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INFORMATION TECHNOLOGY IN PRACTICE

A STUDY CONDUCTED IN THE

BUSINESS EDUCATION SECTORS

OF SUNDERLAND, TYNE AND WEAR

PAULINE COLLINS B ED (HONS) CERT ED (FE) RSA DIP

A Thesis by Research for the Degree of

Master of Arts in Education

at the

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A C K N O W L E D G E M E N T S

Heartfelt thanks go to my family, my husband Peter and daughter Lesley Ann for their forebearance and to my Supervisor John Steele for his help and encouragement.

A B S T R A C T

INFORMATION TECHNOLOGY IN PRACTICE
A STUDY CONDUCTED IN THE BUSINESS EDUCATION SECTORS OF SUNDERLAND, TYNE AND WEAR

PAULINE COLLINS B ED (HONS) CERT ED (FE) RSA DIP

This research is concerned with the impact and influence of information technology on the curriculum of Business Studies courses in Sunderland. Fifteen educational establishments from the tertiary, secondary and private training agency sectors participated in the research. Data was collected in the form of questionnaires completed by Tutors and Learners, interviews with Tutors and observation of classroom practice.

No evidence was found of any communication link between educational institutions within the same educational sector, or between the tertiary, secondary and private sectors, to rationalise software, collaborate on resource provision or develop progression levels between sectors in Information Technology in the Business Studies Curriculum.

Utilisation of information technology in the business studies curriculum was found to have a positive affect on extending the attention span, increasing the interest and heightening the motivation of learners generally. These factors are all the more evident when learners are using software which has colour, movement and graphics.

Generally learners in a practical IT learning situation help each other in problem solving situations. There was no evidence of learners being absorbed in interaction with computers only.

Learners from the secondary sector particularly enjoy IT and the suggestion is made that they perceive IT more for leisure purposes than business applications.

The role of the Tutor has not moved towards that of Facilitator or Manager as a result of the impact of Information Technology and little evidence was found of true integration of Information Technology into the Business Studies Curriculum.

Certain recommendations are made.

C H A P T E R 1 - INTRODUCTION - THE REVIEW OF PERTINENT RESEARCH

The purpose of this chapter is to explore, from the existing sources, the dimension of the issue and elicit specific concepts. The subsequent findings are categorised into main areas as follows:

Literature concerned with the:

a development of the computer in education

b development of Information in Society

c development of Information Technology in the curriculum of:

  i secondary schools

  ii further education colleges

  iii higher education colleges, polytechnics, universities

  iv primary schools

d the trend towards Computer Assisted Learning (CAL) and, as a focus for future research,

e a statement of a number of possible research areas applicable to this subject area but not strictly in the remit of this particular piece of research.

The review of existing literature is summarised in section f.

Section 7 details the review of literature from a personal perspective and this is followed by section 8 which highlights the pertinent issues arising from the personal perspective and the review of the literature as a focus for the ensuing research.

DEVELOPMENT OF THE COMPUTER IN EDUCATION

It is suggested by Peltu (1981) that the roots of information technology can be traced back almost 2000 years to the Chinese abacus. The mechanical computer was invented in 1823 but the 'father' of computing is generally recognised to be the British inventor Charles Babbage who, in the 1930's, developed a machine known as the 'Analytical Engine'. This introduced the important concept of control by a program which could be input to the machine, in this instance, punched cards.

In schools, during the 1950's and early 1960's, the computer centred in a few Science and Mathematics Departments. The relative complexity of the machines ensured that only the more able pupils were likely to utilise them. At this time the needs of the embryonic computer industry for operators/programmers and analysts provided some impetus and justification for including "computing" as a school activity.

In 1969 the Schools Committee of the British Computer Society produced a document "Computer Education for All" in which it was recommended that all school children need to know something about computers if they are to be able to cope with the society in which they will mature as adults. According to Longworth (1976), 'Developments in computer education tended to accentuate the trend away from its mathematical origins'. Longworth cites two important projects in this connection ie The Schools Council "Computers in the Curriculum Project" (1973) and the National Development Programme for Computer Assisted Learning (1974). The former project floated the idea of computer education as a link between subject disciplines in the Schools. According to Rushby (1983) the purpose of this programme was to investigate the use of computers as a learning aid in the field of education. During the lifetime of the programme many projects were funded in different areas of education with a wide range of applications and included, for example, Computer Assisted Learning in Geography, using computers in the undergraduate Science curriculum, computer managed learning in school Mathematics and the Computational Physics teaching laboratory, amongst many others. All these projects made use of either mainframe computers, with or without remote links to terminals or minicomputers sometimes supporting a number of data lines.

However Longworth makes the important point that the numbers of non-mathematicians prepared to investigate COMPUTING education (ie what the machine can do) as opposed to COMPUTER education (how the machine works) was very small.

According to Rushby (1983) there were many benefits in using computers in education. "It is claimed that the computer could motivate the student and in many instances enhance the student's learning. However . . . there were 2 principal factors which severely restricted the wider use of computers as an aid in education. Firstly . . . the cost of a user station has been too prohibitive to allow widespread use in education. Secondly, the lack of expertise amongst teachers in the use of computers prevented their widespread use in educational establishments." p.35.

However in 1971 Hawkes reported that 'the use of computers and computer technologies is beginning to breakdown the inter-disciplinary barriers between subjects . He also hoped that fears and prejudices would be replaced through education by confidence and familiarity. In 1986 Brown and Danby stressed that 'the education of teachers must emphasise that the computer is one of a range of tools and should be available to all as it is required regardless of academic ability or status. Cotterell and Ennals

(1988) stated that "Computers must be viewed as an integral part of everything that is learnt, lest computer science and computer scientists be placed on a pedestal - a familiarity with technology will become second nature to most pupils and students . . .". p. 88.

In an article in "Computers in Schools" (1986) Sparkes gave 4 reasons for teaching IT as part of a general education for all secondary pupils, "Britain needs information technologists, pupils need jobs, education for capability and social awareness".

However "computing" skills are not viewed as being of paramount importance by the higher education sector Cotterell and Ennals (1988) say "University Departments of Computer Science prefer their undergraduates not to have taken such courses (computing), seeking instead evidence of sound studies in traditional subjects". This therefore has important implications for the linking of IT studies between the FE/tertiary and higher education sector, particularly in view of the move by Mr Baker, Minister of Education (1989), to make some Universities concentrate on teaching at the expense of research (TES June 1989). Speaking to scientists at the Academia Europa (a conference in London of European academics) he said that, "in future,

research and teaching would be funded separately" and continued "not all Universities will be able to sustain front-rank research in all fields in the future".

However one can only agree with De Ferranti (1971) that the advent of the computer has caused a new discipline to evolve - "the computer has been claimed by some as a fourth "r" in education and the key to the new learning".

Toffler (1980) leaves us in no doubt as to the 'industry' of the twenty-first century. He states that the new civilization will be the Scientific/Technological age stating that "the key to the new evolutionary advance is the computer. Whereas the industrial society of today enhances our muscle power, the computer will enhance our mind power!"

Bellini, in "Rule Britannia" (1981) forecasted that in the 1980's the only employment will be in the service sector and other knowledge based employment. For the year 2000, Bellini divides the nation into employed and unemployed stating that architects and designers will be replaced by computer graphics and accountants and clerks will be redundant". "Jobs that remain" he continues "will be performed by brighter robots working at a database".
Bellini believes that Britain will proceed on the lines already followed historically although the new feudal system will be based on knowledge rather than land. At the top will be the information class (once the landed gentry), next will be the priests of education, next will be a small group of machine minders but with very little knowledge of the main order of society; at the bottom will be countless millions of unemployed - "knowledge is power, now as in 1066!". Although in 1991 we now have evidence of computer technology affecting every facet of our daily lives there

is no evidence that access to information technology has changed the social structure of our society.

Five years later the IT Advisory Panel (1986) made a similar statement ". . . the social problem of IT illiterates unable to cope with the automation of a society based on information and the establishment of a privileged elite in control of this vital commodity.

"All forecasters have their own particular theory for the future of society. Longworth's research of four pertinent publications in 1976 concludes "education to alleviate the effects of mass unemployment (McLuhan), mass bewilderment (Toffler), mass ignorance (Rose) or mass misunderstanding (Martin and Norman)" but he continues "a common theme which runs through them all is that of the importance of computerised technology which will pervade every aspect of our lives, including our education." p. 1.2.3.

Longworth states that within a democratic system of government will be man's capacity to receive, assess critically, store methodically, retrieve dynamically and communicate effectively the information he needs to know in order to carry out his function as a citizen and a worker and Longworth came to the conclusion that information is a word which has connotations far beyond the world of the computer and stretches out into such problems as personal

relationships, media control and communications and he concludes by saying that 'sooner or later the education services will have to catch up with society; it cannot be the other way round'.

According to the Report by the Information Technology Advisory Panel in 1986 "there is no doubt that by the year 2000 knowledge will be the key strategy".

Our traditional library-based information service will also be affected. According to Henley (1970) "With the vast amount of new information and ever increasing tasks of specialisation in all areas of human knowledge, demands are being made on library information storage and retrieval systems which can scarcely be met by traditional methods." p.1

Rushby (1983) "The skills of the future will need to relate to the computer in society. Our future education will be on-going life-time education to adapt to changes in employment needs which may become increasingly temporary in the future". p.45

The importance of information and knowledge is acknowledged by the IT Advisory Panel (1986) "Information and knowledge are rapidly becoming the key resources for future economic success. Education is a vital factor to reverse the UK's relative decline as new economic opportunities, able to

assess the exploitation of knowledge as a resource open up and IT will be an essential tool for education if it is to succeed."

3 DEVELOPMENT OF INFORMATION TECHNOLOGY IN THE CURRICULUM: SECONDARY EDUCATION

Information Technology is defined by Brown and Danby (1986) as

"The technology associated with the storage retrieval manipulation communication and production of data by electronic means. The data can be vocal, pictorial, textual or numeric and the interaction facilitated by IT can be between people and machines or between machines only. The study of IT includes the economic, social, moral and political implications of its use and all its applications to education, commerce industry and other areas of everyday life." p. 9

The definition by the British Advisory Council for Applied Research and Development (in Sparkes 1986) defines Information Technology as follows:

"The scientific, technological and engineering disciplines and the management techniques used in information handling and processing; their applications; computers and their interaction with men and machines; and associated social, economic and cultural matters." p. 81

According to Rushby (1983) Secondary schools preceded the primary schools in using microcomputers but the 'organisational problems and the ties to examination syllabuses have severely limited the use of computers across the curriculum. The IT Advisory Panel (1986) found that IT was used more flexibly in primary rather than secondary schools and that this might be attributed to the tighter control of teaching methods and subject content in secondary schools through the curriculum and examination system. Another reason why primary teaching can adapt more easily to using IT was thought in that publication to be that the job of the primary teacher involved a large element of managing learning rather than teaching.

According to Rushby (1983) investigations into the adoption and use of computers in British secondary schools indicates that the most frequent use is still for teaching computer science and for computer clubs. Although Rushby feels that there is every indication that the content of the present secondary school curriculum could change rapidly to take full advantage of information technology He continues "in practice, the evidence of other innovations introduced into schools indicates that the widespread use of computers in schools will develop slowly."

The transference of information technology education/training between primary and secondary schools is adequately highlighted in the publication by Brown and Danby (1986) but there appears to be no similar record of transition from secondary to FE/industry. Part of this research will attempt to discover if there is any transference of information technology skills between these sectors. Some of the principles portrayed by Brown and Danby are relevant to these sectors eg ". . . the diversity of that experience (information technology) amongst children entering secondary schools makes it imperative that problems of continuity are addressed. There must be liaison if the secondary schools are to enable their new pupils experience to be utilised and developed further". The authors make the important point that "The skills and

processes involved in and affected by educational computing are more important than issues of content" and that "effective continuity . . . will involve teacher commitment, understanding of the diversity of computer applications and awareness of the implications for learning and teaching. A further important finding from Brown and Danby (1986) was that secondary school teachers sometimes ignored their pupils previous experience in IT and started afresh. The reason for this was cited as being that 'some primary schools make use of computers more than others, which means that pupils will transfer to secondary schools with a disparity of computer skills. It will be interesting to discover whether this is the case between secondary and tertiary. The authors suggest that to alleviate this problem of transfer of IT skills all teachers:

a are helped to identify the knowledge, skills and concepts relating to these (IT) areas

b have an awareness of the structure and the sequence of computer related experiences

c are able to identify the stage which each child has reached within that structure at the point of transition

d can respond to each child's needs in the most appropriate way so that continuity is not interrupted or, at least that interruption is minimised.

Brown and Danby (1986) suggest that primary and secondary children collaborate on local community projects using electronic media to communicate information. They cite the Domesday Project as an example of this kind of co-operation. They suggest that pupils co-operate in inter-school demonstrations and technology fairs. Brown and Danby further advocate that "it is of great importance that teachers should, as part of a continuity approach, (in computing) identify and deal with the range of problems and constraints which can influence its effectiveness". Examples of constraints and ways of overcoming them are given as:

"1 TEACHING STYLES AND APPROACHES: exchanging of views, ideas and syllabuses, providing opportunities for direct observation of classroom activities within and outside the current phase, providing direct contact with other children - inter and cross phase and developing and identifying linked and compatible approaches.

