4 Research into patterns of computer use: surveys, 1994-1999

The school context

The comprehensive school at which I worked in West Yorkshire served the communities to the north east of Leeds. It was attended by some 1800 students, was non-selective and offered access and progression to the full ability range from Year 7 to Year 13.

The research context

From the outset of the Computers in Schools initiative in 1983/84 the school had developed an IT policy based on a number of stand-alone machines. By 1987 a classroom had been networked with Acorn Master 128 computers. During the following year the networking was extended to cover further classrooms, with older machines used as printer and teletext servers. Students throughout the school had access to the network during lunch times for their own work. When the Acorn Archimedes computer was introduced additional facilities were provided on a departmental basis. For a long time, therefore, the students had been familiar with a networked computer environment.

In 1990 four teaching staff established a school-based training company to develop new learning technologies. This initiative was funded by the Department of Trade and Industry, and resulted in a body of expertise being developed in the production and applications of Hypertext, CD-ROM and online information retrieval.

Developments in GCSE Business and Information Studies, and vocational courses such as BTec and GNVQ, demanded a range of software applications (often referred to as 'business standard') that offered the students transferable

skills. It was decided that the school should provide a mixed economy for the students: a Novell network (funded by the training company) supporting IBM-compatible PCs was installed, whilst Archimedes machines were used where appropriate. As the Acorn Master machines reached the end of their economic life they were replaced by networked PCs.

The result was a whole-school PC network covering each department, equipped with fifteen PCs, appropriate printers and with access to a scanner; clusters of PCs in the library work area, a careers-specific network linked to a printer, and clusters of PCs, linked to a printer, in the Sixth Form Common Room. There was open student access to computer facilities and the Internet outside lesson time. Students also used video-conferencing facilities within parts of the curriculum.

Networked PCs with Internet access were also available for staff use in offices and work areas. Individual departments also used (old) stand-alone PCs as teaching and learning aids. The school administrative system ran on a separate network utilising software common to the LEA (SIMS: Schools Information Management System), with terminals installed in each year office.

The school curriculum policy was for information technology to be regarded as cross-curricular, rather than as Information Technology, a specifically timetabled subject.

The research problem

The school had made a significant investment in information technology over a period of ten years, with some staff committed to innovative uses. The school and its company had won a number of awards to develop innovative learning technologies. By many indicators, both in the extent of ICT technology to which students had access, and the projects in which a significant number of staff were engaged, the school could be considered to be more IT literate than many others. One would expect there to be an appropriate curricular impact on classroom activities and teaching and learning styles.

The reality of the learning experience of information technology across Key Stages 3 and 4 was, however, at best patchy; at worst deficient. National Curriculum requirements did not appear to be met if the measure was work undertaken within school. Work produced by those students who had a

computer at home, on the other hand, suggested there was expertise and a depth of experience which was not recognised within the school.

There appeared to be a growing disjunction between National Curriculum expectations, cross-curricular experience and students' personal computer use. It was possible to determine, from the allocation of teachers on a student's timetable, the likelihood of that student receiving the information technology input deemed appropriate by the National Curriculum. Despite this, students produced computer-based work in order to meet assignment requirements, in many cases despite, rather than because of, their teachers' instructions. They appeared to have access to a capital base at home, and to possess and use skills which they had not been taught at school.

At the same time, anecdotal evidence from teachers in department and year meetings during the academic year 1994-95 suggested that many students preferred to work on their computers at home, rather than those at school. They reported that such students were using this as a reason not to engage in work during classes, and cited it as a negative impact of computers on the school process.

No objective evidence existed, however, for the extent to, or ways in which, computers were used. It was decided to survey both students and staff to determine the uses to which computers were put, identify patterns and suggest ways in which curricular outcomes could be improved. The survey was repeated during the academic years 1995-96, 1996-97 and 1998-99.

Methodology

In the spring term of 1995 the first survey of home computer ownership and use among the students was undertaken. Students in every tutor group were asked to indicate their access to, and use of, computers at home and school. The response sheets contained spaces for students to comment in detail, should they wish. 1331 students responded: some 74% of the total school population. The shortfall reflects student absence, the pressure of activities during morning tutor time and the priority placed on the exercise by the form tutor.

The initial survey was followed by a more detailed investigation of responses from Years 9, 10 and 12, in which students were asked to comment on the extent to which they thought it worth having a computer at home for work. Detailed

student responses formed the basis for interviews. Comments from students are used to illustrate points throughout this section.

The ownership and uses survey was repeated during the spring term of 1996, 1997 and 1999. Sample sizes ranged from 1256 to 1380. The size and extent of the samples, therefore, suggest that conclusions drawn from the data can be considered valid. The spring term was chosen to include those students who received a computer as a present for Christmas.

1995 Findings

The first survey showed the following pattern:

Table 4.1: Students with a computer at home: the uses to which it is put (1995)

Total number of respondents in the survey		Number of respondents with a computer at home	
Gender	Number	Work and games	Games only
Male	674	418 (62%)	229 (34%)
Female	657	355 (54%)	170 (26%)
Total	1331	773 (58%)	399 (30%)

58% of all respondents (773 students) either owned a computer, or had access to one at home.

58% of the students (773) who completed the sample stated that they had a computer at home that they used for work.

35% of the students (466) stated that they had access to a PC with a Windows operating system.

In some cases responses cited specific software applications: Microsoft Works (the integrated package used across the school PC platform); Microsoft Office and its components, or Lotus SmartSuite and its components. The significance of this is that in Spring 1995 more than 30% of students had access

to the same technology as used in the business world. These students utilized the same programs. They used the same exemplars - grounded in the context of American business - for document production. None of the programs cited by students had been produced for the education market, other than those for Acorn computers.

The ways in which students classified their hardware produced a spectrum of age and utility which correlated very closely with uses. For IBM-compatible PC users, older students referred to their machines in more technical terms - 286; 386; 486-SX or -DX - than younger students, who simply cited PC, or Acorn. In Years 7-9 students would state that they used their computers for writing, drawing or graphs, whereas in Years 10-13 the software would be stated - Works ('...for everything...': Year 11 girl); AmiPro or Excel - and the uses related to specific coursework assignments. The implication of these statements was that the students making them had a sophisticated understanding of their computers and software applications.

The perspective of students at the school was that Acorn Archimedes computers were promoted as the standard machine for education. The policy of the local education authority, for instance, had been to develop IT programmes and expertise around this standard, and its funding and supply policies have reflected that. The Educational Information Technology Centre provided in-service courses based on Acorn computers for teachers. Despite this, students who were Archimedes owners and users constituted only 3% of the school total, and of the BBC Acorn a mere 0.4%. It was clear from these figures that the acquisition of a computer for home use was hardly influenced by the machines in use at school. This compared with Macintosh ownership of 1% and Amstrad PCW use of 4%, neither of which machines were used in the school.

Student ownership and use of the Commodore Amiga, on the other hand, was 15%. In 1995 the Amiga constituted the most problematic machine for student use. The marketing and advertising for the computer was targeted at the games market, but the added value was perceived to be the software bundles that enabled 'real' work to be done. Advertising for the Commodore Amiga was consumer oriented: computer games magazines were the primary information source for many young people, although outlets such as Dixons and Currys featured the machines in their catalogues. Of possibly more significance, however, was their supply through Argos and mail order catalogues.

