

2 Methodologies, concepts and framing perspectives

Introduction

The use of computers by young people has been subject to many research perspectives. A considerable body of this research has focused on the ways in which computers could enhance or transform learning and schooling (Papert, 1980; Clements and Gullo, 1984; Watson, 1987; Schostak, 1988; The InTER Programme, 1988-93; Underwood and Underwood, 1990; Somekh and Davis, 1991, 1997; Dwyer, 1994; Cox, 1997). Other research has focused on the ways in which computers are used (Winograd and Flores, 1988; Schank et al., Institute for the Learning Sciences research programmes; Shneiderman et al., Human-Computer Interaction Laboratory). At the same time there has been concern about the impact of computer use on young people (Turkle, 1995; Levinson, 1997; Sanger et al., 1997; Griffith et al., 1999). The use of information and communications technologies within schools has become a political issue (Blair, 1998; OFSTED 1998). The ways in which the effects of computers on young people have been studied have many parallels with attitudes towards the effects of television on the young. The subject, therefore, is complex and requires a multi-layered analysis.

This study has been informed by a number of perspectives, rather than being grounded in one particular methodology. They form part of my own theoretical framework and have enabled me to interrogate the data from more than one viewpoint. They throw spotlights on the data, which was collected over a five-year period and subject to many different types of analysis. Some of these theoretical perspectives have shaped my praxis for most of my professional life: the centrality of language in the ways in which young people construct their own learning; the importance of tools to augment intellectual processes; the belief that young people can articulate their reasons for working and learning. Others have been explored during the course of the study. None of them, however, forms the underpinning theory upon which the study is based. Instead this is more a matter of the refinement of the concepts that have been with me and emerge from the

12 *Virtual Learning*

difficulty of taking understanding further by the application of existing methodologies.

The research methodology

The research was designed to generate information about three areas: the level of ownership and use of computers across the school population; young people's reasons for using computers; and young people's understanding of computers and their capabilities. The initial vehicle for data collection was a response sheet which students were invited to complete. It contained two tables, one headed 'Home', the other, 'School'. Each table contained three sections: at the top of each was a prompt. I use computers for... ; because... ; type. The first assumption was that quantitative data would be collected, although the approach was different from those who try to isolate every possible variable. The openness of the response sheet was such that there were a number of unexpected results (see Appendix 2 and Appendix 4).

I wanted to provide a format which would allow as wide a range of responses as possible within these three areas. The first survey generated a rich collection of data: most students provided a commentary on the information they entered. This serendipitous conjunction of quantitative and qualitative data was unexpected. As a result, the format was retained for all the subsequent surveys.

Data collation and analysis

Collating and analysing the data initially posed problems of organisation. Before the first survey was carried out a considerable amount of time had been spent with colleagues discussing options. These centred on questions which students should be required to ask, the ways in which these could be analysed and the uses to which they would be put. The consensus was that a structured data collection sheet should be used which provided students with a series of options to choose. This would have enabled data to be analysed much more easily.

Despite the ease of collation and analysis, however, the format would have limited personal or idiosyncratic responses. This approach was not used: previous research I had carried out into young peoples uses of television suggested that the most productive responses were those which I would never

have included in a structured questionnaire. The format of open responses was used: it would provide essential quantitative data and allow its qualitative analysis.

The data generated from the first two prompts was useful, instructive and consistent. They provided quantitative data related to each tutor group and each year group, broken down by gender. This data could be expressed in percentage terms, providing a picture of ownership across each cohort. The approach was retained in subsequent surveys: it provided a clear, sharp focus; there was nothing to hide, it was easy to report.

The quantitative data relating to the level of ownership changed over time. The longitudinal nature of the study meant that presentation of the data in percentage terms provided a clear picture of this change. The data was also used by year teams and curriculum managers across the school to inform their decisions, and its presentation as percentages enabled comparisons to be made both across, and between, year groups.

Data from the 'because' section was analysed in terms of item frequency, collated and grouped. Again, it was expressed in terms of percentages for each response and each cohort. The findings were detailed and consistent. Students went to great lengths to explain how and why they used computers.