2 CURRICULUM ASPECTS: provide opportunities for adopting cross-curricular child centred approaches, responding to change and external influences, establishing and overcoming differences in curriculum content.

3 COMMUNICATION: providing teacher guideline support, interchange of documents/guidelines/policies, developing and interchanging records, developing systems for monitoring and evaluation, providing

opportunities for the interchange of information ideas and attitudes.

4 ORGANISATION: understanding and responding to the differences in organisational demand, appreciating physical differences in educational establishments, appreciating differences in staffing and management structures, dealing with time limitations, dealing with pressures from outside influences eg government initiatives.

5 RESOURCES: the provision of adequate financial support, continuing and updating of support, reviewing and allocating existing resources, balancing human and material resources." pp. 14|15

The authors strongly urge that Information technology should not be seen purely as a subject but as a multi-faceted resource which should be used by all teachers and all pupils as appropriate.

Williams (1985) sets out in tabular form the stages of Piagetian Development stages and compares these to stages in computer learning. The table for the 11-15 age group is reproduced below:

TABLE 1

PIAGETIAN DEVELOPMENTAL STAGES, LEARNING PROCESSES AND COMPUTER LEARNING 11-15 YEARS

STAGE	LEARNING PROCESSES	COMPUTER LEARNING
Period of formal operations		
The 11-year old may group information with hypotheses about the possible	Developing cognition based on abstract symbolism	A computer language facilitates problem solving and exploring of hypotheses on an abstract level
The 12-year old may believe the world can be changed by thought.	Thinking no longer tied to representations of reality, can be based on abstract symbolism	Exploring the realm of possibility on the computer
The 13-year old student reasons hypothetically, considering the logic of all possible components.	Reality secondary to possibility	Exploring and applying pro-
The 14-year old student performs controlled experimentation	Logical thinking used to check theories for logical consistency	
	Logical reasoning used to synthesize opposing or contradictory information	

Source: Williams, F. & Williams, V. (1985) Success with Educational Software Praeger Publishers USA p.71

With this type of information available teachers should be better able to choose and use the most appropriate software for the age range in question. A modification of Table 1 linking software applicatins with computer usuage is provided in Table 2.

TABLE 2

PIAGETIAN DEVELOPMENTAL STAGES, LEARNING PROCESSES AND COMPUTER LEARNING 11-15 YEARS WITH SUGGESTED PRACTICAL APPLICATIONS

STAGE	LEARNING PROCESSES	COMPUTER LEARNING	SOFTWARE APPLICATIONS
Period of formal operations			
The 11-year old may group information with hypotheses about the possible	Developing cognition based on abstract symbolism	A computer language facilitates problem solving and exploring of hypotheses on an abstract level	Basic programming
The 12-year old may believe the world can be changed by thought.	Thinking no longer tied to representations of reality, can be based on abstract symbolism	Exploring the realm of possibility on the computer	Flow chart work or "what if programs"
The 13-year old reasons hypothetically, considering the logic of all possible components.	Reality secondary to possibility	Exploring and applying probability	"Spreadsheet" concepts
The 14-year performs controlled experimentation	Logical thinking used to check theories for logical consistency Logical reasoning		Databases

As Rushby (1985) points out "We need to provide a similar quantity and variety of educational software to allow teachers the same degree of choice as they have for books." Williams further tabulates the software suitable for three different levels of education ie Pre-school, Elementary and High School, broken down into "subject" categories eg a suitable software package for High School students to promote reasoning skills would be a package called Comp-U-Solve. Again more of this type of information would assist tutors when attempting to utilise information technology in the classroom.

According to Rushby (1983) "In primary education there will be a need to teach children how to develop their learning strategy rather than learning facts. In secondary education the emphasis could shift from learning problem solving skills and factual information to learning how to access information and use it for specific applications. This may lead to a merging of the subject curricula, being based on using technological resources and developing information handling skills."

In a MORI poll reported in the Sunday Times and conducted to discover the use of IT by the public and managers (November 1989), one of the statistics showed that 85% of the respondents believed that IT will help children at

school (Appendix 2). It was also reported that 87% of children use a computer in Secondary school but evidence to support this fact was not given for this statement!

The Government is funding a major study of the impact of IT on children's achievements. This is being conducted by King's College London in association with Peat Marwick McLintok and will be ready in 1992. In a survey carried out by Page and Nash (1980) it was revealed that "15% of boys and 5% of girls in the survey who say they want a technological career are unlikely to be equipped with the relevant subjects to be able to fulfil that ambition." They also say that "46% of boys and 47% of girls who are as yet unsure as to whether they would be interested in a technological career would find it very difficult to pursue such a career if they finally choose in that direction because of the non-technological content of their school curriculum".

In 1988 the Government launched a five-year "IT in Schools" initiative which involved appointing 650 IT advisory teachers. However in 1989 (TES June) Government decided to cut its share of the education support grant spending on information technology by £5m, effectively reducing the advisory teachers to 350 if the remaining money is not met by local education authorities.

And yet it has been stressed by many authors, in particular the Information Technology Advisory Panel (1986), that "above all else IT makes learning more pleasurable".

A DES survey of IT in schools (reported in the TES 1988) stated that there was an average of 23 micros per secondary school. This figure is not substantial bearing in mind that such schools could have around a thousand pupils. The report also omitted to give information of the actual siting of the computers within the school so that information could be gleaned about access.

Again in an article in the Times Ed Supplement (1989) Jacky Griffin reported on Information Technology in the National Curriculum in that there are 3 distinct forms of IT within the curriculum

"IT as a tool

IT as a resource

IT is a body of knowledge skills and expertise whose acquisition enables pupils to understand its values limitations and implications". She reports that "progression in IT should be by increasing the range and complexity of the tasks."

It is also interesting to note that the official National

Curriculum documentation (DES 1990) states that "at each key stage pupils should develop information technology capabilities through a range of curriculum activities which will:

develop confidence and satisfaction in the use of information technology, and

enable pupils to take greater responsibility for their own learning and provide opportunities for them to decide when it is appropriate to use IT in their work."

The development of confidence in the use of IT has many implications for education eg teaching methodology and the use of IT as a resource tool for learners. It also has timetabling curriculum/integration and access implications; issues which will be addressed in this research.

A report in the TES (1989) on the National Curriculum Council's Consultation report on Technology, which was delivered to John MacGregor on November 3 1989, states that "The recommendations make it clear that an integrated approach to the teaching of technology requires a commonwealth of 5 equal partners, art and design, business education, CDT, home economics and IT. At secondary level pupils should expect to use computer aided

design and draughting techniques, collate, sort, analyse, interpret and present information and know how computer systems control machines and equipment."

The NCC also endorses the working group's proposal for an information technology capability profile component. The attainment target now reads "Pupils should be able to use information technology capability to communicate and handle information, design, develop, explore and evaluate models of real or imaginary situations; measure physical quantities and control movement. They should be able to make informed judgements about the application and importance of information technology and its effect on the quality of life."

As far as GCSE is concerned, SEAC proposes to consider further whether the attainment targets and programmes of study for IT capability have sufficient substance to justify the award of a GCSE certificate. It is not yet clear whether this will lead to the adoption of the working group's proposal to bring together work in IT capability and IT-based work in design and technology capability to form a GCSE in Information Systems but this approach has widespread support.

As far as IT is concerned, one can perhaps take heart from some of the remarks of School's Minister John Butcher to the

annual conference for IT in Teacher Education "It has the power to engage the interest and imagination of the youngest pupil, to motivate the disaffected, to further stimulate the gifted and to release the full potential of children with disabilities. The Government recognises the tremendous potential of IT as a classroom tool. Our policy is to promote IT in schools and to see that it is used to raise educational standards. Our goal is ambitious, it is nothing less than the full integration of IT in all classroom studies. We want to increase the extent and effectiveness of schools use of IT for the enhancement of teaching and learning for pupils of all ages and abilities right across the curriculum. Not only do we want pupils to learn with IT we also want them to learn about IT to experience its power and be able to use it in a discerning way both at school and later in life."

3. DEVELOPMENT OF INFORMATION TECHNOLOGY IN THE CURRICULUM.

ii FURTHER EDUCATION

There is a fundamental difference in the priorities of Universities and FE Colleges in Britain. The primary function of FE colleges is education and that of Universities, as seen by most University Lecturers, is research. This difference in attitudes between the 2 tertiary sectors may be attributable to the fact that, at this point in time, the funding of Universities includes a specific element for research purposes and therefore this influences their use of computers and Information Technology.

Colleges of FE, according to Cox in Rushby (1983), have many similarities with secondary schools and the adoption of computers has followed similar lines with the use of computers slowly spreading into various areas of the curriculum.

Cotterell and Ennals (FEU 1985) investigated the implications of fifth generation computers for FE and declared "we have yet to see the educational effects of college-wide networks" and that "electronic reference sources will take over some of the current roles of the books in the College library and may enable students to pursue their studies in greater depth". The authors decree that fifth generation computing cannot be viewed simply as an extension of present day computing and therefore cannot be introduced

with the same courses, languages, hardware or attitudes for the following reasons:

"1 The speed of technology changes has exceeded the capacity of academic computer scientists to keep up. The problem is all the greater for college lecturers.

2 Until recently there has not been literature available on which FE lecturers can draw for considered views of fifth generation computers.

3 The research into, in the UK in particular, intelligent knowledge based systems is, although distinguished, small in numbers.

4 To date Government plans for fifth generation computing or advanced information technology have given little place to education and non advanced FE in particular.

5 Government has not regarded FE as its preferred instrument of technology transfer and control is being increasingly passed to other agencies such as Youth Training Schemes run by the Manpower Services Commission" p.11

The authors therefore suggest adopting a "subject-based" approach "where the emphasis is on thinking about particular problems and where the computer enriches the teaching and learning of other subjects rather than perceiving computing as a separate unrelated study".

Presumably the authors would welcome the recommendations of an FEU report (1985) which advocates the development of courseware ie "software plus notes aimed at staff development to increase the awareness of FE lecturers of the implications of computer based learning for all aspects of the curriculum. This publication gives a number of examples, one being a business studies package for a B/TEC

Business Studies Diploma or Certificate course which assists in the realistic use of commercially integrated accounts and stock control programs.

Adrian Woods in "Microcomputers in Education" (1982) explored the feasibility of using CAL on B/TEC Business Studies Courses and found that business games were particularly useful in cross modular assignments - very simple exercises where students play against the machine. Students took decisions on planning, production, marketing price and new capital form.

Cotterell and Ennals (FEU 1985) made the following policy recommendations:

"There should be a DES national conference on implications of fifth generation computers for further education.

There should be an IKBS Education and Training Journeyman Scheme whereby lecturers are seconded from Further Eduction to work in advanced research centres for periods of 6 months.

Video and text materials should be prepared for use in staff awareness courses in colleges, together with software.

Colleges should be encouraged to establish Information Technology Development Units (the role of such a Unit, as suggested by the Authors is reproduced at Appendix 1).

College units should collaborate with each other and with subject specialists in developing applications courseware.

Company involvement should be encouraged in collaborative projects.

FEU and further education colleges should seek involvement in ESRC and Alvey programme Initiatives in the Educational Implications of Fifth Generation Computers." p. 27

Although there is evidence of some progress towards "information technology across the curriculum" this is still at "computer literacy" level therefore little progress has been made on the integration of the more advanced applications of fifth generation computers.

3 DEVELOPMENT OF INFORMATION TECHNOLOGY IN THE CURRICULUM:

iii HIGHER EDUCATION

As suggested earlier, at Universities computers are used widely for research and administration and in spite of their rich computer environment, computers are not used widely to teach students. According to Cox in Rushby (1983) the reluctance to use computers as a teaching resource in Universities can be attributed to many causes, examples of which are:

"University lecturers are often unwilling to devote the time to develop their lecturing skills or adopt new techniques.

University lecturers are sceptical about the value of educational software and its relevance to the undergraduate curriculum.

Incorporating CAL into the curriculum of a rigidly constructed course requires accommodation by the lecturer and student involved." p 44

Therefore Cox concludes that the prime use of computers in Universities will continue to be for research and administration for some time to come.

In a publication entitled "Computers in Higher Education and Research - The Next Decade (1976) the DES looked at the collaboration between Polytechnics and Universities regarding information technology and found little apart from an equal partnership arrangement between Newcastle Polytechnic on the one hand and Durham and Newcastle Universities on the other. There would therefore seem to

be a case for investigating the position of Sunderland Polytechnic in this respect because, according to the report "there are many research workers in polytechnics who need access to the same range of computer facilities as the users in Universities" and suggest that "efforts should be made to overcome the difficulties, due to the differences in funding, of working out joint proposals between Polytechnics and Universities".

A report by the Council for Educational Technology (1979), which looked at the contribution of educational technology to Higher Education in the 1990's, suggests that "the trend towards the availability of smaller, cheaper and more powerful computers will accelerate . . . which will permit much wider use of electronic management systems for such tasks as library and learning resource development in computer assisted and computer managed learning".