The focus on work-related software had proved to be an important strategy when students were negotiating their purchase with parents. All Amiga users

cited 'assignments' or 'work for school' as one of their uses. A number, however, added that there were compatibility problems with file transfer or printing between home and school. The games capacity of these machines had been their greatest attraction. The additional effort involved in using the machines productively proved too great for many. Students from Year 11 onwards volunteered that they would have been better advised to purchase a PC.

1996 findings

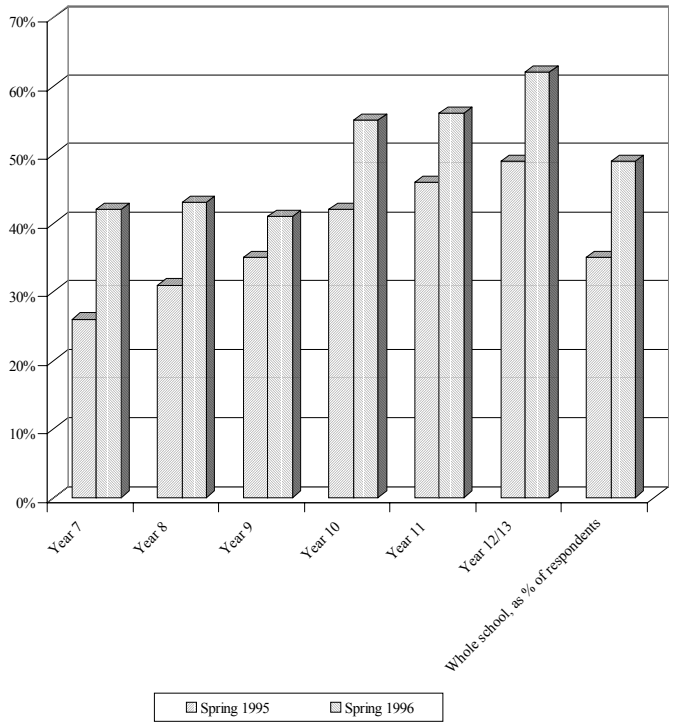
The survey was repeated a year later, in Spring 1996, to determine whether any trends could be identified. The results were compared with those of Spring 1995, with a specific focus on Intel/Windows-based machines. They showed a significant shift in home ownership of PCs.

Table 4.2: Home ownership of Personal Computers (IBM compatible), 1995-96

Year Group	Spring 1995	Spring 1996
Year 7	26%	42%
Year 8	31%	43%
Year 9	35%	41%
Year 10	42%	55%
Year 11	46%	56%
Year 12/13	49%	62%
Whole school, as % of respondents	35%	49%

Figure 4.1 maps these changes.

Figure 4.1: Home ownership of Personal Computers, 1995-6

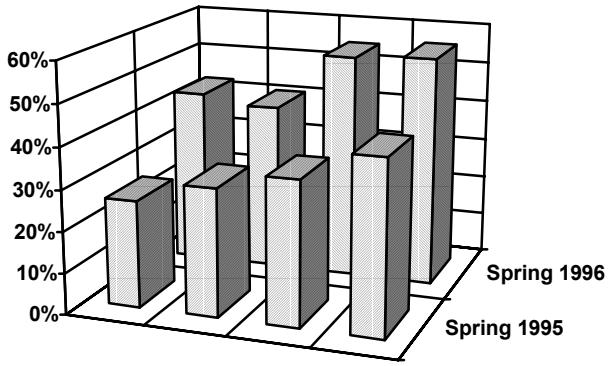


The significance of the shift can be seen when the growth in ownership across each student cohort of Key Stage 3 and 4 is examined.

Table 4.3: Increase in ownership across student cohort

	Spring 1995		Spring 1996	
(Year 7)	26%	⇒	43%	(Year 8)
(Year 8)	31%	⇒	41%	(Year 9)
(Year 9)	35%	⇒	55%	(Year 10)
(Year 10)	42%	⇒	56%	(Year 11)

Figure 4.2: Increase in ownership over one year



As this growth in ownership of machines continues, then there is a corresponding growth in the concept of ownership of work. The site of production for many students has been relocated from school, (which is associated with limited access to facilities - time and resources - and, above all, teacher direction) to home.

Research comparisons 1996-97

During the academic year 1996-97 the survey was undertaken in a city school in the local education authority. The school was chosen to provide additional data. It is an inner city school and the student population could be considered less economically privileged than those at our school. Many of the students are drawn from ethnic minority groups. Our school, on the other hand, has a catchment area more representative of the overall population, taking in commuter villages and housing estates to the north-east of the city.

Methodology

The student survey utilised the same open response format of previous surveys, following the prompts:

I use computers for… because… Computer type.

Student surveys

Students at both schools were surveyed during the tutor period at the beginning of school. Those at the City Comprehensive School were surveyed during the first week of December, 1996. Data was obtained from 283 students: 43% of the school enrolment (658). Students at Boston Spa Comprehensive School were surveyed during January 1997. Data was obtained from 1380 students: 77% of the school enrolment (1787). The disparity between the number of students surveyed and the number on roll was due to absence, lateness or other activities that removed them from their group during tutor time. The scope of the survey, however, suggests that the data represented the upper and lower levels of computer ownership during this period. City School was surveyed before Christmas; our school after: this in itself would heighten the differences between the data.

The results in the following tables are only for home ownership of personal computers. There were limited responses from students from both schools for Acorn, Amiga, Atari BBC, and Mac computers used at home for work, and a greater number of responses for computers such as Nintendo, SEGA and Sony that were only used for games. The focus of the investigation, however, was on those computers that can be classified as belonging to the Intel/Microsoft duopoly (Wintel): using MS-DOS and Windows operating systems.

1997 findings

Table 4.4: Home Ownership of Personal Computers 1997

Year Group	BSCS	CCS
Year 7	47%	16%
Year 8	52%	11%
Year 9	55%	16%
Year 10	62%	22%
Year 11	67%	32%
Year 12/13	72%	38%
Whole school	59%	20%

BSCS: Boston Spa Comprehensive School
CCS : City Comprehensive School

What these figures demonstrate is an increase in student ownership from Year 10 onwards. The disparity between BSCS and CCS, however, can be contextualised by comparing results from the first survey carried out at BSCS in February 1995 with that undertaken at CCS in December 1996.

Table 4.5: Home ownership of Personal Computers (IBM compatible): disparities

Year Group	BSCS February 1995	CCS December 1996
Year 7	26%	16%
Year 8	31%	11%
Year 9	35%	16%
Year 10	42%	22%
Year 11	46%	32%
Year 12/13	49%	38%
Whole school	35%	20%

Two possible interpretations can be placed on these figures:

either students at CCS are two years behind those at BSCS in terms of acquiring PCs, and that individual access to machines will increase during the coming years (with an expected increase in ownership after the Christmas holiday);

or the figures reflect the social and economic differences within the population.

The ownership of home PCs, the use of them for schoolwork, the acquisition of skills and concepts represented by them and the value placed on these by society represent the economic and cultural capital of the Information Society. The divisions highlighted in these results reflect groups that have been termed 'Information Rich' and 'Information Poor' (Blair, 1998).

If students see the possession of a computer as empowering them, both in terms of ease of production and quality of production of school work, and if this translates into enhanced grades for examination coursework, then the issue here is simple. Schools have the responsibility to ensure that all students have equal access to the technology that creates those opportunities. The demands of the labour market suggest that students who leave education without the concepts and accompanying skills developed through constant computer use and application will be economically and socially disadvantaged.