Other data collections invited students to write letters or provide explanations. The ability to extract qualitative data from what was ostensibly a quantitative survey, in that students proved willing to offer a great deal of information, provided extremely rich content. This too could be presented in a range of ways.

The only personal information students were asked to provide on the response sheet was their year group and gender. Despite this, a number of students provided their names and indicated that they would be interested in following up the survey. They were more than willing to volunteer the information. They had clearly reflected on the ways in which they used computers, and the part the machines played in their lives, and wished to express their interest. This contrasts with the assumptions in some research that students would be reluctant witnesses, and that a structured survey sheet requiring minimal input from young people is the most effective method of collecting data.

This personal and unsolicited response from students enabled the content to be validated through random conversations – a form of convenience sampling. These conversations took place in their tutor rooms, when students were using IT facilities (particularly during lunch times), and when moving through the school outside lessons. The most valuable of these conversations occurred when

14 *Virtual Learning*

students would approach me and initiate discussion about using computers, knowing that I was conducting research.

In a very few cases a response sheet was suspect or highly ambiguous, and was therefore counted as a zero response. Examples of these occurred when 'I don't know' was entered for gender, or 'Sex' was entered after the 'I use computers for ...' prompt. These examples were, however, extremely rare.

During the six-year survey student coursework was also analysed to establish the ways in which it was produced using ICT, and teachers were asked to comment on the effects of ICT on work and marks.

Media and audiences

During the course of this research, a number of concerns emerged in the media about the use of computers and their effects on young people. These ranged from the moral panic over access to computer pornography, through VDU-induced epilepsy and the perils of Repetitive Strain Injury to the activities of teenaged hackers. As access to the Internet increased, so did journalistic worries over the apparent availability online of anarchist handbooks, pre-written essays and dissertations and, most of all, pornography. All of these worries mirrored the theme of Media Effects, predicated on the question of what use of the media did to its audience. In the case of computers and young people two concerns have become conflated: the first, that the unlimited use of computers will affect the young people who use them; the second, that the apparent availability of 'unsuitable' material available at the click of a mouse will cause young people to seek it out.

Uses and gratifications theory

A contrast to the assumptions of 'Media Effects' theory is that of 'Uses and Gratifications'. A Uses and Gratifications approach is posited on the assumption that an audience consists of active individuals who do things with the media – they are autonomous consumers (McQuail, 1987). These uses are held to gratify the needs of the individuals. The approach is, from one perspective, democratic, in that it gives a voice to the people who use the media. There are, however, a number of reservations about the methodology (Severin and Tankard, 1997).

These are based on the assumption that 'ordinary' individuals are not aware of their real reasons for making media choices: the data has to be explicated by researchers. In this study, however, we found that students were able to articulate their reasons for using ICT, both on the survey response forms, in letters they wrote advising on the purchase of computers, and on the ways in which they thought that they learned.

Caution has to be exercised when implementing a 'Uses and Gratifications' analysis. The validity of this approach is dependent upon respondents giving an accurate account of their reasons for using media. Uses and Gratifications theory is also individualistic, in contrast with earlier positivist instrumental approaches. The social and economic context of media production (and use) is often ignored by both researchers and respondents. This is particularly apposite when the media under investigation is that of computers. Another limitation is that the ways in which meanings are constructed through media use, and the ways in which these frame later responses, do not lend themselves to an investigation of this type. The reality is that the rapid development of technology and its instability, together with the increasing patterns of ownership, have meant that young people have been anything other than passive consumers.

The final criticism of a Uses and Gratifications approach that collects responses is that it is essentially consumerist and non-theoretical, vague in key concepts, and nothing more than a data-collecting strategy (Severin and Tankard, 1997). All that respondents are providing is a list of preferences: all that researchers are doing is accepting those preferences and providing a set of league tables. What we have here in this research is more subtle: we are making no assumptions.