According to a report by the Information Technology Advisory Panel (1986), the Committee of Vice Chancellors and Principals, in its response to the Green paper on Higher Education in the 1990's, called for widespread analysis and debate on the future higher education needs of the UK and presumably information technology aspects will be included in these discussions.

TABLE NO 3
FIVE YEAR PLAN TO INTRODUCE COMPUTER WORK INTO EIGHT CLASSES AT LIDEN JUNIOR SCHOOL IN SWINDON

YEAR 1

One computer in the school, to be kept in the staffroom for the first half term. Staff to bee encouraged to take it home over weekends and holidays. All teachers and all children to use the computer in the classroom for short periods.

YEAR 2

An additional computer to be bought. Each class to use a computer for a continuous period of two or three weeks each term.

YEARS 3-4

Two more computers to be acquired. Classes to be paired to share a computer between them. Each teacher to choose one major piece of software for use over half a term; three difference packages to be used in a year. Meetings to develop coherent plans for use of adventure games, word processing, Logo and database work throughout the school in the following year.

YEAR 5

Two more computers to be bought. One each for the third- and fourth-year classes. First- and second-year classes to continue to share. Whole staff to review maths and language guidelines for the school to take information technology into account.

Source: Straker, A. (1988) Children using Computers Basil Blackwell Oxford p.208

The staff decided that their aims for their own professional development were very similar to their aims for the children, and that the best way to help all the children to feel positive and confident about using computers was for all the staff to feel the same way. They elicited the support of parents, and gave some priority to computer use on their occasional day closures for in-service work.

As well as accepting the implications of information technology more readily than other sectors, the primary sector also seems to have considered the problem of progression and development in information technology for the children. This is illustrated in Table 4 overleaf which is taken from Straker (1989) and shows how major applications of computing have been categorised according to the levels of learning proposed for the National Curriculum.

The positive effect on increased motivation has been well documented in the primary sector. Smith & Keep (1986) state that "most children have strong positive attitudes to microcomputers". According to Straker (1988) "anyone who has watched children working with a computer is impressed by the increase in their motivation and concentration". However a cautious note is struck by Hall and Rhodes (1986) that "because of the motivational effect of the micro it is possible for children who do not understand what they are doing to spend some considerable time just typing random keys before boredom sets in and they give up the task". Morrison (1988) found that "they (primary school pupils in Scotland) typically enjoy working with microcomputers and can be well-motivated by their use". He goes on to say that Information Technology is adding to an understanding of the cognitive and perceptuo-motor capabilities of primary school children thus indicating that "children are perhaps more able, than has sometimes been thought, to

TABLE NO 4
MAJOR COMPUTING APPLICATIONS CATEGORISED INTO NATIONAL CURRICULUM LEVELS OF LEARNING

LEVEL	PROGRAMING ALGORITHMS	DATA HANDLING	TEXT MANAGEMENT	GRAPHICS, MUSIC	ADVENTURES, SIMULATIONS
1	BIGTRAK JUMBO MAZE	BARSET	PODD MOVING IN WRITER	BUILD MOSAICS WINDOW	TREASURE HUNT MAGIC ADVENTURE ALBERT'S HOUSE
2	LOGO FARMER CRASH	OURFACTS SORTING GAME	WRITER STORY (H&h) INFANT TRAY COMPOSE	IMAGE PICTURE BUILDER COMPOSE THE FARM	LOST FROG SLYFOX GRANNY'S GARDEN
3	LOGO LOCKS CARGO	OURFACTS DATASHOW NOTICEBOARD BRANCH	PENDOWN TELEBOOK TRAY FRONTPAGE CHATTERBOX NEWSBULLETIN	IMAGE MOSAIC PICTURE-CRAFT EDFAX CARTOON	DRAGON WORLD MALLORY WHISPY WOOD PUFF THE NATURE PARK DRAGON DROOM
4	LOGO CONTROL LOGO FROGS BOAT REVERSE	GRASS GRASSHOPPER BRANCH	AS ABOVE	AS ABOVE	FLOWERS OF CRYSTAL MARTELLOW L CARS IN MOTION SUBURBAN FOX

NOTE: LEVEL 2 INDICATES THE ATTAINMENT OF AN AVERAGE 7-YEAR OLD
LEVEL 4 INDICATES THE ATTAINMENT OF AN AVERAGE 11-YEAR OLD

SOURCE: CHILDREN USING COMPUTERS - ANITA STRAKER (1988) BLACKWELL

solve complex problems, acquire new and sometimes quite sophisticated skills".

Surveys have shown that more than half of all primary aged children have a microcomputer at home. This case of access may account for Govier (1988) noting that pupil "experts" have developed in some classes and these children command respect in the class and are seen in a position of superiority by their peers. She goes on to say that the position may be exacerbated by teachers turning to these pupils for help! She also makes the point that these pupils are "almost always" male. Hall and Rhodes (1986) found that there is substantial evidence of a bias towards males in computer use, both among pupils and among teachers. Although Hughes (1985) found "sex stereotyping in attitudes to computers in children as young as seven years", other studies have failed to find any stereotyping in the attitudes of pupils at upper primary and lower secondary levels despite the fact that twice as many boys as girls own home computers (Smith & Keep (1986); Harvey and Wilson (1985).

Govier reported (1988) that the Orwellian image of rows and rows of children each stationed at an individual micro has not happened in reality. She notes that . . . "more profitable discussion occurs around the micro than in any other classroom context" but qualifies that the reason for

this might be due to the aridness of much classroom activity rather than a feature specific to computers.

The implications of the experiences in the primary sector for those in the other educational sectors can be summarised as:

a change in traditional styles and role of teaching

b need to develop IT policy statements

c development of strong positive attitudes to computers

d awareness of the gender issue

THE TREND TOWARDS COMPUTER ASSISTED LEARNING (CAL)

Suppes (1966) is quoted in Shea et al (1983) as follows:

"One can predict that in a few more years millions of school children will have access to what Philip of Macedon's son, Alexander enjoyed as a royal prerogative, the personal service of a tutor as well informed and responsive as Aristotle".

Although technology has not made this entirely possible as yet, Table 5 below gives an indication of the technological progress to date. This shows that information technology has developed from a simple "linear" program approach through to dialogue systems.

TABLE NO 5
A HISTORY OF COMPUTERS IN EDUCATION

APPROACH	DISTINGUISHING CHARACTERISTICS
Linear programs	Derivation from behaviourism; systematic presentation: reinforcement and self-pacing.
Branching programs	Corrective feedback; adaptive to student response; tutorial dialogues; use of author language
Generative computer-assisted learning	Drill and practice; use of task difficult measures; answering student questions
Mathematical models of learning	use of statistical learning theories of limited applicability; response sensitivity
TICCIT	Team production of courseware; 'mainline' lessons; use of television and mini-computers; learner control
PLATO	Multi-terminal interactive system; visual displays; 'open shop' approach; concern over costs
Simulation	Computer as laboratory:

	interactive graphics; typically small programs
Games	Intrinsically motivating; audio-visual effects; often lacking educational aims
Problem-solving	Computer as milieu; programming by children; derivation from Piaget's theory and artificial intelligence
Emancipatory modes	Computer as labour-saving device; task-orientated; use of microcomputers and public information systems
Dialogue systems	Tutorial strategies; use of natural language; mixed initiative; use of complex knowledge representation.

Source: O'Shea and Self (1983) "Learning and Teaching with Computers - Artificial Intelligence in Education" pp. 68/69

According to a report by the Information Technology Advisory Panel (1986) "development in both hardware and software indicates that in terms of sheer processing power and flexibility, machines to rival the human brain are likely within the next decade". There is doubt, however, as to whether the computer can behave intelligently.

The argument that it can, stems from a brilliant article by Turing (Computing Machinery and Intelligence by Alan Turing in Mind October 1950 and reported in Hawkes (1971) in which he attempted to define how to measure intelligence and used a part game called "imitation". Two people, a man and a woman, go into a room and communicate through teleprinters with an interrogator in another room. The object of the

game is for the interrogator to determine which is which by asking questions, the man tries to prevent the correct identification by lying and the woman tries to help the interrogator. Turing proposed that the man be replaced by machine and that the machine could be said to be intelligent if the interrogator made as many incorrect identifications between the machine and the woman as he did between the man and woman.

Hawkes also states that "another group (of researchers) claim that machines will be intelligent only when they mimic man in every way" but as he points out "this is as fatuous as saying that aeroplanes will only fly when they flap their wings like birds". The IT Advisory panel (1986) also concluded that the methods used in such expert systems do not mimic human intelligence but instead employ the enormous information processing capability of computers to achieve similar results.

Cotterell and Ennals (1988) feel that intelligent tutoring systems suffer from a fundamentally disabling flaw in that they "cannot themselves perform the tasks that they are teaching; they do not know what it is to learn . . .". They go on to say also that "an intelligent tutoring system . . . will have to have knowledge of these (teaching) strategies and the capacity to select between them during the teaching process when putting them into practice". pp 83-84

Therefore the IT Advisory Panel (1986) do not subscribe to the view that, ultimately, sufficient of the teacher's knowledge and expertise can be incorporated into an IT-based learning system where there is little or no need for direct teacher involvement with students". They go on to say that "Education does not consist only of the acquisition of information or even knowledge and there remains a strong need for more conventional educational experiences to foster communication skills and social development". Cotterell and Ennals (1988) agree "there remain tremendous problems in building even a modest intelligent tutoring system".

However an important point is made by the IT Advisory Panel (1986) "that students using such systems (expert) are not being taught by a machine, they are learning from those who created the courseware which is embodied in the hardware and software of the system. The creators of the courseware have the same task as an ordinary teacher - to respond to the needs of the students in guiding them through the curriculum" and therefore the Panel do not envisage that machines will replace human teachers but expect them to provide valuable assistance throughout education and to allow the teacher to concentrate on helping the student to make the most of what IT can offer. They therefore see the teacher fulfilling the vital role of the "manager of the learning process" therefore "teachers must take a

positive attitude to the use of IT in education".

The IT Advisory Panel (1986), and other authors offer many advantages of computer-assisted learning:

1 electronic blackboard on which computer generated displays can be used by the teacher to enhance their presentation of course material.

2 The flexibility of IT based learning will avoid the necessity for all students to pursue exactly the same course of study and together with an improved capability for student assessment through IT, will allow a more varied curriculum to be supported.

3 There is obvious potential in the simulation capabilities of IT systems which allow students to become involved in situations previously excluded through cost, complexity or risk of accident.

4 The teacher may be distanced physically (in the case of computer networking) or temporarily (in the case of interactive video) but this need not imply a loss of communication with the students or a diminution of the intimacy of their relationship.

5 Computer-based learning can reduce instructional time while maintaining equivalent performance when compared with the traditional type of lecture/discussion techniques.

6 IT can motivate students strongly giving it a powerful advantage.

7 IT increases the cost-effectiveness of education and

training systems by eliminating variability caused by differences between instructors.

According to O'Neil, (1981) the advantages of computer based instruction are viewed in terms of cost reduction and improvement of effectiveness. He states that although other media share some of the advantages shown in Table 6 below, he believes that the entire set is unique to computer based instruction:

TABLE NO 6

ADVANTAGES OF COMPUTER BASED INSTRUCTION

PREDOMINANTLY REDUCING COST	PREDOMINANTLY INCREASING EFFECTIVENESS
Reduce training time	Provide consistent high-quality instruction available on large scale.
Reduce reliance on trained instructors	provide high-quality training at remote sites.
Reduce need for using expensive or possibly dangerous operational equipment	provide hands-on, performance-orientated instruction
provide rapid update of material	Permits individualisation of instruction

Source: O'Neil (1981) "Computer-based Instruction - A state of the Art Assessment p.3

The author does qualify the situation by discussing the limits of nonhuman replication as follows:

"Although it is possible to replace much of the education work . . . this work potential cannot be delivered to large

numbers of people without providing a suitable human environment. The replication of accurate information is usually imperfect because of changes in the information between printings or replications. Excellent teachers can correct this". He goes on "computerised coaching and counselling cannot encompass all of the counselling needs of individual students. Interpretation of tests and records must remain a human function, although computers can provide tentative interpretations".

O'Neil (1981) makes the important point with regard to the American educational system, that although millions of dollars have been poured into educational improvement and research, few findings have been able to "stick" or be implemented in schools and it appears necessary to change the whole delivery system and in so doing, change the traditions and habit pattern that make it so resistant to the introduction of change. This feeling of impending change in the structure of education is echoed by the IT Advisory Panel (1986) "that the role of formal education may shift and schools may have an increasing part to play in the social life of the community as co-ordinators as well as providers of education".

There are authors who do not necessarily see computer assisted learning as the way forward educationally. Hawkes (1971) states that "it can be argued that it does not make

sense to automate a process unless it is a highly repetitive one. Good teaching is not highly repetitive and I suspect that the computer can only be used to automate the kind of rote learning which is now considered very unfashionable". According to Shea "the desire to build an intelligent computer will not be easily satisfied. . . the fundamental difficulty lies in the fields of educational psychology for we do not know enough about how students learn . . . " Cotterell and Ennals (1982) make the same point "We know precious little about the psychology of learning and what we know is more relevant to the laboratory than to the classroom" and that "teacherproof education schemes prepared by remote academic reformers sit unused on the shelf or are adopted in name only".