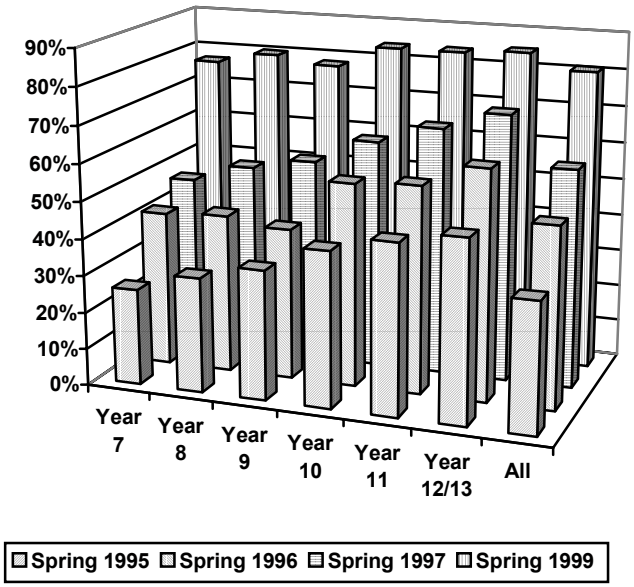
Extending ownership: 1997– 99

The Spring 1997 survey was then compared with the results from that undertaken in Spring 1999. The most significant growth in ownership occurred between these years. Comparison can be made with previous years.

Table 4.6: Ownership growth at Boston Spa Comprehensive School, 1995-99.

Year Group	Spring 1995	Spring 1996	Spring 1997	Spring 1999
Year 7	26%	42%	47%	77%
Year 8	31%	43%	52%	80%
Year 9	35%	41%	55%	78%
Year 10	42%	55%	62%	84%
Year 11	46%	56%	67%	84%
Year 12/13	49%	62%	72%	85%
Whole school	35%	49%	59%	81%

Figure 4.3: Ownership growth, 1995-99



As the student cohort moves through the school, so the incidence of ownership increases. Students in Year 7 when the first survey was undertaken were in Year 11 for the final sample. Table 4.7 illustrates the increase in ownership.

Table 4.7: Cross-year comparisons

Spring 1995		Spring 1996		Spring 1997		Spring 1999	
Year 7	26%	Year 8	43%	Year 9	55%	Year 11	84%
Year 8	31%	Year 9	41%	Year 10	62%	Year 12/ Year 13	85%
Year 9	35%	Year 10	55%	Year 11	67%		
Year 10	42%	Year 11	56%	Year 12	72%		

Factors affecting the growth in ownership

The acquisition of a high-value good is based on the assumption that its purchase will produce a number of benefits. As part of the research, students were asked to write a letter to a friend, who had asked whether it was worth obtaining a computer for school work. Their comments illustrate their perceptions that ownership of a computer has enhanced their work, and indicate factors that young people consider important.

Student attitudes to computers

> The only bad point of doing your homework on a computer is that you tend to find you have a lot more homework as you cannot write things up in lesson. ... PS Make sure you get some good games etc. Doom2 is an excellent game....
>
> (Boy, Year 10.)

Here the student has identified an increasingly common pattern. Students are increasingly regarding the classroom environment as a place in which work is not 'written up'. If a lot more homework is produced at home this has significant implications for students, in terms of the time they go to bed, the materials they bring to school and, possibly most importantly, the fact that no-one is seen to 'work' in class.

> the writing is smaller when you print it out ... you have to write more so you get a better mark.
>
> (Girl, Year 9.)

If work rate was traditionally measured in terms of handwritten pages of an exercise book, then the shift to 12-point word-processing on A4 pages is significant. Less sophisticated students try to compensate by using larger fonts, or increasing the size of the header and footer. Others '…write more…'.

These student comments illustrate themes identified at the outset of the research. The first is that students are now doing work at home that they would otherwise have done at school. The second is that many students find that using a computer tends to objectify their work. What is produced is seen as an artefact, and evaluated as such: it correlates with the students' sense of 'neatness'. Improvements to the artefact are related to the rewards of the task.

As one student in the survey commented,

> Now I use my computer for all the work I do apart from Maths and things like that. I can draw on my computer, make music, listen to music, write stories, look up words to find a meaning for it like a dictionary, print out any work I want for homework. I think it makes homework a lot easier because of all the different programs.
>
> (Boy, Year 9)

For this student the computer was integrated not only with the process of work and the products which were produced, but also the environment of work. The mechanical aspects of work, such as printing out, the functional aspects, such as looking up the meanings of words, the creative – drawing, writing stories and the recreational – listening to music, are brought together. Another student described the other changes produced by his computer:

> Computers can make homework need a lot more time, even if you're very good at using them, because you end up spending a lot of time tweaking your work. The end product can look very good, especially with expert use. Spell checks and automatic language aids such as Thesaurus help your writing. Computers with reference software, such as "Encarta" are great for research. AmiPro2 is the best word processor/d.t.p. program in the world. Apart from AmiPro3. You can also sharpen up your brains playing games such as Tetris and Doom.
>
> (Boy, Year 10.)

In this example we can observe a double effect. The student not only spends more time 'tweaking' the work, but also works harder at the process to become an 'expert'. Work is no longer limited to the recall of input from teachers, but extended through 'research'. A constant theme of students is the way in which

work and research are combined through the availability of CD-ROM reference works. Involvement with the task of homework was seen as a part of personal and intellectual development: research, improving work and developing games-playing skills - 'sharpen up your brains' - are part of the same process.

The ease of production of artefacts enabled young people to see themselves as moving beyond previous limits imposed by motor skills, time and performative competence.

> On my PC we have AmiPro, for a word-processing package and Lotus 1-2-3 as a spreadsheet program. I use the computer to word process assignments as my handwriting is very messy. Also because it is easy to change things, and move things around. On AmiPro there is also a Thesaurus, a spell-check and a grammar check, which I think improves my work.
>
> (Girl, Year 10.)

The value which computers create in work done for school were clearly perceived. As long as marks were awarded for presentation and lack of surface errors, then the use of a computer would enable you to score more highly than if one had not been used.

> ... they can get you marks for presentation, spelling, punctuation and sentence structure. If I do a draft and want to change it, it is quicker and easier than scribbling and making the paper messy, so you can read it.
>
> (Girl, Year 10.)

The cumulative effect of these programs on student work was to produce a document hegemony. A document is qualitatively and quantitatively different from an essay. A document will contain sections with appropriate titles, charts, tables and clip art, page numbers and possibly footnotes. Students who used word processing programs were enabled to produce such documents, especially if they used templates or wizards. Because they were able to produce such artefacts, the expectation developed that all work should be reproduced in such a way. The expectation initially took root among the students, where it became the norm - the accepted and expected way of working. This in turn became the expectation of their teachers, most of whom were themselves unable to produce such documents. (This is illustrated in Chapter 5: 'What teachers think about IT.')

The documents were paginated, used a range of text formatting styles (often based on document templates), incorporated checking systems such as spelling, Thesaurus and grammar and produced a high-quality print-out. Reference sources from CD-ROM were often pasted into such documents at will.

> I have a CD-ROM at home and find it very useful when doing projects ... (it) could result in getting better marks as you have more info on the topic.
>
> (Girl, Year 9.)