These reservations may be held to have some validity if respondents are considered as no other than passive consumers of media. However, the advent of interactive computer media (programs, multimedia and the Internet) means that individuals adopt a far more proactive attitude towards what, when and why they will use it. We cannot hold on to simplistic stimulus-response models.

Despite these reservations the Uses and Gratifications approach provided an appropriate framework within which to organise the data collected in response to 'because...'. The categories of Surveillance, Personal Identity, Personal Relationships and Diversion were transferred from media use to computer use very easily, with student responses often including a number of categories according to context. The audience survey provided valuable data which formed the basis for the research into the effects of computer use. A more complex

16 *Virtual Learning*

analysis of the relationship between young people and Information and Communications Technology was then possible. Information and Communications Technology can be regarded as a medium: this analogy is borne out in the responses of the students.

This ease of use was not without problems, however. One of the Gratifications identified by McQuail was the sub-set Personal Identity. This provided the largest set of responses, with students identifying computer use and computer knowledge as an integral part of their identity. They saw the use and knowledge of computers as providing access to the 'real' adult work, and the skills and concepts which they were acquiring as providing them with an advantage over those who did not possess them. At the same time, the ability to navigate the complexities of computer games gave status within their peer group. The question arose as to whether this constituted a legitimate sub-set, or whether it was simply a convenient catch-all. One response to such heavy weighting of Personal Identity would be to discount it as too broad and general a category. However, it was decided that this should be retained, because it represented an important strand to the way in which students regarded computers, and the way in which they positioned themselves in relation to their development and their world.

The use of this approach to the data enabled me to identify the ways in which students thought about, and used, their computers. It provided a perspective that enabled additional areas to be explored during the next four years.

The researcher as observer and participant

Throughout the survey, I attempted to provide students with ways in which they could explain their actions and motivations in their own words. This process often involved a level of practical reasoning that enabled them to explain that which they would otherwise take for granted. The research was concerned with identifying the individual experiences of, and interactions with, computers by the students, and the ways in which they conceptualised these. Above all, I have been concerned with the context of their computer use.

At the same time as I was collecting data from the students I was also extending my own use and understanding of computers, a process which often informed my interpretation of student data. I was both a participant and an observer: a participant in learning about the extent and implications of computer

use, both by myself and with students. I was also a participant in the student learning that took place. I was therefore both participant and observer in the 'way of life' of the students with their computers, as well as their activities and the educational contexts. What I was concerned with was the ways in which young people made sense of the computer technology they used, and the ways in which they incorporated it into and managed their lives. This approach could be seen as drawing on ethnographic traditions of research. It was the integration of computers into their own lives that became increasingly important as the research progressed. The starting point had been simply how the students approached computers, at home and at school. This emphasis shifted to why students handled computers in the ways in which they did.

Symbols

The Graphical User Interface that has become the de facto standard provides students with icons and symbols through which to work. My approach to their uses of this computer interface, and the ways in which students construct documents for their coursework and websites, is informed by my readings of semiotics. This 'science of signs', in which communication, through the signifier (the sign), results in what is signified (the message) has had a long influence from Saussure (1915) onwards. The advertising that surrounds these young people provides a constant lesson in this to them.

Semiotic ideas have since permeated much of the way we ground ourselves in (post)modern life: our reading of television advertisements, magazine photographs and modern buildings is predicated on signs and messages. Work as diverse as those of Barthes (1957; 1982; 1987), Eco (1976; 1986) and Hodge and Tripp (1986) have informed the readings of student work in these surveys. Work undertaken with students has also indicated ways in which young people read and deconstruct the media: from Cullingford (1984) on children and television; through Buckingham (1996) on children's emotional responses to television; to Robinson (1997) on the ways in which children read both print and television. Young people are sophisticated media consumers. This sophistication is transferred to the medium of computers, through which they can apply creativity.

The layout of a computer desktop is a perfect example of interactive semiotics: the icons signify not only their function, but what can be achieved through them. All the transactions the user wishes to undertake can be conducted

18 *Virtual Learning*

at a virtual level. New icons can be created for the desktop which will generate further messages: the computer will carry them out.