According to Karbowiak & Huey (1971) at the present time Computer Assisted instruction systems fall into 2 broad categories "Control and practice type instruction systems which supplement the teachers instruction and tutorial systems the purpose of which is to take over from the teacher part of the task of the instruction of new concepts and principles". It is his opinion that students achieve significantly higher levels of proficiency through the use of computer assisted drill and practice instruction systems.

De Ferranti (1971) goes to some length to stress that under no circumstances can the computer based system ever replace the teacher and this seems to be true in practice. Although there is definite evidence of a change of role emerging for practising teachers and lecturers there are no signs of redundancies due to the impact of computerisation.

POSSIBLE RESEARCH AREAS FOR FUTURE INVESTIGATION

According to Sage & Smith (1983) "It seems almost mandatory for researchers to conclude everything they write with a remark about the 'need for further research'. If we do, it is not merely acquiescence in convention but a sober statement of bald fact." However the literature did provide a wealth of related issues, many of which would be fascinating to pursue but could not be attempted under the remit of this particular investigation. Examples are as follows:

1 Could IT be responsible for removing formal education from its base at the centre of our education system?

2 Could/should educational establishments provide a "social" function within communities?

3 Has the need for "physical" offices decreased as a result of the ability to communicate at a keystroke?

4 Is there a commercial opportunity to market "Education" as a "consumer" product?

5 Could IT-aided education be marketed as a leisure industry?

6 Is there a general trend towards shorter cycles of change?

7 What is the degree of retraining of staff by employers?

8 Investigation into the growth of alternative educational methods eg Workshop provision, Open and Distance learning etc.

9 The impact of the availability of non-UK educational

software in the UK.

10 The effect of IT on the contraction of educational establishments due to demographic trends.

11 The extensive effect of IT on examination systems.

12 How appropriate are the traditional barriers between academic disciplines?

13 An investigation into the separation of training and education.

14 The influence of the DTI (as opposed to the DES) with regard to the application of IT within education.

15 The effect on the numbers of IT-competent employees in Britain due to increasing incentives to move to overseas firms.

16 The impact and implications of Computerised Administration systems in Colleges.

f SUMMARY OF THE REVIEW OF PERTINENT LITERATURE

It is useful at this point to summarise the review of pertinent literature.

DEVELOPMENT OF THE COMPUTER IN EDUCATION

The early uses of computers were for mathematics but they have now developed into a tool for use with all subjects across the educational curriculum. However this development has been restricted by the financial constraints of purchasing hardware on one hand and the lack of appropriate staff development for teaching staff on the other. The importance of computer applications in education is unequivocal and by some it is seen as the fourth "R" in the curriculum.

DEVELOPMENT OF INFORMATION IN SOCIETY

The work of several prominent researchers who have forecasted the effect of computers and their powerful applications on civilization has been documented. The debate continues, however, as to whether the ability to easily access vast amounts of information will change the structure of society.

DEVELOPMENT OF INFORMATION TECHNOLOGY IN THE CURRICULUM

Evidence suggests that the primary sector of education has been more able to implement Information Technology into its

curriculum. There are definite signs of good information technology practice in the primary sector where attempts have been made to formulate IT policy statements and to devise a framework for progression and development in information technology. Although it is recognised that there are many constraints, it is suggested that there should be liaison between education sectors to take advantage of any previous IT skills/experience of pupils/students. This liaison could result in the recognition of various "levels" of information technology capability for each sector and eliminate duplication of "teaching" by the various sectors.

Educational sectors have substantially different approaches to information technology. The primary sector have purchased microcomputers and appear to be moving towards the ability to integrate IT into the curriculum. In the secondary sector microcomputers are also predominent and are slowly progressing from Mathematics rooms into other subject based areas to be used as a teaching tool. Colleges of FE have followed a similar trend to the secondary sector. The Higher Education sector, however, in the main, use their large mainframe computers for research purposes; although again there is evidence of a change of emphasis in this sector too.

There have been many surveys carried out to ascertain the effect of IT on learners. A particular example is its

effect on motivation. In the primary sector in particular there is well documented evidence to show that computers and information technology enhance the motivation of pupils. Generally there appears to be a move towards ensuring that integrated information technology is applied by pupils more confidently and appropriately to aid problem solving. It would appear that little work has been done to promote fifth generation computers into the curriculum of any educational sector.

THE TREND TOWARDS COMPUTER ASSISTED LEARNING (CAL)

Although at one point in time researchers envisaged that the computer might replace the teacher in the classroom, it would now seem that this will never happen. It is recognised, however, that the role of the teacher is changing, becoming more flexible and becoming more about an ability to "manage" the learning.

The research also highlighted a number of issues relating to information technology which could lend themselves to further investigation.

9 A PERSONAL PERSPECTIVE

As a lecturer in Business Studies in the Further Education sector of Sunderland, Tyne & Wear, I share the concern of many in education about the impact and influence of Information Technology on education and training and, prior to undertaking this present research, took the opportunity to undertake some parochial investigations in to the subject in pursuance of a BEd Hons Degree at Sunderland Polytechnic in 1988. The overall aim of the Dissertation was to investigate the ways in which the work of a secretary had altered as a consequence of technological innovation in order to document the implications for the design, curriculum content and training for secretarial courses at Monkwearmouth College, in particular for the London Chamber of Commerce Private Secretary's Certificate. The resulting recommendations are detailed below in Table 7. Whilst these recommendations incorporated the aims outlined above they also had wider implications.

TABLE NO 7
RECOMMENDATIONS EXTRACTED FROM PREVIOUS RESEARCH WORK
BY P COLLINS

1	There is evidence from the data of a definite lack of liaison between employers and Colleges as far as secretarial training in information technology is concerned and the Business Studies Department of Monkwearmouth College should take the initiative in this respect by appointing a specific Secretarial Lecturer to be responsible for this aspect of the curriculum with the remit of monitoring the constantly changing information technology market and hence the training requirements of employers thus ensuring the updating of curriculum content of the College's secretarial courses.

2 In view of the relevance of information processing to the role of t he secretary and the fact that this is recognised by LCC, who have included it as part of the overall certificate, the PSC course should be modified to enable students to take the information processing option offered by the LCC in addition to single-subject word processing examinations.

3 Students who hold qualifications in word processing will find this an advantage as far as employment prospects are concerned and the acquisition of such certificates should be encouraged but it appears to be equally important that the educational concepts of word processing should be understood by secretarial students in order to promote transfer of learning when students are confronted by other systems when they leave the College environment.

4 Information technology is very often defined as data or text processing and I found that I had to be particularly careful not to fall into this trap because the evidence clearly shows that communications technology is utilised as much as word processing and more than data processing. Therefore it is recommended that Lecturers encourage students to use the communications technology available to them at College ie Prestel in the library and the electronic mail facility at present housed in Room 108 at the Swan Street Centre.

5 The impact of information technology has not altered the need for secretaries to be able to demonstrate a whole range of life and interpersonal skills and because these skills are so necessary to the competent secretary it is recommended that the Course Team address the problems of ways in which these skills could be integrated into the curriculum of the LCC PSC course at Monkwearmouth College.

6 A further curriculum area to be developed by the LCC PSC course team should be to encourage their secretarial students to view themselves as being capable of increasing management effectiveness as this will be expected of them by their employers.

7 Whilst not supported directly by the empirical evidence and research undertaken, but in order to promote managerial/secretarial effectiveness, consideration be given to including, in the management courses offered within the Department, a component designed to enable

	Managers to utilise their secretarial services efficiently. Additionally, consideration be given to reviewing the degree of basic information technology training included on management courses.

Ref "An Investigation into the Course Design, Curriculum Content and Training implications of Technological innovation for the London Chamber of Commerce Private Secretary's Certificate - Sunderland Polytechnic 1988"

A review of the recommendations in Table No 7 above indicates that the scope of my previous research was narrowly limited to discovering whether secretarial students were being adequately educated/trained for the technological advances to be found in the jobs they would finally acquire. The overall aim was, therefore to assess COMPETENCE in the skill of information technology or the product model and did not touch upon the process implications of the role of information technology in the business studies curriculum generally.

Following the submission of the Dissertation to the Head of the Business Studies Faculty, however, the course in question has now been modified in line with the recommendations. The satisfactory outcome of this previous research, together with the interest in the process aspect of the topic emanating from my previous research period, has prompted this present, much wider, research, into current information technology practice in educational/training establishments in Sunderland generally.

The review of literature highlighted in this chapter has enabled me to focus in detail on the issues to be addressed in this current investigation and these are highlighted in the next section.

PERTINENT ISSUES ARISING FROM THE REVIEW OF THE LITERATURE

These issues have been identified as follows:

1 How is information technology perceived by the tutor and the learner in the Business studies curriculum?

2 What effect does the implementation of information technology in the curriculum have for the role of the tutor?

3 What degree of advancement has been made in information technology applications within the various educational sectors of Sunderland?

4 What developments have been made to integrate information technology into the Business Studies curriculum of educational establishments in Sunderland?

5 What are the "social" implications of the acquisition of information technology skills?

6 How does the acquisition of information technology skills affect the motivation, attention and interest of business studies pupils/students/trainees?

7 To what extent do the educational sectors within Sunderland communicate/liaise in order to ensure organised progression and development in information technology competence in learners.

In order to obtain as much data as possible, over as wide a section of the business studies curriculum as possible, this present research will include representative establishments of the various educational sectors in Sunderland, Tyne & Wear ie, schools, colleges, private business training centres and the Polytechnic.

The practical implementation of the research is outlined in the next chapter, chapter 3, Methodological approach.

C H A P T E R 2 - METHODOLOGICAL APPROACH

Consideration is given in this Chapter to the different ways in which the most important variables in the study might be measured and indications of the methodology to be used.

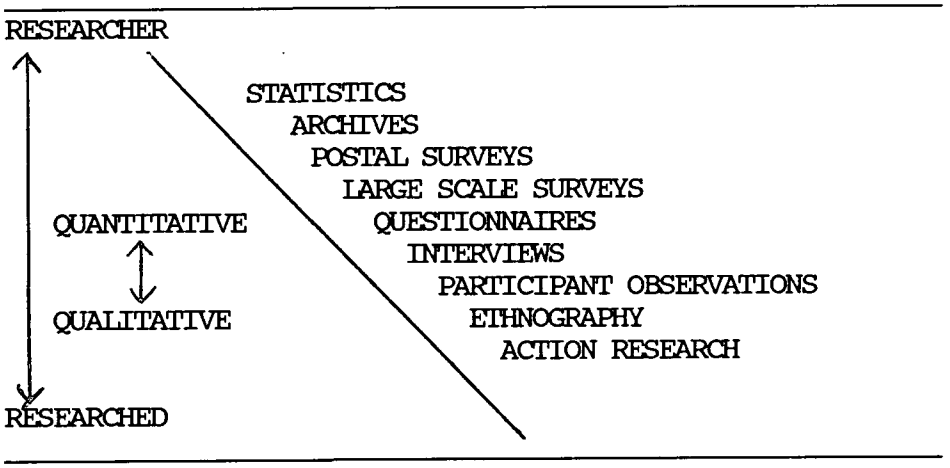
According to Daphne Johnson (Bell et al, 1984) the fieldwork period of a professional inquiry is likely to be where the researcher invests most in terms of time and personal involvement. For this reason it was critical that the most appropriate and effective techniques applicable for this particular inquiry were used and therefore this Chapter highlights the reasoning for the methodology which was utilised.

To assist in the selection of the most appropriate techniques it was useful to bear in mind the issues suggested by Elliott (1981) as to whether the techniques adopted would: "(1) provide evidence of how well the course of action had been implemented, (2) provide evidence of unintended outcomes, and (3) show a range of techniques". There is a wide and varied range of techniques available to the researcher and it is important to utilise a number of them to show multiple perspectives in order to establish greater validity and reduce the bias of the researcher.

In fact Elliott (1981) summarises 13 different ways in which data can be collected, ie Checklists, Observing, Shadow study, Triangulation, Analytical memos, Reports, Documentary evidence, Diaries, Interviews, Profiles, Tape/Video recordings, Commentaries and Photographic evidence and a number of these techniques were appropriate for my research.

Many authors plot methodological techniques along a spectrum indicating the subjectivity/objectivity of each - see Table 8 below. It can be argued that those at the qualitative end of the spectrum are usually considered to be subjective and possibly therefore lack a check on their validity whilst those at the quantitative end of the spectrum are considered to be too objective for small scale research as it is often necessary to go back to the data for true meaning. However this is an over-simplification of the advantages and disadvantages of the techniques and does not take account of other factors ie data of the more subjective type is often much more interesting or that postal questionnaires can never be truly objective because the parameters to the questions have already been set by the researcher. The point is reiterated therefore that a range of techniques is required.