In other words, using information that was not available at school, and which, by its very nature was up-to-date, generated added value. The quantity of work produced in this way is likely to increase as students move from Key Stage 3 to 4 and GCSE. For the 94-96 GCSE cohort at the school the average was 30 substantial pieces of coursework during five terms.

Students clearly perceived the impact of a personal computer on productivity.

> The amount of time spent on homework is still the same but when on computer you end up doing more detailed work and more of it too.
>
> (Boy, Year 10.)
>
> I find it a lot quicker to write up on a computer, and I find it much easier to write as it all just flows out.
>
> (Girl, Year 10.)

Access to programs which would facilitate the production process became a priority during this period.

> ... if you don't have a computer and your handwriting is not too good then you could lose marks for being untidy...
>
> (Boy, Year 9.)
>
> It won't get you extra marks for content, you may get some for presentation. It may be possible, though, to pick up extra marks if you use a special program like Encarta 95 ... an easily operated, vast encyclopedia with many facts and lots of information. At home it will help improve research skills and speed up the time doing it, so you can get more written content in your work.
>
> (Boy, Year 10.)

The student recognises the importance of presentation, and although he distances himself from saying directly that he will earn more marks for it, he is aware that the medium and the message are closely intertwined.

> ... 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.
>
> (Girl, Year 10.)

The approach of students to schoolwork, coursework and assignments is linked to the information technology resources available to them, whether at home or at school.

> ... it is easy to change things, and move things around ... there is also a Thesaurus, a spell-check and a grammar check, which I think improves my work.
>
> (Girl, Year 10.)

A consequence of this is that the amount of time which is spent using computers for work, and the range and volume of the tasks undertaken, is often far greater than that of their teachers. Mention has already been made of the average of thirty documents that students produce in five terms of GCSE coursework.

> I think that no matter what teachers say about you not getting any extra marks for the work being printed, a well-presented piece of typed work with (obviously) no crossings-out and no spelling mistakes can make a teacher go "Wow!" as soon as they see it.
>
> (Boy, Year 10.)

Student computer use

Students see computers as an integral part of their lives: all of the students in the school surveys (1995; 1996; 1997) who listed more than one use of a machine cited schoolwork as the primary use, with games as a method of relaxation.

Students saw the main use of computers for work as word-processing. Correct spelling, legibility of text and good presentation were consistently cited as reasons for using a computer. Comments previously cited illustrate this (52% of users Year 7; 42% of users Year 10; 32% of users Year 12).

The production of documents, rather than simple pages of text, is stated as becoming more important through Year 9 into Year 10. The ability to

incorporate graphs, tables and clip art into a document was seen in transactional terms: the better produced the document, the higher the grade it was likely to earn (57 % of users).

Student reference to, and use of, spreadsheets was therefore seen as a means to an end - charts and tables - which were to be incorporated into documents. The use of databases, on the other hand, was restricted to specific subject applications. These were Mathematics (Years 7-9) or Business Studies and Economics (Years 10-11). Students rarely perceived databases as a way of organizing information to achieve their own ends. Only from Year 12 onwards were databases seen as a way of organizing and manipulating data.

Most students at this time viewed computers as a tool for information access and retrieval through use of CD-ROM and Multimedia. A consistent reason for using computers was given as '...learning about things...', but few linked the structure and content of the CD-ROM with databases. (This resulted in inefficient or inappropriate CD-ROM searches: '...there isn't anything about...' or, even worse, hundreds of 'hits' in which a single word had been identified. Search routines needed to be taught, rather than simply acquired. As the Internet became the default information source this problem became even more acute.)

The concept of 'learning about things' is explored later in the study, in students' concepts of Mind.

The 58% overall response in the survey of students using a computer for work suggested that students saw it as a tool. The application of the computer to work increased in frequency as the students moved through school.

(The March 1999 survey showed 81% of students in the school with a computer at home and using it for work: Year 7: 77%; Year 8: 80%; Year 9: 78%; Year 10: 84%; Year 11: 84%; Years 12/13: 85%).

Gratifications: why students say they use computers

When the survey was initiated one purpose was to identify the reasons students gave for using computers. It was decided to use a 'Uses and Gratifications' methodology. (A more detailed explanation for this choice can be found in Chapter 2.) The students were asked to complete a form with two prompts: 'I use computers for … because…' for both school and home use. The data for the analysis of Gratifications was drawn from the responses to the prompt

'because...', which were then collated into sets. Four separate sets of responses emerged.

Table 4.8: Gratifications: responses by type

Category	Diversion	Relationship	Personal Identity			Surveillance
			(a.) Personal reference	(b.) Reality exploration	(c.) Value reinforce-ment	
Female	51%	1%	16%	4%	96%	16%
Male	69%	1%	28%	5%	97%	18%
Total	60%	1%	22%	4%	96%	17%

The research literature on young people and computer use does not provide a taxonomy for classifying these responses. A framework therefore had to be constructed to enable such a classification. Whilst the existing literature on computer uses and young people (Underwood and Underwood, 1990) at the time the investigation began had no model, one could be found within Media Studies. Audience research into television use by young people had developed a functionalist perspective based on a 'Uses and Gratifications' model. (McQuail, 1969; 1981; 1987). The framework of what people use television for, and their reasons for so doing, suggested that a similar approach could be applied to another medium. A Taxonomy of Computer Uses was devised.

Information Technology and its uses: media, audience and the escapist thesis

One approach to the use of Information Technology by young people treats the subject as an extension of the entertainment media. The focus is on the recreational aspects of computer use: young consumers purchase interactive media and games, and the users are therefore regarded as an audience. Their uses of IT media are seen from the same perspective as their uses of other media. The dominant interpretation of media uses by young people is that of entertainment, particularly 'escapist' entertainment. Such interpretations have developed into moral panics focused around such issues as racism, sexism and violence in computer games, VDUs as a vector for epilepsy and global computer

pornography delivered via the Internet. Indeed, there is a Center for Online Addiction to cater for misuses of ICT (www.netaddiction.com (1998)).

Whether or not entertainment and 'escape' can be seen as 'good' depends on the ideological position of the writer. The concept of entertainment as escape essentially derives from a nineteenth-century view of popular culture, which is seen as oppositional to 'high' culture. This was the perspective which informed the work of media researchers such as Lowenthal (1950) and Schramm, Lyle and Parker (1961). Others (Horton and Wohl) saw media use as a social alternative, or as 'parasocial interaction', in which gratifications sought could include emotional release, stimulus or vicarious compensations. Some identified the 'mythic' function of modern entertainment (Morin, 1960).

Much of the evidence for these theses is based on data that apparently indicates that heavy use of media is associated with personal/social deprivation; media analysis that proves there is persistent reality distortion and the popularity of material that is considered to be without intrinsic merit. The 'escape' thesis is regarded as proven by the final fact the use of mass media is a matter of free personal choice. These perspectives and assumptions have been transferred to an analysis of the interaction between young people (predominantly male) and computers.

Some early audience studies into television use focused on the concept of the viewer as consumer, in that individuals in a democracy (or free market) had freedom of consumer choice. In 'TV as a common culture', (Westley and MacLean, 1957), had treated mass media provision and consumer selections as a reflection of the general needs of the social system to orient itself to its environment. Rosengren and Windahl (1972) established a number of correlations between mass media consumption and direct interpersonal interaction, and found that the fewer the opportunities for interaction, the higher the reliance on mass media content. This interpretation has developed and refined itself in relation to computer use, whilst at the same time establishing a dichotomous interpretation of its effects. When the effects can be seen to reduce commuting and develop the use of telecottages, they are good; when the effects are seen to encourage young people to spend hours in front of a VDU, they are bad.