Cyborgs

As man-machine artefacts, cyborgs embrace our concepts of humanity and artificiality, intelligence and programming, thought and instructions, gender and androgyny. The development of medical technology has introduced a cyborg element into people wearing contact lenses or pacemakers; biotechnology and genetic modification brings awareness of our hold over the creation of life. Hollywood uses cyborgs in its depiction of dystopian warnings of technologies out of control and societies in decline. Perhaps the most productive intellectual use of the cyborg metaphor is the way it has been used as a tool to interrogate questions of gender and social identity in our network of social relationships, from labour and economics, through biotechnologies to ethics. (Haraway, 1985). Here, the cyborg has the possibility of a hybrid being, not subject to the constraints of social, political and gendered identity.

The cyborg perspective provides a productive focus for interrogating society. Web sites such as The CyberStudies Resources Site (<http://ccwf.cc.utexas.edu/~glik/index.html>) provide access to a constantly mutating set of memes.

The way in which students in these surveys have used the concept is influenced by media drawing on a range of science fiction: Terminator; RoboCop; Blade Runner, and is very often tongue-in-cheek. However, they do visualise computers as enhancing their own capability. This is more than a fashionable trope: it frames all of their perceptions about the ways in which the technology has become embedded in their lives. Technology can be seen both in Nature and as Nature.

My reading of the term, and the way in which it has been applied throughout this study, is its original one: a man-machine interface which performs automatic routine checks and monitoring, enabling the human to create, think, feel and explore. (Clynes and Kline, 1960) The relationship between the young person and the technology used is iterative: feedback from the program, the machine and online sources sets her free from the mundane to create artefacts that would otherwise not be possible. Chapter 6 explores these themes.

Building things: the DIY approach

Levi Strauss (1962; 1996) uses the term 'bricolage' to identify a science of the concrete in which structures are improvised to devise a system of meaning from given material. Levi Strauss draws on elements of semiotics in his analysis of the ways in which structures of meaning are constructed from 'what is at hand'. The concept is applied here to the ways in which young people create their own artefacts and systems of understanding from materials which they find to hand on, and through, their computers.

Computers as the means of production

The term 'capital' is used in this study in two ways. The first is in the sense of real capital, having a money value and constituting a productive asset. This relates to the computers, associated hardware and software to which the students have access at home. The second is that developed by Bourdieu (1986; 1993) of cultural capital and symbolic power which, through the education system, reproduced social and class relations. The symbols, language and culture of the dominant group constitute a hegemony of social characteristics which serve to differentiate the groups: the education system reinforces that differentiation. Cultural capital is often represented by cultural goods, artefacts that signify membership of the dominant group. The acquisition, understanding and use of computers constituted an important aspect of cultural capital for the young people during the five years of the study.

Hegemony

I have used the term Hegemony to describe the way in which a set of practices and assumptions come to dominate the praxis and thinking of a group. In this sense it is not a 'world view' in the Gramscian framing, (unless one applies it to the current dominance of Microsoft's operating systems and software and Intel's processors) but rather a set of assumptions shared by students and staff in our school. These assumptions are regarded as 'common-sense' and taken for granted.

20 *Virtual Learning*

The assumptions about computers that constitute such a hegemony have been imposed by students: in this sense, they represent the 'dominant class', and their teachers have come to accept them as 'common sense'. The first assumption is that personal computers are synonymous with Intel-based PCs running Microsoft programs. The second is the assumption that assignments set for examination coursework should be word-processed, include tables, charts and other graphics and be set out in business-style report formats. The final assumption is the trickle-down effect for students in Years 7 through 9 that, for work to be classed as 'good' that it too should be presented in the same way as that of Years 10 and 11.

Computers, then, represent the site of struggle between many students and teachers in the school. The imbalance between student ownership and that of teachers, and the differing skill levels of each group, has enabled students to hold the dominant position and determine much of the discourse. (See Chapter 5; Appendix 1; Appendix 2.)