TABLE NO 8
SPECTRUM OF DATA COLLECTION TECHNIQUES ILLUSTRATING QUANTITATIVENESS/QUALITATIVENESS



The first objective in this research was to enlist the help of appropriate training establishments and this was put in motion by sending an explanatory letter (Appendix 3) to various educational establishments in Sunderland. There is the obvious difficulty when collecting data of the true representativeness of it and therefore the initial approach was made to all relevant institutions. These were Sunderland Polytechnic, the 2 Tertiary Colleges Monkwearmouth College and Wearside College, the 17 secondary schools and 10 private training establishments - 30 institutions in total (Appendix 4). The letters were accompanied by pre-paid post cards to be returned indicating the willingness of the organisation to assist.

The details of those participating in the research are outlined in Appendix No 6. Initially there were 11 replies offering to help in the research. This gave an overall percentage reply of 36%.

The return rate was disappointing and a second follow-up letter was sent to the non-respondents (Appendix 5). The second letter elicited 6 additional offers of help bringing the percentage replies to 56%.

It was planned to make at least 3 visits to each of the 17 educational establishments. The first visit was designed to establish a relationship with a personal contact and to gain certain quantitative data as to lecture/teacher/trainer expertise and qualifications (see Appendix 7), hardware/software utilisation (see Appendix 8 and Courses offered (see Appendix 9).

The second visit would be designed to elaborate on information already received and to gain more qualitative data from the business studies personnel. The third visit would be concerned with the "learners" themselves and would include classroom observation and a collection of both subjective and objective data from the learners. A timetable of visits made to each establishment is given at Appendix 10.

Following the initial visit to each of the 17 educational establishments it was necessary to exclude 2 of these from further research because one proved to be, to all intents and purposes, an actual company rather than a training establishment and the second was specifically geared to training for retail outlets.

Although a variety of methods were used for the overall collection of the information during the initial contact visit to each of the 15 participating establishments 3 questionnaires were completed as follows:

1 IT in the Business Studies curriculum - Teacher/lecturer/trainer background information. (Appendix 7)

2 IT in the Business Studies curriculum - Equipment details (Appendix 8)

3 IT in the Business Studies Curriculum - Course details. (Appendix 9)

Questionnaires were used at this point in order to gain a substantial amount of quantitative data. It was felt that this method was relevant because questionnaires have the advantage of being cheap to administer, can be used for volume and are relatively easy to analyse.

The second visit to each establishment involved interviews with tutors in order to consolidate on the emerging data from the questionnaires and gain a more detailed insight into the role of information technology in the business studies curriculum. These interviews with teaching staff elicited further qualitative data. The biggest advantage of this data collection method is its adaptability. Interviews can consist of structured or pre-set questions or totally unstructured questions. The semi-structured type of

interview was thought to be the most appropriate so that previously developed analytical themes from the questionnaires would receive greater clarification (Appendix 11). There were disadvantages to overcome. This is a time-consuming activity and a very subjective technique. In the first instance there was the problem of where to conduct the interviews because of the differing data which could emerge from different environments. However because of the numbers of interviews involved and the problems of timetabling (interviewer and interviewees!) together with transportation problems the interviews were conducted at the premises of the educational establishment concerned.

Researchers debate as to whether the interviewer and interviewee should sit facing each other, because people talk more freely and fluently that way, or, as Stenhouse prefers, to sit side by side. Stenhouse's practice, to enhance a feeling of confidence and trust was adopted for the conduct of the interviews. Stenhouse prefers using a tape recorder to protect the interviewer against misrepresentation and because it captures the vividness of speech. Simons (1978) also favours recording but admits that it can be intrusive. According to Walker (1985) - tape-recording and note-taking are more different than they at first seem because they imply a different relationship. He feels that note-taking draws the researcher into

interpretation early in the study. The data emerging from the semi-structured questions (Appendix 18) during the interview sessions were tape-recorded where possible and fell into 5 categories ie

Communication

Management

Methodology

Learners

Assessment/Evaluation

For the purposes of this inquiry the third visit involved data collection of 2 types. Firstly of the qualitative type where pupils/students/trainees were observed in the practical IT aspect of the business studies curriculum in order to ascertain more precisely the extent of information technology in the curriculum. Walker's example (1985) was followed when he investigated the work of school inspectors by observing them at work in the "day of the life" kind. According to Stenhouse (1982), "this observation is not in the classic sense participant observation though superficially it has a participant appearance!" This technique was used to "go where the action is" in order to provide ecological validity. In other words the research took place in natural settings not laboratory conditions. This had obvious advantages in that it can be seen at first hand how IT was represented in the business studies curriculum, but there were disadvantages, or problematic

areas, which had to be borne in mind. The first of these was the basic problem of whether the Case studies research approach was a valid technique, as far as this particular issue was concerned.

According to Kenny and Grotelueschen (1984) one of their strategies for using a case study is that "it is more appropriate". On the other hand Walker (1983) gives "three good reasons for not doing case studies in curriculum research. "Case study research is an intervention and often an uncontrolled intervention in the life of others, provides a biased view, a distorted picture of the way things are and is essentially conservative". However he qualifies this by posing the question "but are these enough for not doing it?" The justification for using this approach was to follow the advice of Shaw (1978) in that "Representativeness is the key" and Stenhouse (1988) "case studies offer a truth at a particular time under particular circumstances". Hence the results of this inquiry will be illuminative rather than generalizable.

Prior to the actual observation the advice of Johnson (in Bell et al 1984) was followed ie in order to be as unobtrusive as possible details of all the people in the "observable areas" was obtained. Then there was the question of the timescale involved. How much time would be considered to be indicative of a true representation of a

classroom situation? Bearing in mind the constraints, a decision was made to observe in all those educational/training establishments who had agreed to participate in the research. The actual time spent in each establishment varied but usually followed the class period of tuition varying from a 35 minute period in a secondary school to a 2-hour block in the tertiary sector.

There was then the question of immersion into the observational area to minimise influencing the data. This problem was again alleviated at the 'homework' stage by explaining fully to those involved the purposes of the research prior to the observation.

This lead to a consideration of how to collect the observations. As the fundamental task of the observer is said to be the taking of fieldnotes, and copious note-taking may appear off-putting to those observed this problem was minimised by designing timed checklists which required the minimum of input and also to focus on the issues of interest - McIntyre (in Morrison 1972) "Only by recognising that he must ignore much that is happening and by focusing on carefully selected and pre-defined facets of classroom activity can the observer hope to avoid a subjectivity of which he cannot himself be aware".

Additionally the skill of shorthand notetaking was utilised

in this context to note behavioural cues and this was supplemented by a cross-referenced filing system to keep track of developing theoretical issues.

Also on the third visit the learners were issued with a lengthy questionnaire to complete (Appendix 12) and this was completed by 424 learners thus achieving valuable objective data about the learners' perceptions of information technology in the business studies curriculum.

Throughout the whole of the inquiry period all ad hoc data was recorded in the form of analytical memos, suitably cross-referenced, because as far as the data bank is concerned, the "researcher must be responsible for the investigation he/she has undertaken even if he/she is never called upon to render that account" - Johnson In J Bell et al (1984).

Stenhouse (1982) has a wry comment on this point "the problems of record-keeping are less a matter of sensitivity than of efficiency. It is on them that the plans of many case study researchers are wrecked!" On the same topic, and to be taken as a word of warning, Walker (1985) states that it is important not to lose sight of the intent and purpose of the project or to design complex and demanding research or evaluation studies that might drain energy better put to other purposes!" These points were borne in

mind throughout the period of the research and particularly at the stage of implementation which is described in the Chapter 3 "Research Evidence".

CHAPTER 3 - RESEARCH EVIDENCE

All relevant education/training establishments within Sunderland were initially contacted to participate in this research as follows:

1 Higher Education establishment

2 Tertiary Colleges

16 Secondary Schools

10 Private Training Agencies (see Appendix 4).

Both the Colleges in the tertiary sector and the Polytechnic from the Higher Education sector agreed to participate in the research. Seven of the 16 Secondary schools agreed to participate giving a percentage response rate from this sector of 43%. Seven of the 10 Private Training Agencies agreed to participate in the research giving a percentage response rate from this sector of 70%. Overall, from initial requests to 29 institutions, 17 agreed to participate in the research giving an overall percentage response rate of 58%. However 2 of these institutions were not used because of reasons cited earlier. Further details of the Institutions who took part in the research are given at Appendix 6.

The resulting data, the collection of which has been outlined in Chapter 2, has been categorised into general areas as follows:

a Tutor expertise
b Hardware/software
c Courses
d Methodology
e Learners.

The evidence will be detailed under these headings in this chapter.

TUTOR EXPERTISE

It was interesting, in the first instance, to gain a preliminary insight into the background of the people who are ultimately responsible for delivering information technology in the business studies curriculum in view of the relative "newness" of the subject. The initial questionnaire (Appendix 7) was completed by 70 lecturers/teachers/trainers/tutors. These tutors indicated their "designation" to be as follows:

TABLE NO 9

EXTRACTED RESULTS OF QUESTIONNAIRE - TEACHER/LECTURER/TRAINER BACKGROUND INFORMATION (APPENDIX 7)

DESIGNATION	%
LECTURER	38.0
TEACHER	25.4
TRAINER	12.7
TUTOR	16.9

The full results of the questionnaire are detailed in Appendix 13 but the key facts are reported here. Overall 40% of the tutors had been teaching for over 10 years and 60% 10 years or less. (see Table 10 below).

TABLE NO 10
EXTRACTED RESULTS OF QUESTIONNAIRE - TEACHER/LECTURER/TRAINER - BACKGROUND INFORMATION (APPENDIX 7)

		%
GENERAL "TEACHING" EXPERIENCE	20 YEARS OR OVER	9.9
	15-19 YEARS	9,9
	10-14 YEARS	19.7
	5-9 YEARS	28.2
	4 YEARS OR LESS	31.0

The data reveals that those employed in the private educational sector in Sunderland had far less general teaching experience than their colleagues in the secondary and tertiary sectors.

TABLE NO 11
EXTRACTED RESULTS OF QUESTIONNAIRE -
TEACHER/LECTURER/TRAINER BACKGROUND INFORMATION
(APPENDIX 7)

YEARS OF TEACHING EXPERIENCE

	OVER 20	15-19	10-14	5-9	4 YRS OR LESS
TERTIARY	12.9	12.9	25.8	32.3	16.1
SECONDARY	13.0	13.0	21.7	26.1	20.1
PRIVATE	-	-	6.3	25.0	68.8

However, although those from the tertiary and secondary sector had extensively more general experience there was little measurable difference between the sectors of their IT teaching experience.

TABLE NO 12

EXTRACTED RESULTS FROM QUESTIONNAIRE
TEACHER/LECTURER/TRAINER BACKGROUND INFORMATION
(APPENDIX 7)

SPECIFIC IT TEACHING EXPERIENCE

	OVER 20	15-19	10-14	5-9	1-4	LESS THAN 1 YEAR
TERTIARY	6.5	6.5	3.2	32.3	41.9	6.5
SECONDARY	-	-	4.3	26.1	60.9	8.7
PRIVATE	-	-	-	18.8	62.5	18.8

Overall 63.4% of those surveyed had less than 5 years IT teaching experience. The majority from each sector had

between 1-4 years teaching experience ie 41.9% of those from tertiary, 60.9% from those from secondary and 62.5% of those from the private sector. It was not possible to ascertain from the data how each tutor perceived "IT teaching experience" and it may have been the case that those who indicated lengthy experience may, in fact, have been referring to "computer teaching experience" rather than "information technology teaching experience".

Overall 64.8% of the tutors had a Degree (see Table 13 below).

TABLE NO 13

RESULTS OF QUESTIONNAIRE - TEACHER/LECTURER/TRAINER BACKGROUND INFORMATION (APPENDIX 7)

QUALIFICATIONS	
DEGREE	64.8
CERTIFICATE IN EDUCATION	42.3
TEACHERS' CERT IN OFFICE STUDIES	11.3
TEACHING DIPLOMA IN COMPUTING/IT	4.2

A breakdown between sectors reveals that more lecturers from the tertiary than any other sector possessed a Degree (52.2%). In the private sector only 13% possessed a degree and 10% a Certificate in Education (see Table 14 below).

TABLE NO 14
EXTRACTED RESULTS FROM QUESTIONNAIRE
TEACHER/LECTURER/TRAINER BACKGROUND INFORMATION
(APPENDIX 7)

QUALIFICATIONS (IN PERCENTAGE TERMS)

	DEGREE %	CERT ED %	OFF STUDIES %	DIP COM %
TERTIARY	52.2	46.7	50.0	33.3
SECONDARY	34.8	43.3	37.5	33.3
PRIVATE	13.0	10.0	12.5	33.3

Although more tutors from tertiary than any other sector possessed an Office Studies Certificate it was interesting to note that all 3 sectors indicated that only a third of their tutors possessed a Diploma in Computer Studies.

Fifty percent of respondents indicated that they had undertaken staff development in IT at a Polytechnic, The second highest number of tutors undertaking staff development in IT was in-house (40.6%). Few respondents (1.4%) had undertaken IT staff development with manufacturers (Table 15 below).