Uses and gratifications

The relationship between media and its audiences can be considered from another perspective. The 'Uses and Gratifications' approach, at its most simplistic, asks: who uses which media; under what circumstances and for what reasons. 'Uses and Gratifications' has its origins in opposition to deterministic assumptions about media effects; it was termed 'the rediscovery of people' (Katz and Lazarsfeld, 1955). There was in addition an understandable desire to break out of the debate over mass media taste, in which the elitist position would hold that, since bad art drives out good, mass media must, per se, be Bad. 'Uses and Gratifications' could be seen as a Functionalist approach to the study of media, where the media can be considered as a part of the individual's immediate environment (Fearing, 1947).

The first phase of 'Uses and Gratifications' theories, its 'classical' period, used a description of audience sub-group orientations to selected media content to establish the uses to which it was put: radio, (Herzog, 1944; Suchman, 1942); newspapers, (Berelson, 1949). The second phase can be termed its 'modern' period, in which attempts were made to use gratifications data to provide explanations of the communication process (Katz et al., 1975).

Children and computer use

The conceptual framework of the mass media 'Uses and Gratifications', and in particular its application to the young television viewer, provides a tool through which the use of computers by young people may be analysed. Three studies provide particularly pertinent insights.

Himmelweit, Oppenheim and Vince

Himmelweit's Theory of Displacement, in the comprehensive study 'Television and the Child' (1958), suggests that TV viewing displaces activities which are functionally similar. The study was an extremely detailed analysis of the interaction between children and television in the United Kingdom. The Displacement Theory was perhaps their most significant finding, in that it implicitly identified reasons for viewing. The study was concerned to

investigate the effects that television had on children's lives. It examined what children did with television and the uses to which they put it.

Greenberg

The child audience study in London, (Greenberg, 1972) constructed a typology of uses. Children were asked about the gratifications they obtained from TV viewing by completing the sentence 'I watch TV because ...' The answers were grouped under eight headings, with sub-groups: Relaxation; Companionship; Learning about things; Habit; To pass time; Learning about myself; Arousal and To forget.

McQuail et al.

The 1972 study of television audiences in Leeds and its 1975 modification (McQuail and Gurevitch) defined a range of uses to which television was put by its audiences. Greenberg's typology was updated and synthesized by McQuail, whose 1987 categories were grouped under the headings of Information, Personal Identity, Social Integration and Entertainment. This typology forms perhaps the most definitive analysis of the uses to which television is put, and the reasons people give for using it. One conclusion that was drawn from this was that the emphasis in any study must therefore be on the processes through which the content is used. This reinforced the findings of Cullingford (1984).

User taxonomies:

From the findings of the various studies McQuail constructed a number of taxonomies. The first is one of media-person interactions, and provides the most effective tool for examining computer use by young people.

Diversion

a) Escape from constraints of routine;
b) Escape from burdens of problems;
c) Emotional release;

Personal relationships

a) Companionship;
b) Social utility; TV is used as a 'coin of exchange' - a common area of experience for talk.

Personal identity

a) Personal reference;
b) Reality exploration;
c) Value reinforcement;

Surveillance

Material for information and opinions about events in the wider world.

McQuail's observation on this typology is that researchers should expect to encounter changes in it for three main reasons. First, as a result of changes in audience experience and perception; second, as a result of changes in communication patterns (and technology); and finally, as a result of changes in social patterns. These comments were made about television and its audience. The speed of technological change, the status of computers as a consumer good with peripherals priced to stimulate the demand of a young market and the promotion of IT through the education process are factors that make this typology even more susceptible to change.

Computer use gratifications.

The four main categories of gratification identified by McQuail for people's use of television provide immediate parallels with young people's use of computers. The questionnaire was designed to examine who used which type of computer; under what circumstances and for what reasons. The focus throughout was on the processes through which computers were used by young people.

The first set of categories are Diversion. The responses cited entertainment, escape from boredom, excitement, a break from work and fun. What was significant in this grouping, however, was the number of students for whom doing work on the computer constituted 'fun'.

The second set dealt with the use of computers for establishing, developing or maintaining social relationships: Integration.

The third set, Personal Identity, constituted the greatest number of responses and consisted of three subsets: awareness and knowledge of computer

applications; the transfer of skills and concepts to develop work; the uses to which hardware, software and peripherals could be, and were, put.

The final set of responses, Surveillance, dealt with the use of computers for extending skills and knowledge - finding out about things. Frequent reference was made to the use of CD-ROMS and other information-based software. Later surveys identified Internet use.

Student comments have been taken from response sheets.

1. Diversion (Entertainment)

a) Escape from constraints of routine:
"I play games when I need a break from my work/other things…";
b) Escape from burdens of problems:
"If I can't do my work I play a game to take my Mind off things…";
c) Emotional release:
"I play when I'm bored, or when I need to relax"…;

2. Personal relationships (Integration)

a) Companionship: working with a friend on an assignment; playing games;
b) social utility: games (and their strategies) are used as a 'coin of exchange' - a common area of experience for talk;
c) using the computer to produce work for the family.

3. Personal identity

a) Personal reference: the development of computer skills and a knowledge base: students were concerned to demonstrate their knowledge of their computers and what they could do. The emphasis was on systems and programs that could be identified as 'real', rather than those of school.
" on my PC we have AmiPro, for a word-processing package and Lotus 1-2-3 as a spreadsheet program ...";
b) Reality exploration: understanding how and why to undertake tasks on the computer:
"... it is easy to change things, and move things around ... there is also a Thesaurus, a spell-check and a grammar check, which I think improves my work."

The student recognises the importance of mastery, of being in control of the computer.

c) Value reinforcement: the perceived correlation between computer-produced work and better grades:

" ... 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."

This was a particularly strong response. A number of students at Y10 and 11 commented that IT skills were now a prerequisite for most jobs:

"...Computers are expensive but if you didn't have one you probably would be degraded because of it in later life ..."

4. Surveillance (Information)

This is interpreted as providing the student with material for information and opinions about events in the wider world. It represents finding out independently, of being able to access knowledge as and when the student wants. The use of Careers databases in and CD-ROM in the School Library, Multimedia at home and the Internet were all cited by a range of students as a way of being able to find out about all the topics which might be of interest.

" ... Computers with reference software, such as "Encarta" (an interactive multi-media CD-ROM encyclopedia) are great for research." "...Encarta 95 ... an easily operated, vast encyclopedia with many facts and lots of information. At home it will help improve research skills and speed up the time doing it, so you can get more written content in your work..."

Table 4.9: Gratifications: a summary of findings

Diversion	Y7	Y8	Y9	Y10	Y11	Y12
Female	76%	71%	72%	28%	19%	19%
Male	86%	85%	97%	64%	44%	36%
Total	81%	78%	84%	49%	32%	29%

Integration	Y7	Y8	Y9	Y10	Y11	Y12
Female	4%	1%	1%	0%	0%	0%
Male	1%	2%	0%	0%	1%	1%
Total	3%	1%	1%	0%	0%	1%

Identity	Y7	Y8	Y9	Y10	Y11	Y12
Female	99%	91%	97%	96%	95%	97%
Male	97%	94%	100%	100%	100%	97%
Total	98%	93%	98%	98%	98%	91%

Information	Y7	Y8	Y9	Y10	Y11	Y12
Female	3%	16%	16%	27%	12%	33%
Male	6%	13%	35%	22%	12%	25%
Total	5%	14%	25%	24%	12%	29%

Gratifications analysis

Two sets of gratification dominate the responses: from the Diversion category, Diversion and Pleasure, and from the Identity category, value reinforcement.

