do. In school its like restricted to what you can go on and things like that. Ah...I think we should have more than one lesson a week. Like two”.

(Girl year 10)

Conclusion

Previous and present research, the quantitative and qualitative evidence gathered in this study unequivocally show that the use of computers in a school context does not in itself transform our educational system. Pupils are still reluctant to learn about computers in school and the use of computers in schools is not impacting on student attitudes and behaviour in a positive manner. We can no longer treat the presence or absence of computers in children's homes and schools as a luxury. Consequently the design and implementation of any future educational technologies will have to take into account the home factor in one way or another unless we address inequalities of involvement with computing educational.

Educational and social inequality may increase if less affluent children of lesser educational ability use inferior computers at school (i.e. fewer, older slower, non-networked etc) or if their teachers are not trained in the use of, computer. Similarly if the school's curriculum makes less effective or less advanced use of information technologies than another school. (Attewell 2001, Becker 1999, Henry1999).

Debate between technology, enthusiasts and technology detractors has been heavily speculative; discussing what may or will happen rather than documenting children's actual experiences and perceptions of ICT. (Subrahmanyam et al (2000, p139).

ICT can improve the learning process, but without trained staff, students involvement and the appropriate technology resources it lack either the budget or the acknowledgement to do so.

All in all it can be observed that school has many obstacles to overcome before it can capture student's interest and commitment. The ongoing war of attrition between school and available budget ensures that school equipment will always be unfavorably compared to that at home. It is impossible to upgrade equipment with the frequency and financial/credit advantages of the home user. The majority of students appear to be repeating exercise they have already mastered at home and the subject and delivery styles of IT lessons are not presented in a format that invites their interest. Unless there is a really radical shake up in both the teaching and the learning of IT in school, this situation is unlikely to be resolved in the school's favour.

The researcher through the qualitative approach found different attitudes of pupils towards the home and school. Children interviewed explained that if their mums and dads are not at home during the day how can they help them in the learning process? They (the children) just sit and watch TV (mostly Kilroy) listen to music or play games on computers. They cannot talk to their friends on e-mail because they all are in school; therefore it's preferable to come to school, even though they don't learn what they want to learn all the time. However they can see their friends, make new friends, chat, "doss" and "chill out" in school with their friends. They can socialise with their friends which is something they cannot do in the chat room. When they see each other they get a chance to know more about each other, arrange times to go out, (i.e. go to the cinema or shopping). In practice they don't think that schools are for learning although they do come to learn. School is the place where they get the best chance to socialise with each other.