TABLE NO 15
EXTRACTED RESULTS OF QUESTIONNAIRE -
TEACHER/LECTURER/TRAINER BACKGROUND INFORMATION
(APPENDIX 7)

PERCENTAGE OF TUTORS WHO HAVE UNDERTAKEN STAFF DEVELOPMENT IN IT ANALYSED BY ESTABLISHMENTS

	%
Staff Development undertaken in a Polytechnic	50.7
Staff Development at College	31.9

Staff Development at School	18.8
Staff Development with Manufacturers	1.4
Staff development in-house	40.6
Staff development in industry	18.8

This data has been further categorised to show instances of staff development according to educational sector (Table 16 below).

TABLE NO 16

EXTRACTED RESULTS FROM QUESTIONNAIRE
TEACHER/LECTURER/TRAINER BACKGROUND INFORMATION
(APPENDIX 7)

STAFF DEVELOPMENT UNDERTAKEN IN IT (ACTUAL NUMBERS)

	POLY	COLL	SCH	MAN	IN HOUSE	INDUSTRY
TERTIARY	19	14	1	1	8	8
SECONDARY	10	5	12	0	10	3
PRIVATE	6	3	0	0	10	2

Although the call for appropriate staff development in IT is well documented it appears from the interviews with tutors that it is organised on a fairly unstructured basis in Sunderland (see Table 17 below). There was little evidence of any researched programme of staff development in IT and could best be described as a "bottom-up approach".

TABLE NO 17
EXTRACTED DATA FROM INTERVIEW WITH TUTORS (APPENDIX 18)

	"WHO IS RESPONSIBLE FOR STAFF DEVELOPMENT IN IT AND HOW IS IT ORGANISED?"
TERTIARY	
1	Assistant Head of Dept for staff development generally.
2	Staff development tutor generally.
3	On a School basis - ad hoc - probably organised by Staff Development tutor.
SECONDARY	
4	ITAC Co-ordinator, Head of IT but priority not there for IT - no response - pupils teach teachers
5	head of Maths Dept - Business studies for Amstrad training
6	Head of IT/also TVEI Co-ordinator In-service training days - after school as a result of requests from staff - very informal
7	Head of Computing Studies
8	Computer available for use. In-service training days and on an ad hoc basis
13	Head of IT - in-service sessions - a computing room available to try things out
PRIVATE	
9	Manager - no policy but if staff indicate an interest then it will be organised.
10	Staff training remit of the Manager but IT from trainer
14	Manager of the Centre but Head Office offers updating courses at centres around the country
16	Management/staff ask/make recommendations
17	IT tutor - staff are invited onto commercial courses - sit in with groups. Tutors are encouraged to use the facilities

The commercial/industrial experience generally of the respondents highlighted from the questionnaire (Appendix 7) is given in Table 18 overleaf.

TABLE NO 18

EXTRACTED RESULTS OF QUESTIONNAIRE -
TEACHER/LECTURER/TRAINER BACKGROUND INFORMATION
(APPENDIX 7)

		%
COMMERCIAL/INDUSTRIAL EXPERIENCE	10 YEARS OR OVER	46.5
	5 YEARS OR OVER	18.3
	1 YEAR OR OVER	11.3
	6 MONTHS - 1 YEAR	2.8
	3 months - 6 months	5.6
	none at all	14.1

This can be analysed between the 3 sectors as follows:

TABLE NO 19
EXTRACTED RESULTS OF QUESTIONNAIRE -
TEACHER/LECTURER/TRAINER BACKGROUND INFORMATION
(APPENDIX 7)

AMOUNT OF INDUSTRIAL EXPERIENCE

	> 10 YRS %	> 5 YRS %	>1 YR %	6M-1YR %	3-6MTHS %	NONE %
TERTIARY	22.5	12.7	4.2	1.4	-	2.8
SECONDARY	11.3	4.2	6.6	1.4	2.8	7.0
PRIVATE	12.7	1.4	1.4-	-	2.85	4.2

Therefore minimal percentages of tutors from the tertiary (4.2%) had less than 1 years industrial experience. The figure is slightly higher for the private sector (7%) but the highest incidence of less than 1 years industrial experience is from the secondary section (11.2%).

There was little evidence, from the interviewed tutors, of any links with industry as far as development in IT was

concerned on the business studies courses. The learners themselves, in the main, "discovered" progress in IT in industry through private assignment/research work or through works experience (see Table 20 below).

TABLE NO 20
EXTRACTED DATA FROM INTERVIEW WITH TUTORS (APPENDIX 18)

	"WHAT LINKS ARE THERE WITH INDUSTRY AS FAR AS IT IS CONCERNED?"
TERTIARY	
1	None
2	None as a College
3	None - works experience indicated that similar software was encountered.
SECONDARY	
4	Nissan - but they are back-peddling now. Flexible learning centre - Enterprise Centre
5	Pupils find their own links for assignment work.
6	Works experience - incidental whether IT
7	None
8	None direct. However pupils undertake work related project for GCSE
13	Use of Enterprise centre
PRIVATE	
9	Linked through work placement
10	No official links
11	
12	
14	None apart from placement where they try to copy their software
16	Small companies in the area, larger firms in Scotland and Yorkshire
17	

HARDWARE/SOFTWARE

The interview with tutors (Appendix 18) revealed that the ratio of computers to business studies students throughout the region was generally on a one to one basis (see Table 21 below).

TABLE NO 21
EXTRACTED DATA FROM INTERVIEW WITH TUTORS (APPENDIX 18)

"WHAT IS THE AVERAGE RATIO OF HARDWARE/SOFTWARE PER STUDENT?

TERTIARY

1	1:1
2	2:3
3	1:1

SECONDARY

All participating secondary schools indicated computers on a ratio of 1:1 apart from one which was reported as 1:20.

PRIVATE

All participating private training agencies indicated computers on a ratio of 1:1

However the learner's questionnaire (Appendix 12) indicated that 42% had had to share a computer at some point; although this was more prevalent in the tertiary sector ie 50.9%.

Fifty one percent of respondents to the learners questionnaire (Appendix 12) had access to a computer at home. Analysed by gender this proved to be 39.9% female and 60.1% male.

Only 14.6% had a computer at home which was compatible with the one used in their educational establishment. Table 22 shows the percentage of students with compatible computers divided by sector and indicating gender.

TABLE NO 22
EXTRACTED DATA FROM QUESTIONNAIRE TO LEARNERS
(APPENDIX 12)

THE OVERALL PERCENTAGE OF LEARNERS (14.6%) WHO HAVE A COMPUTER AT HOME WHICH WAS COMPATIBLE WITH THE ONE ON THEIR COURSE ANALYSED BY EDUCATIONAL SECTOR	
TERTIARY	15.5%
SECONDARY	16.1%
PRIVATE	12.0%
THE OVERALL PERCENTAGE OF LEARNERS (14.6%) WHO HAVE A COMPUTER AT HOME WHICH WAS COMPATIBLE WITH THE ONE OF THEIR COURSE ANALYSED BY GENDER.	
MALE	52.2%
FEMALE	47.8%

There was therefore no significant difference from which sector these respondents were from but the gender issue could be significant in that it indicates that females more than males appeared to be more aware of the relevance of having a computer at home which was compatible with the one in their educational institution.

However, twice as many of those who did have a compatible computer at home appeared to use it more than the median time of 1 hour (see Table 23 below).

TABLE NO 23
EXTRACTED DATA FROM QUESTIONNAIRE TO LEARNERS
(APPENDIX 12)

NUMBERS OF LEARNERS WHO HAVE A COMPATIBLE COMPUTER AT HOME TO SHOW TIME SPENT ON THE COMPUTER AT HOME REPRESENTED ABOVE/BELOW MEDIAN OF 1 HOUR

	NOS OF STUDENTS WITH COMPATIBLE COMPUTER
GT MEDIAN	27
LE MEDIAN	14

However of the 17.6% overall who used any computer at home for more than 5 hours a week 15.1% were male!

The reaction of learners by sector as to enjoyment of using computers generally is shown in Table 24 below.

TABLE NO 24
EXTRACTED DATA FROM QUESTIONNAIRE TO LEARNERS (APPENDIX 12)

ENJOYMENT OF COMPUTERS GENERALLY ANALYSED BY SECTOR

	ITS GREAT %	ITS OK %	NOT AT ALL %
TERTIARY	35.3	56.9	7.8
SECONDARY	48.5	50.8	0.8
PRIVATE	32.0	64.8	3.3

The secondary sector seemed to indicate a more positive attitude to the use of computers. It may be relevant therefore to point out that this sector has more access to computers at home.

TABLE NO 25
EXTRACTED DATA FROM QUESTIONNAIRE TO LEARNERS (APPENDIX 12)

ACCESS TO COMPUTERS AT HOME
%

TERTIARY 43.1 SECONDARY 63.4 PRIVATE 46.3

The Table below analyses the issue of access to a computer at home by gender, between the educational sectors.

TABLE NO 26
EXTRACTED DATA FROM QUESTIONNAIRE TO LEARNERS (APPENDIX 12)

ACCESS TO COMPUTER AT HOME ANALYSED BY EDUCATIONAL SECTOR AND GENDER

	TERTIARY %	SECONDARY %	PRIVATE %
MALE	16.8	32.1	28.1
FEMALE	26.3	31.3	16.2

There appears to be a reversal of trends between the tertiary and private sectors ie in the tertiary sector 10% more females than males have access to a computer at home whereas in the private sector the opposite is the case. However in the secondary sector, who have been perceived to generally enjoy computers more (see Table 26 above) there are an equal number of males and females with access to a computer at home.

The personal interviews with tutors (see Table 27 below) revealed that the decision as to which hardware to purchase was, in the main, made by a Head of Department or Manager.

TABLE NO 27
EXTRACTED DATA FROM INTERVIEW WITH TUTORS (APPENDIX 18)

WHO DECIDES ON THE PURCHASE OF HARDWARE/SOFTWARE?

TERTIARY

1 IT Tutor/Assistant Head of Department
2 Head of Faculty/Head of Schools
3 Management in consultation with staff

SECONDARY

5	Head of Department
6	Head of Department
7	LEA
8	LEA Advisor for hardware and Head of Department for software
13	Head of Department
PRIVATE	
9	Manager
10	Trainers say what is needed - someone else decides on cost
14	Head Office for hardware - software the Manager
16	Ass Manager - requirements of outside organisations and suggestions from staff

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The reasons given for choosing a particular type of hardware were mainly twofold "cost" and "on recommendation". (For other reasons see Table 28 below).

TABLE NO 28
EXTRACTED DATA FROM INTERVIEW WITH TUTORS (APPENDIX 18)

ON WHAT BASIS ARE THESE DECISIONS MADE?	
TERTIARY	
1	cost
2	-
3	-
SECONDARY	
4	-
5	cost/user friendly/recommendations from colleagues in other schools.
6	cost and relevance to the courses
7	LEA
8	Recommendations from those who have tried.
13	Price, technical support, use in other establishments.
PRIVATE	
9	cost - industry/commercial standards
10	The requirements of the course - new developments in IT

Interviewed tutors said there was no specific budget for IT, more generally there existed a budget for Business Studies out of which IT had to be financed (see Table 29 below).

TABLE NO 29
EXTRACTED DATA FROM INTERVIEW WITH TUTORS (APPENDIX 18)

	"IS THERE ANY SPECIFIC BUDGETARY CONTROL FOR IT PROVISION?"
TERTIARY	
1	No, bids are just put forward for IT.
2	No provision specifically for IT
3	Yes
SECONDARY	
4	Head controls budget but very receptive to requests.
5	Try to get funds from TVEI - No
6	Each Department has a budget
7	Not aware of any - TVEI influences
8	Each Department has a budget
13	Included in business studies budget
PRIVATE	
9	No
10	Yes - budget worked out 12 months in advance
14	Yes
15	
16	Yes - budget for Borough Tecs
17	No

As outlined in Appendix 15 only the tertiary establishments and one private training establishment possess IBM computers. The higher educational establishment, one tertiary and 3 private training establishments possess IBM compatible machines. Amstrad 8256 is very popular for the teaching of business studies in the Schools. All 7 schools have these machines. Three out of 5 of the private training establishments also have these machines. Six out of the 7 schools also have Nimbus networks but these are used mainly for computing work generally not for Business Studies. Only one establishment, a tertiary College, has BBC computers (Appendix 15).

Although all establishments have dot matrix printers only 1 tertiary has a daisy wheel printer and the higher education establishment, 1 tertiary and 1 private training establishment have laser printers (Appendix 15).

A review of developments in software applications was undertaken in the various stages of data collection.
The learner's questionnaire (Appendix 12 and Table 29 below) indicated that by far the most popular piece of software - in terms of use and 'enjoyment' - used in Sunderland on business studies courses is word processing. Overall it was used by 92.9% of learners and said to be enjoyed by 88.5% of them. Table 30 shows these figures divided by educational sector.