Table 4.10: Diversion and pleasure

	Y7	Y8	Y9	Y10	Y11	Y12
Female	76%	71%	72%	28%	19%	19%
Male	86%	85%	97%	64%	44%	36%
Total	81%	78%	84%	49%	32%	29%

The use of computers as an entertainment tool peaks at Year 9 for boys: for girls there is a slight downward trend from Year 7 through Year 9. Thereafter there is a sharp downturn. Although Entertainment still constitutes a significant gratification, the imperatives of GCSE coursework re-focus computer use. Despite this, a number of students at Years 10 and 11 use the gratification 'fun' to describe coursework using computers: "It's more fun on the computer ..."

Figure 4.4: Computer gratifications: diversion and pleasure

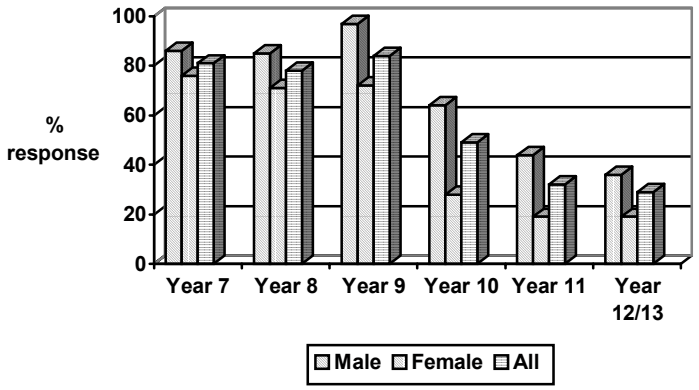


Table 4.11: Personal relationships (integration)

Integration	Y7	Y8	Y9	Y10	Y11	Y12
Female	4%	1%	1%	0	0	0
Male	1%	2%	0	0	1%	1%
Total	3%	1%	1%	0	0	1%

The percentage response for this section was the lowest of all of the gratifications cited by students. Despite the apparent low response, however, personal observation would suggest that computers and their applications are a focus of conversation and thus facilitate relationships. Conversations range from ways in which to manipulate data for assignments, to ways in which to progress through computer games. A significant point is the way in which conversation focuses on sets of abstract procedures: data handling and manipulation or shared imaginative access to games world (McShane, 1991). The final survey, in 1999, took place before the explosion of email use among young people, based on free, web-based email services.

Personal identity

Table 4.12: Personal reference: the development of computer skills

	Y7	Y8	Y9	Y10	Y11	Y12
Female	7%	8%	23%	43%	52%	31%
Male	6%	3%	22%	39%	16%	17%
Total	6%	6%	23%	42%	34%	25%

These responses, as a percentage of the total number of responses, show a sharp upward trend from Year 8 through Year 10, with only slight variation for Gender, would suggest that the ubiquity of PCs with a Windows operating system has established a software hegemony in the Minds of the students. Their concept of what constitutes a computer, its operating system and software are all predicated on Microsoft software and PC architecture. What is clear, however, is that many students have a detailed knowledge of programs and the operating systems which they can customise to their advantage. This reaches its peak for Year 11 males, who are at the stage where they feel that they can at least establish mastery over one aspect of their lives.

Figure 4.5: Personal reference: the development of computer skills

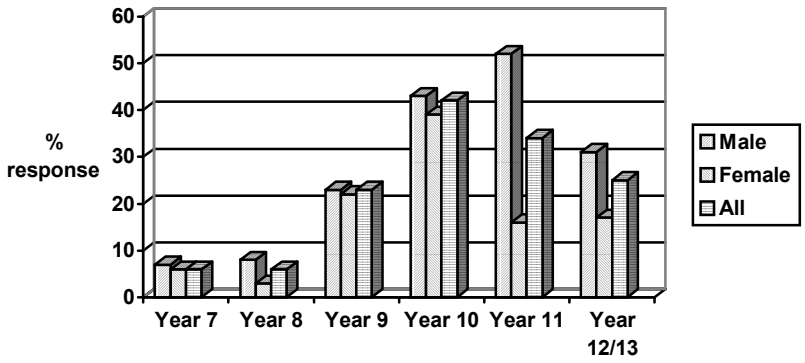


Table 4.13: Reality exploration: understanding how and why to undertake tasks on the computer.

	Y7	Y8	Y9	Y10	Y11	Y12
Female	3%	4%	3%	9%	2%	2%
Male	5%	3%	4%	9%	5%	0%
Total	4%	4%	4%	9%	4%	1%

Year 10, with 9% citations for knowing how and why to undertake tasks on the computer, represents the peak of responses. One explanation for such low responses throughout the age and gender range could be that the processes and concepts are internalised, so for many students this gratification represents an integral part of computer use. Such students could be said to be in transition from embedded to disembedded thinking, in that they are able to transfer learned patterns of behaviour to the creation of new objects. They are demonstrating competence, freed from their old limitations (Donaldson, 1987). Disembodied thought involves the manipulation of symbols: however, far from being abstract, the symbols young users manipulate on their computers have tangible links to the concrete and the artefacts that they create. Another reason may be more fundamental, in that, whilst many students have an implicit understanding of how and why they do things, they are unable to explain this. (Cf. Vygotsky, 1962.) This has implications for the demands placed on students (and teachers) by the National Curriculum.

Figure 4.6: Reality exploration: the understanding of computer tasks

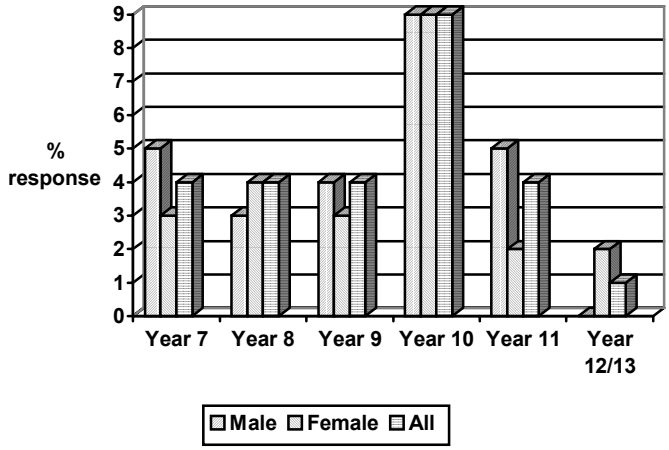


Table 4.14: Personal Identity: value reinforcement

(The perceived correlation between computer-produced work and better grades.)

	Y7	Y8	Y9	Y10	Y11	Y12
Female	99%	91%	97%	96%	95%	97%
Male	97%	94%	100%	100%	100%	87%
Total	98%	93%	98%	98%	98%	91%

This was the strongest and most consistent gratification cited by students. The perception that using a computer to produce coursework resulted in higher grades is a recurring theme in students' comments. The survey of teacher perceptions and uses of Information Technology in the following section would appear to confirm student perceptions.

Figure 4.7: Personal identity: computer use and value reinforcement

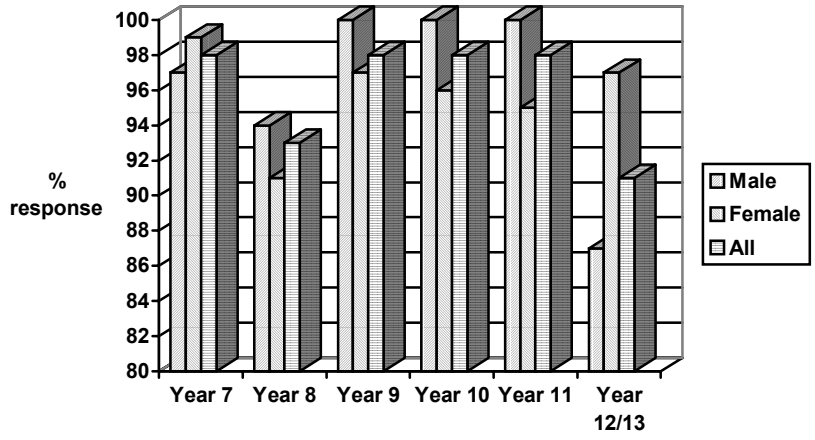


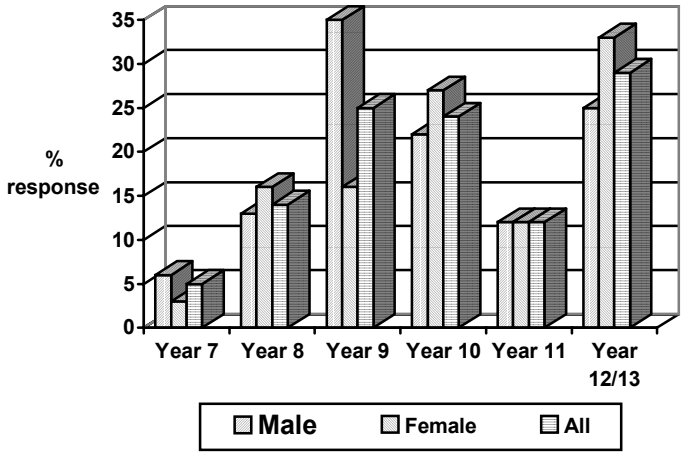
Table 4.15: Surveillance

(Material for information and opinions about the wider world.)

	Y7	Y8	Y9	Y10	Y11	Y12
Female	3%	16%	16%	27%	12%	33%
Male	6%	13%	35%	22%	12%	25%
Total	5%	14%	25%	24%	12%	29%

Whilst part of the reason for the number of responses in this category can be ascribed awareness of the Internet and Multimedia, or even access to these at home, it was the integration of CD-ROM and multimedia packages in into the Year and Departmental curriculum that had the most significant effect. As part of Careers Education Year 9 students used databases such as JobFile Explorer: post-16 students used databases such as ECCTIS and PUSH. This would explain the response peaks, in Years 9 and 12. Other groups used CD-ROM disks as information sources within the curriculum: The Times on CD-ROM, Encarta and other multimedia encyclopaedias, Interactive Shakespeare, and so on.

Figure 4.8: Surveillance: information about the wider world



Two main conclusions can be drawn from these findings.

The first is that the responses form a close fit with the categories developed by McQuail for the gratifications cited by young people for television use. This four-part taxonomy would seem to be an appropriate framework for computer gratifications, both in the range of responses generated by young people and in the fact that, during the whole period of the survey, these responses were consistent.

The second conclusion is that the majority of the gratifications are extremely functional: they fall into the category of Personal Identity, and, in particular, the sub-set of value reinforcement. Students see computers as a tool for amplification, for the enhancement of their work. Earlier comments have indicated the centrality of ICT to the ways in which students see themselves as fitting into a learning community and the wider post-industrial world. Personal identity responses recognise this fact: the value reinforcement sub-set works both in the context of school work (see Appendix 1 and Appendix 2) and the wider world of employment.

Over time one would expect to see the percentage of responses for Surveillance increase, as more students use Internet, CD-ROM and Multimedia information sources. At the time of writing the factor that inhibits home use of

the Internet is that of telephone costs. This is particularly apposite when telephone accounts are a frequent site of conflict between parents and their children.

The Relationships category, on the other hand, is one for which few students made explicit mention: at an implicit level, however, computer use, especially in school, generates a range of relationships as students work together (Somekh, 1986; Somekh and Davis, 1991; 1997; Underwood and Underwood, 1990). It may be that, although students regularly work in twos or threes at computers, this is not to be perceived as constituting a relationship. It is work. The same is true for interactions about computer games. As previously noted, these responses were made before the mass availability of email. At the time of the survey only those with an internet service provider had access to email.

Discussions are often seen as information exchange, rather than the basis for inter-personal discourse. One feature of studies of television gratifications, however, is that, whilst most respondents cite 'entertainment' as the main reason for viewing, many go on to discuss the value of television as a 'coin of exchange' (Morley, 1986) in social situations. This is an aspect which applies to discourse about the use of computer games as well as ways in which to use specific applications to produce work for school.

Reality exploration is the most problematic sub-set of the Personal Identity category. One reason for this may well be the constant focus on outcomes, rather than processes, that has been at the heart of the school IT RoA programme. Another may well be that this is, in fact, how people view computers and their uses: tools of the mind and tools of the hand. (Bruner, 1966; cf. University of Sussex study of teleworkers; staff responses to the computer use survey.) Computers as objects are real. The processes which are undertaken on them are virtual. Outcomes produced by computers as a result of virtual processes are real. This modality judgement on the part of the majority of students in the survey may well explain why the response rate for reality exploration was so low (1 - 9%). The high of 9% was recorded in Year 10, when there is a significant learning curve associated with the use of computers for examination coursework.

Whatever the reason may be, there is a need to make much more explicit the concepts of data handling. The observations of Vygotsky, that learners are able to undertake operations without necessarily being able to fully explain the processes underlying them, would seem to suggest that a focus on the language involved in the processes and concepts should be a central part of the teaching

process. Study of student conversations relating to computers (mentioned earlier) may provide a way forward (Whorf, 1956).

The development of a hegemony: PCs and student use

The first survey at BSCS, during the academic year 1994-95, sought to identify those students who used a computer at home. Students identified the type of machine to which they had access, and the uses to which it was put. Table 16 shows those who said that they had a computer which they could use for work, as opposed to those which could only be used for games playing. During this survey many of the students identified difficulties they had with computers such as Amiga and Atari, which they tried to use for work but which were more suited for games-playing. A consistent comment from students was that they wished that they had a PC, which they saw as a 'real' computer.

Table 4.16: 1995 survey

Total number of respondents with a computer at home (n=1132).

All types: work and games	PC ownership
733	466
(58%)	(35%)

Survey comparisons: observations

The increasing facility of young people to utilize computing resources in their work suggested that they had internalized the routines and skills required by the software which they employed. Comments made by students in Years 9 and 10 obtained during the second survey, which asked them whether they thought it worthwhile to obtain a computer for schoolwork (quoted in earlier sections), bear this out.

The ways in which students used computers reflected their facility. Comments which students made through every survey substantiated this. One example was that

> ... I do find that I do get better marks … you think about what you're doing more.
>
> (Girl, Year 10.)

This student perceived the enhanced marks as a consequence of thinking more: the computer enabled her to do that. It was not simply a cynical reflex that equated neat word processing with a higher mark. Each survey indicated an increasing number of students using their home computers for work, and spending more time on their work. They enjoyed it, often referring to it as 'fun'. It generated a sense of pride and ownership.