TABLE NO 30
EXTRACTED DATA FROM QUESTIONNAIRE TO LEARNERS (APPENDIX 12)

USE AND ENJOYMENT OF SOFTWARE APPLICATIONS

	USE OF WORD PROCESSING (92.9% overall)	ENJOYMENT OF WORD PROCESSING (88.5% overall)
TERTIARY	41.3%	39.6%
SECONDARY	28.7%	30.7%
PRIVATE	30%	29.6%

It appeared that the actual brandname of the software used for this application (Appendix 16) was not relevant as many different kinds were quoted as being used. However the most popular word processing system in the Schools is Locoscript but the most popular system overall

is Wordstar. It is used in 4 private training establishments, 1 school and the higher educational establishment. The second most popular word processing system overall was Wordperfect which was used in 3 private training establishments and 1 of the tertiary Colleges. Third in popularity was Multimate which was used in 1 tertiary and 1 private training establishment (Appendix 15). In many establishments the learners had recognised the importance of the benefits of word processing for assignment work.

The learner's questionnaire (Appendix 12) also revealed that, overall, 78.3% used databases on their courses; 49.8% of those who used it, enjoyed using it. The division of these percentages into educational sectors reveals a sharp drop in the numbers of learners from the secondary sector who use, and therefore have an opportunity to enjoy, database application.

TABLE NO 31

EXTRACTED DATA FROM QUESTIONNAIRE TO LEARNERS (APPENDIX 12)

USE AND ENJOYMENT OF SOFTWARE APPLICATIONS

	USE OF DATABASES	ENJOYMENT OF DATABASES
TERTIARY	50.7%	49.8%
SECONDARY	16.4%	18.7%
PRIVATE	32.9%	31.5%

The actual business education market in Sunderland appears to be monopolised by various versions of the database software brandname "Dbase" (see Appendix 14).

It can be seen from the extract of results in Table 32 below that from the 77.1% of respondents who use spreadsheets on their business studies courses generally there are significantly more from the tertiary sector (54.9%). In the secondary sector only 19.3% used spreadsheets although 17.3% from this sector indicated that they enjoyed using them. The difference between the various spreadsheet software was irrelevant being mainly Lotus 123 or a lookalike (Appendix 15).

TABLE NO 32
EXTRACTED DATA FROM QUESTIONNAIRE TO LEARNERS (APPENDIX 12)

USE AND ENJOYMENT OF SOFTWARE APPLICATIONS

	USE OF SPREADSHEETS	ENJOYMENT OF SPREADSHEETS
TERTIARY	54,9%	51.3%
SECONDARY	14.3%	17.3%
PRIVATE	30.8%	31.4%

Supercalc was the most popular spreadsheet, being used in 2 schools and 4 private training establishments. Lotus 123 was more popular in tertiary (2 establishments) and was also used in 1 private training establishment (Appendix 15). Other spreadsheets in use were VP Planner, Multiplan and As Easy As.

Integrated software was used in few secondary schools, 6.8%. Of the 28.1% overall response indicating the use of

integrated software, 67% were in the tertiary sector and 61.5% of those who enjoyed using it were from the tertiary sector. Twenty six point one of those who used it were therefore from the private sector. Although Mini Office Professional was very popular in Schools there was no popular system overall. Those mentioned included First Choice and Ability, both used in the tertiary sector (Appendix 15).

Other, but much less predominant software applications, used in the business studies curriculum of Sunderland are desk top publishing, used by 29.5% but, surprisingly 50.5% of this was in the secondary sector (Table 33 below).

TABLE NO 33
EXTRACTED DATA FROM QUESTIONNAIRE TO LEARNERS (APPENDIX 12)

USE OF DESK TOP PUBLISHING ON BUSINESS STUDIES COURSES

	USE OF DTP ON COURSE %	ENJOYMENT OF DTP %
TERTIARY	20.0	22.0
SECONDARY	50.5	51.0
PRIVATE	29.5	27.0

Two schools used Newsdesk and the higher educational establishment used Harvard Graphics/Ventura. Others mentioned in the survey were Newsmaster, Microdesign, DTP, Stop Press, Timeworks, Pagemaker and First Publisher (Appendix 14).

Although the variety of software applications has advanced rapidly the results of the learners questionnaire (Appendix 12) revealed there was very little use being made of business games (15%) or accounts software (16.6%). However these types of software were mainly used in the tertiary and private sector. Accounts software was only used by 9.6% of learners in the secondary sector.

Thirty point eight percent of learners indicated that they did programming on their courses. Of this figure 39.2% were from the private sector, 38.2% from the secondary sector and 22.5% from the tertiary sector.

It was interesting to note that out of all the software mentioned by the learners there was definite evidence of females enjoying all the software more than the males with 2 important exceptions, ie accounts software and programming (see Table 34 below).

TABLE NO 34
EXTRACTED DATA FROM QUESTIONNAIRE TO LEARNERS (APPENDIX 12)

ENJOYMENT OF SOFTWARE APPLICATIONS ANALYSED BY GENDER

	MALE %	FEMALE %
WORD PROCESSING	35.4	64.6
SPREADSHEETS	39.8	60.2
DATABASES	37.3	62.7
INTEGRATED PACKAGES	41.5	58.5
DESK TOP PUBLISHING	56.0	44.0
ACCOUNTS	56.4	43.6
PROGRAMMING	61.9	38.1

As far as fifth generation computing is concerned the learners questionnaire results (Appendix 12) revealed that there appears to be little advancement, only 19.4% learners had used electronic mail. The interview situation with tutors revealed little use of Computer Assisted Learning (see Table 35 below).

TABLE NO 35
EXTRACTED DATA FROM INTERVIEW WITH TUTORS (APPENDIX 18)

"DO YOU USE ANY FORM OF CAL/IV?"	
TERTIARY	
1	Research assistant doing a Phd on CAL but it has not been diffused into the Department - MBA use CAL on the Accounting course
2	No
3	IV
SECONDARY	
4	in another Dept CAL partly
5	Teach Yourself Supercalc 2 - but not impressed - a little complicated for pupils
6	No
7	No
8	No
13	No
PRIVATE	
9	No
10	No
14	Yes

This would further indicate that computer assisted learning has not made any advance in the business studies curriculum of educational establishments within Sunderland Tyne and Wear where the tutor is very much still in evidence (Appendix 19).

UNIV DUNELM

The development in electronic communications does not appear to have permeated into use by Business Studies learners in Sunderland being limited to fax machines and an electronic mail link with the Council offices at the Civic Centre - for staff use only (Appendix 18). In the learners questionnaire (Appendix 12) 19.4% of learners indicated they used electronic mail on their course. Of these 50% were tertiary, 21% secondary and 29% from the private sector.

COURSES

There was no obvious evidence from the interview situation (see Appendix 17) of any attempt in any educational establishment to relate the software applications used to the level of the learners ability/age and so alleviate the problems of encountering the same software in the different levels of the educational sectors (see Table 36 below).

TABLE NO 36
EXTRACTED DATA FROM INTERVIEW WITH TUTORS (APPENDIX 18)

"IS THERE ANY COMMUNICATION BETWEEN YOUR ESTABLISHMENT AND THE LEARNERS' PREVIOUS EDUCATIONAL ESTABLISHMENT TO ASCERTAIN PRE-ENTRY BEHAVIOUR IN IT?"	
TERTIARY	
1	No apart from access courses from Colleges - we have given them an indication of what we need and if they could give us a profile this would be good.
2	No apart from headteachers report.
3	Headmasters report or from the student themselves
SECONDARY	
4	No - treat them all as if they knew nothing because of differences in calibre from feeder schools
5	Lower years do 35 minutes a week but practically start from scratch when they come to us.
6	No
7	No
8	Head of first year develops general links with feeder schools
13	Nothing formal
PRIVATE	
9	No - they come from school and we don't have access to school records.
10	Ask new trainees - should be a report from school or previous YTS.
14	No
16	Nothing specific - School references/career services
17	None except to ask them

Or indeed was there any evidence of any establishment seeking specific information on the IT skills from the learners previous educational establishment (see Table 37

below).

TABLE NO 37
EXTRACTED DATA FROM INTERVIEW WITH TUTORS (APPENDIX 18)

	"IS THERE ANY COMMUNICATION BETWEEN YOUR EDUCATIONAL ESTABLISHMENT AND THE LEARNERS' DESTINATION TO ACQUAINT THEM WITH THEIR IT EXPERTISE?"
TERTIARY	
1	They usually go directly into employment. When they go out on work placement (for one year) they know what they need to know. Employers expect IT literacy.
2	No apart from reference from tutor or B/tec grade.
3	Possibly Records of Achievement
SECONDARY	
4	Records of Achievement
5	Specific qualifications
6	No
7	Not specifically - careers teacher may.
8	Head of careers/Colleges ask for reports on students.
13	Informally when requested.
PRIVATE	
9	If its their placement which turns into employment then very much.
10	No
14	Work placement - yes
16	Yes we contact College/Works experience so that ITEC can keep in touch with the real world.
17	No

It can be seen from the foregoing Tables that there appears to be very little communication between educational establishments in Sunderland to take advantage of continuity in levels of IT expertise in the learners. The general feeling is that each sector assumes the learners have had no previous IT experience at all which is obviously not the case. The only progress which appears to being made in this direction is through Records of Achievement being developed in the secondary sector.

The tutors from the tertiary and private sectors were fairly critical, in the interview situation (Appendix 18),

of the IT expertise and attention span of pupils joining them from the secondary sector. Tutors from the private sector indicated that the pupils at first tended to be blase about their perceived ability until it became clear to them that they had a lot to learn, particular as regards "real" business software.

The learners questionnaire revealed that 56.2% of them expected to go on to employment when they finished their present course. A fairly equal number from tertiary and private ie 43% and 46% respectively. Only 10% of those leaving the secondary sector expected to become employed. Only 14.6% of all learners indicated that they expected to go on to College; these were mostly from the secondary sector.

Few institutions have a definite IT policy statement (Appendix 18) although moves in this direction appear to be being made. Determining factors behind decisions as to courses are usually influenced by the LEA in the case of Schools, TEC's in the case of private training establishments and the HMI in the case of tertiary. Other guidelines/policies adhered to in IT decision making were said to be TVEI, the DES and particular named industries.
The learners questionnaire (Appendix 12) indicated that 72.6% of the respondents looked forward to using a computer after they finished their present course. A Table (see 38 below) showing this information analysed by educational

sector and gender, is given below.

TABLE NO 38
EXTRACTED DATA FROM QUESTIONNAIRE TO LEARNER (APPENDIX 12)

EXPECTATION OF LEARNER USE OF A COMPUTER FOLLOWING BUSINESS STUDIES COURSE ANALYSED BY EDUCATIONAL SECTOR AND GENDER

	OVERALL %	MALE %	FEMALE %
TERTIARY	72.9	21.1	51.8
SECONDARY	70.6	35.7	34.9
PRIVATE	74.8	31.9	42.9

Predominently more females from the Tertiary and Private sector looked forward to using a computer when they left their present educational establishment. There was no obvious difference according to gender from those in the secondary sector.

It was indicated in the previous section that decisions as to which courses are offered are very much autocratic being made by a Head of School/Head of Department. A notable exception to this is in a private training establishment where the decision is made as a "team".

As far as specific courses in Business Studies are concerned the various educational establishments offer very similar courses eg the secondary sector is dominated by GCSE Business Studies and the RSA Clait examination (see Appendix 17). The private sector are more aware of current educational trends and are ahead of the tertiary sector in adopting the new NCVQ accredited Business Administration courses at Level I and II, validated by a variety of

external examining bodies eg Pitman, LCC and RSA. The tertiary sector is monopolised by a variety of B/TEC and secretarial courses at varying levels (Appendix 17). Although the majority of establishments claimed during the interviews that IT was integrated, or in the process of being integrated, into the Business Studies curriculum (see Table 39 below) there was little evidence of this during the observation period.

TABLE NO 39
EXTRACTED DATA FROM INTERVIEW WITH TUTORS (APPENDIX 18)

"IS INFORMATION TECHNOLOGY TAUGHT AS A SEPARATE SUBJECT OR INTEGRATED INTO THE BUSINESS STUDIES CURRICULUM?"	
TERTIARY	
1	Metamorphosis - process of getting there
2	First Course yes - National No
3	Partly integrated - fully integrated with NCVQ
SECONDARY	
4	Integrated
5	Integrated
6	Integrated
7	No
8	Yes
13	Yes
PRIVATE	
9	Towards integration
10	No
14	Integrated
16	Integrated

The anomaly appears to arise from the apparent misunderstanding of the definition of "integrated". The perception of the tutors would seem to be that if the learners are involved with "business" type problems using the computer then this is integration. However every class observed had been "timetabled" separately as Information Technology or Information processing. If true integration

had been achieved there would have been no specific IT slot in the curriculum, the classes would have been merely timetabled in a room of computers for "business studies". The interviewed tutors indicated (Appendix 18) that courses were evaluated in a variety of ways, the most predominent of which was by success in external examinations, although individual centres mentioned other factors eg comparison between results of groups of students and subjective feelings but there was little evidence of formal evaluation procedures.