The resources that they deployed shaped the ways in which they worked.

> ... it is easy to change and move things ... there is also a Thesaurus, a spell-check and a grammar check.
>
> (Girl, Year 10.)

Work was therefore subject to constant revision and improvement. The time that the students spent working on computers increased with the resources available to them.

Teacher uses

Teachers spent far less of their working day using computers than students. A similar survey to that of the students indicated that such use as took place primarily involved the production of worksheets for students (74% of respondents cited 'typing' - word-processing as their main use) or administration: entering orders on the school SIMS terminal (School Information Management System), or student data for departmental records. This involved the production of class and set lists, rank order lists and other administrative tasks. Teachers undertook these tasks on school PCs or Archimedes machines, or on machines at home. No year team, department or member of staff indicated that data from SIMS was used for this task, or that SIMS itself was used. SIMS was regarded as an electronic order-generating machine. The reality is that it can be used for a wide range of data- handling and data processing tasks, which can then be integrated with other programs.

Teachers also used equipment at home far less than did students. Whilst 43% of staff respondents had access to a PC at home, only 57% of this total stated that they used the PC for word-processing - the most frequently cited activity. Teachers consistently used the word 'typing' to describe this.

In other words, fewer than 25% of the school staff used a computer at home - even though 43% of the staff had access to one.

The primary use of their computers was for word-processing: the production of worksheets, correspondence, church newsletters or recipes.

The survey was repeated in late spring 1996 to determine whether the same increase in PC ownership and access had occurred as with students during the same period. Ownership and access appeared to have increased to 52% of staff respondents.

However, only 60% of the teaching staff completed the return. When the non-return of the questionnaire was followed up with individuals the response could be generalised as lack of interest in, and knowledge of, computers. If the staff total was used as a base, therefore, and we assumed that teachers who failed to complete a return neither used information technology in school nor owned a computer, an even more negative picture emerged.

Table 4.17: Computer use at school and home: teacher response, 1996

Staff	n=111	W/P	S/S	D/B	CD-ROM	CAL	CAD	Control	Internet	Video-conferencing
School use	40% (44)	40% (44)	11% (12)	18% (20)	7% (8)	29% (32)	6% (7)	2% (2)	4% (4)	4% (4)
Home use	32% (35)	32% (35)	11% (12)	11% (12)	9% (10)			1% (1)	4% (4)	

(Key: W/P = word processing; S/S = spreadsheets; D/B = database; CAL = Computer Assisted Learning; CAD = Computer Aided Design; Control = Control Technology.)
Numbers in brackets refer to the numbers of teachers using particular applications.

This would suggest that the staff as a whole may not have internalized the skills and concepts implicit in the application of computers to work in the same way as had students. It would support current government assumptions on the need for in-service education to improve teachers' computer competence – the New Opportunities Fund.

This disjunction has had serious implications for teachers.

> Once you have finished and the teacher asks you to add or do it again you can say "OK" without a face.
>
> Boy, Year 9.

Access to a computer enables instant and easy revisions. Students are able to focus on changes to the content, rather than on re-writing a complete piece of work.

Conclusions

In 1988, one Year 10 student at Boston Spa Comprehensive School regularly produced documents with embedded charts and tables. Other students were able to wordprocess text and generate accompanying charts and tables. The majority of students had to hand-produce assignments: their expectations were framed by the skills and time available to them, and their work shaped accordingly.

The comments from Year 9 and Year 10 students during the research undertaken during the summer term of 1995 show that an overwhelming majority of students saw the boundary of their possibilities at a different level. For them, the technology available to them represented their limit. Those students who did not have access to these facilities at home, or who did not use them at school, were still aware of what was possible. Their peers provided compelling evidence of what could be done. The aphorism 'The Medium Is The Message' (McLuhan, 1964) had altered for our students. Not only did the medium determine the way in which the message was read, but it also determined the way it was produced - and, inevitably, the content.

The accelerating ownership levels of personal computers among school students had been accompanied by an increase in use, both in terms of the time spent using machines, and the range of tasks for which they are used. Students have internalized information technology concepts which may well be different from those of their teachers. Students see the product as the integration of a number of computer facilities through their computer skills. They use and synthesize information, rather than selecting and filtering it. The availability of Internet and CD-ROM information sources presents a range of informational possibilities: far greater than those a student could access in a conventional school library, or from domestic reference books. Students no longer rephrase one or two text sources for their assignments: they select from a range of them and assemble a collage. They epitomize what has been described as the post-

modern condition (Baudrillard, 1987), in which no text or source is privileged over another.

Curriculum applications of Information Technology, especially those required by the Statutory Orders of the National Curriculum, sit unhappily with these practices. Much current pedagogy seeks to identify opportunities to integrate Information Technology applications with specific sections of subject curricula. On the other hand, students who use their computers for as much of their work as possible integrate their subjects with the appropriate applications of their computers and their skills. This disjunction is explored in a later section.

Students concern themselves with the final product, and the way in which their computing resources can be used to shape that. The ways in which the text is generated will determine the text itself. Similarly, the range of charts which can be produced from a set of data will stimulate critical responses to the data itself. When students can, with a minimum of effort, generate and print one chart after another they are able to discern patterns and trends, rather than having to determine what the pattern or trend was, and then produce an accompanying chart.

Reflections

Throughout this research I was aware of the disjunction between the processes and attitudes that students brought to the work which they undertook on computers at home, and that which they did at school. Recurrent responses in the 'because' section of the school survey were 'because it's in the National Curriculum'; 'because we have to'; 'it's part of Maths'; 'the teacher makes us'. Home was seen as the site of production, the place where serious work could be done, and where the student was able to control the working environment, particularly with the computer.

This raised a number of issues for teachers. One was a matter of control. How did the teacher cope when a significant number of the class had made the decision to work at home? Were students right when they said that work produced on the computer earned more marks? How could teachers redress the balance for those who did not have access to a computer at home?

The OFSTED inspections of 1993 – 1997 found that IT capability was poor in 40% of schools inspected, with a lack of coherent development, particularly at key Stage 4 (Years 10 and 11).

With each survey I undertook the issues became more clear-cut. There was a significant difference between what students were using their computers for at home and what they were using them for at school. As teachers we found ourselves struggling to link the potential of home and school and embed it into the curriculum.

Surprises

As the percentage of students with access to a home computer increased the initial gender disparity, in which more males than females had access to a computer, reduced. As the distinction between a computer which could only be used for playing games and one which could be used for both work and games disappeared, so the number of girls with a computer which they used for work increased. In part this was due to the marketing of multimedia PCs, with CD-ROM reference tools, as a consumer good from Christmas 1996 onwards. In part it was also due to the fall in the price of printers, particularly colour printers. PCs were now seen as creative, rather than technical, tools.

For the final survey there was no significant gender difference in use and ownership of personal computers.

The first survey had indicated that a significant number of students had access to a personal computer at home and were using it for work. It also demonstrated that there was a perception at a 'real' computer was a PC running Windows-based software similar to those found in most office. This was contrasted with many of the computers students encountered in an educational environment, which were seen as in the control of their teachers and part of the school curriculum. As the number of students using a home PC increased so did perceptions as to what constituted a 'real' computer and how it should be used. Increasingly these perceptions were at variance with the expectations and expertise of their teachers.

These disparities are explored in Chapter 5.