TABLE NO 40
EXTRACTED DATA FROM INTERVIEW WITH TUTORS (APPENDIX 18)

HOW IS YOUR COURSE(S) EVALUATED?	
TERTIARY	
1	
2	Overall results of exams/grades/team meetings at the end of the year.
3	Student success - constant monitoring
SECONDARY	
4	Not by exam results. Subjective feeling of pupils/staff. The first four weeks are all important.
5	Just follow the syllabus.
6	External examination results GCSE, CPVE initially.
7	None as yet
8	Analysis of results - pupils response - quality of the assignment.
13	Under constant evaluation
PRIVATE	
9	NCVQ is just in operation - Pitman now.
10	Talk to trainees afterwards. Compare groups particularly mixed ability. Perhaps change material or way of delivery.
16	Externally - number of people who get jobs and success in examinations.

In the IT component part of the courses, however, most educational establishments indicated that the percentage of IT input was "hands on" rather than theoretical (see Table 41 below).

TABLE NO 41
EXTRACTED DATA FROM INTERVIEWS WITH TUTORS (APPENDIX 18)

"WHAT PERCENTAGE OF THE IT INPUT ON THE COURSE IS HANDS ON?"	
TERTIARY	
1	-
2	-
3	100%
SECONDARY	
4	50% THEORY 50% practical
5	80%
6	100%
7	-
8	30%
13	50%
PRIVATE	
9	50%
10	95%
16	Quite a lot

The average ratio of staff to learner differed greatly according to the type of sector ie

1:10 private
1:15 tertiary
1:20 secondary
(Appendix 18)

The interview situation (Appendix 18) revealed that a similar amount of time was spent using a computer on business studies courses in the secondary sector and tertiary sectors. However a great deal more time, on average, appeared to be spent in this way on such courses in the private sector, in some cases as much as 20/25 hours a week. Learners indicated that overall 71.5% had a computer available to them in their free time in their establishment. The interviews revealed that in only one establishment out of 15 was a computer not available for student use in their free time.

The main form of assessment for IT throughout all sectors was claimed, during the interview sessions with tutors (Appendix 18), to be the submission of assignment work although for the most part they indicated that there was no specific assessment of the IT content of the assignment.

Interviewed tutors gave little evidence of any deliberate attempt to introduce self-assessment procedures for IT (Appendix 18). Ways in which this was said to have occurred unconsciously were, by learners comparing with their peers,(1 response) receiving instant feedback from practical work (5 responses) learners ticking off progress sheets (4 responses) simply from learners receiving back their marked work (1 response) and negotiation of profile sentences (2 responses).

The interviewed tutors (Appendix 18) revealed that the grading of IT skills was not generally recorded specifically except by the move towards Records of Achievement or grades from work placement.

TEACHING METHODOLOGY

The teaching methodology for IT in the Business Studies curriculum was found to be very similar in all 3 sectors (see Table 42 below).

TABLE NO 42
EXTRACTED DATA FROM INTERVIEWS WITH TUTORS (APPENDIX 18)

"WHAT IS YOUR MAIN TEACHING METHODOLOGY FOR IT?"	
TERTIARY	
1	Assignments
2	By assignments with tutor guidance/tutor led
3	Tutor prepared notes/hands on experience
SECONDARY	
4	student centred/work booklets
5	complete an idiots guide - work booklet for each piece of software
6	teacher led but very much hands on
8	work booklets/individual tuition
13	hands on - student centred - responding to individual needs
PRIVATE	
9	new topic teacher led then through RSA clait book
10	hands on - provision of workbooks
14	student-centred - individual assignments
16	hands on at the workstation
17	student-centred - rely heavily on being able to read - follow through workbooks

In the main this was from an instructor in the first instance followed by workbooks and assignments, very much as "hands on" practical experience. During observation of the practical classroom situation there was definite evidence of the necessity for a "teacher". This was particularly so in the secondary sector where the pupils

repeatedly asked the same question of the teacher over and over again. The main methodology seemed to be individual coaching with pupils vying for the attention of the teacher (Appendix 19). The response from the learners questionnaire on this aspect is given below (Table 43).

TABLE NO 43
EXTRACTED DATA FROM QUESTIONNAIRE TO LEARNERS (APPENDIX 12)

ACQUISITION OF IT EXPERTISE ANALYSED ACCORDING TO EDUCATIONAL SECTOR

Overall 73.5% of learners indicated that they acquired their IT skills from an instructor.

Tertiary	43.3%
Secondary	30.3%
Private	26.5%

Overall 21.6% of learners indicated that they acquired their IT skills from a workbook.

Tertiary	18.5%
Secondary	34.3%
Private	47.1%

The IT content of the business studies courses in educational establishments in Sunderland would therefore still appear to be teacher-centred with little evidence of tutor's "managing" the learning. The private training agencies appeared to rely more heavily on workbooks.

Although more establishments, 7 as opposed to 5, indicated that specific keyboard training was given to maximise inputting speed (see Table 44 below), there was little evidence of this during observation (Appendix 19).

TABLE NO 44
EXTRACTED DATA FROM INTERVIEWS WITH TUTORS (APPENDIX 18)

"IS THERE ANY SPECIFIC KEYBOARD TRAINING GIVEN TO MAXIMISE INPUTTING SPEEDS?"

TERTIARY
1 No
2 No apart from WP
3 Yes most do keyboarding as an option
PRIVATE
4 No
5 No
6 Yes in third year an attempt is made
7 No not enough time
8 No
13 Keyboard familiarisation as a module.
PRIVATE
9 all trainees undertake keyboard training
10 Use typing tutors sometimes. Trainees only come to use the keyboard as a means to an end.
14 mask keys/computer program to aid keyboarding - easier if you havent typed before

In many establishments the physical environment was not ideal and many learners would have found it impossible to key in correctly. In many cases the computers were very tightly packed together and in 2 establishments learners were observed to be operating the keyboard on their laps (Appendix 19)! There were also numerous examples of students physically taking each others keyboards to key in work when their colleagues were having problems. This was a practice also noticed in the tutors eg when a student was in difficulty the tutor would tend to take over the keyboard to correct errors rather than explaining to the student where the error had been made and allowing the learner to "press the keys for himself" to rectify the mistake.

Most of the establishments claimed to cover the minimum aspects of health and safety with students (see Table 45 below), often during an induction period at the beginning of a course.

TABLE NO 45
EXTRACTED DATA FROM INTERVIEWS WITH TUTORS (APPENDIX 18) ANALYSED BY EDUCATIONAL SECTOR

WHAT HEALTH AND SAFETY ASPECTS OF IT ARE INCLUDED ON THE COURSES?	
TERTIARY	
1	Very little
2	very little - in the second year consequences of computerisation.
3	left to individual lecturers
SECONDARY	
4	VDU/dimmer - headaches
5	Induction - eye strain/radiation but we do not frighten Them - rest periods at work
6	Initial induction - machine handling/cable management
7	No
PRIVATE	
9	pupils complete a full module on heath and safety legislation etc.
10	Health and safety at the beginning of the course - electrical equipment and dangers of sitting at screen too long etc. Ergonomics
14	Induction - posture, eyes, hazards
16	They have a general talk on the subject in-house, induction and then on-going

It was perturbing to see a general lack of attention in general to health and safety, evidenced by both tutors and learners ie during a session in a tertiary establishment where the room was crowded with 2/3 students to a machine and the ceiling was being painted by decorators (Appendix 19).

However there was no liaison between the various sectors as to the development of resources - workbooks etc even though the same software was encountered within sections of the same sector and there seemed to be a case of reinventing the wheel (see Table 46 below).

TABLE NO 46
EXTRACTED DATA FROM INTERVIEWS WITH TUTORS (APPENDIX 18)

WHAT COURSEWARE DO YOU UTILISE FOR IT TRAINING?	
TERTIARY	
1	Workbooks
2	Assignments
3	CLAIT books/past assignments
SECONDARY	
4	workbooks
5	workbooks
6	several word processing/typing books
7	previous exercises
8	No
13	CLAIT
PRIVATE	
9	CLAIT excellent/outstanding
10	trainer has a selection of textbooks from which material is copied
14	Workbooks from Head Office. Centre prepared handouts

LEARNERS

It has been highlighted in the previous section how most learners acquired their IT skills. This section analyses the data concerned with the social implications of this IT skill acquisition.

The evidence revealed that although 53.4% of females would contact an instructor for help in a problem solving situation only 36.6% of males would do so. This is particularly evident in the tertiary sector where twice as many females in this sector would ask an instructor for help. However in both the Secondary and Private sectors more males than females would approach the instructor for help. This figure is analysed by educational sector in the Table below.

TABLE NO 47
EXTRACTED DATA FROM QUESTIONNAIRE TO LEARNER (APPENDIX 12)

ANALYSIS BY EDUCATIONAL SECTOR OF WILLINGNESS TO CONTACT AN INSTRUCTOR FOR HELP

	MALE	FEMALE
TERTIARY	22.0%	43.1%
SECONDARY	39.0%	27.5%
PRIVATE	39.0%	29.4%

The data also indicated that 59.5% of males would contact a friend for help whereas only 40.5% of females would do so. This is analysed by educational sector in the Table overleaf.

TABLE NO 48
EXTRACTED DATA FROM QUESTIONNAIRE TO LEARNER (APPENDIX 12)

ANALYSIS BY EDUCATIONAL SECTOR OF WILLINGNESS TO CONTACT A FRIEND FOR HELP

	MALE	FEMALE
TERTIARY	24.0%	58.8%
SECONDARY	44.0%	5.9%
PRIVATE	32.0%	35.3%

A very much larger proportion of females in the tertiary sector would therefore contact a friend for help compared with only 24% of males from this sector. Surprisingly in the secondary sector only 5.9% of females would ask a friend for help whereas 44% of males would do so. In the private sector the figures were fairly equal ie 32% of males and 35.3% of females would ask a friend for help.

Males generally, however, seemed to prefer to look to a manual for help eg 57.1% of males would do so, compared with 42.9% of females. Of the 57.1% of males who would look to a manual for help 75% of these were from tertiary and the other 25% were from the private sector. None were from the secondary sector. Of the females who would look to a manual for help the whole 42.9% were from the tertiary sector. However there was no data to confirm that access to manuals was the same for all 3 sectors.

The tutors unanimously felt that the acquisition of IT skills had a positive affect on the interest of the learners (see Table 49 below).

TABLE NO 49
EXTRACTED INFORMATION FROM APPENDIX 18 ANALYSED BY EDUCATIONAL SECTOR

HOW DOES THE ACQUISITION OF IT SKILLS AFFECT THE INTEREST OF THE LEARNERS?	
TERTIARY	
1	Either like it or don't. Presentation is so important to assignments that they have to use word processing. Harvard graphics will be used more in the future.
2	It can made quite a difference. As they learn it can do things they get quite a buzz out of it.
3	Most like it.
SECONDARY	
4	3 different rooms of computers. If they are on a NIMBUS they are excited. On the BBC's they get frustrated. They are quite interested in the Amstrads there is no noise in the classroom - they are quite quiet!
5	All very interested - like games
6	Improves interest - particularly lower ability. Take a greater pride in work because of "presentation".
7	very interested
8	Tremendous help - increases challenge. Pupils do not regard it as learning. They do not want to leave the computer at the end of the lesson.
13	The whole of the course is made more interesting by the use of computers. Helps with discipline.
PRIVATE	
9	Yes
10	Encourage interest - enjoy programming
14	Much more interested on the computer.
16	Lots of them want to learn from the computer. You need to adopt relevance because they switch off theoretically.
17	Two groups - follow instructions, ask intelligent questions. Varies with software. Like pictorial/graphs/visual aspects.

One of the important factors to emerge was that the level of interest of learners in IT was affected by the type of hardware they were using (Appendix 18); particularly with those learners from the secondary sector. The pupils in school generally have access to 3 types of hardware ie BBC,

Amstrad and a Nimbus network (Appendix 15). Observations, confirmed by teachers, on the 3 different machines revealed that on the BBC's - now being phased out - the pupils were less interested and more inclined to become frustrated. On the Amstrads - generally recognised as being more "business orientated - the working atmosphere was quieter and pupils were interested. However in the Nimbus networked room - where the pupils were exposed to extremely high quality coloured resolution with superb graphics packages, the pupils were highly excited and very hard to control, not wanting to leave the room at the end of the lesson. This was confirmed in the private sector also where the trainers felt that the trainees preferred the pictorial software. Some tutors thought that there was a general improvement in discipline when using Amstrads (Appendix 18).

Another aspect to the interest factor was that some tutors felt that the learners did not equate using a computer with formal lessons (Appendix 18). One tutor felt that this was because of the practical element indicating that any practically based subject was found to be more interesting than a theoretical lesson.

A further aspect revealed regarding interest of students was the beneficial effect of using computers with lower ability learners (Appendix 18). This type of learner appeared to particularly enjoy their work with computers (especially word processing where it replaced the tedium of

handwriting). Many teachers in the secondary sector expressed the view that computers were used with lower ability students to maintain their interest.

The interest factor for all types of learners was obviously enhanced by the greater span of attention which emanated from computer use (see Table 50 below).

TABLE NO 50
EXTRACTED DATA FROM INTERVIEWS WITH TUTORS (APPENDIX)18

"HOW DOES THE ACQUISITION OF IT SKILLS AFFECT THE ATTENTION OF THE LEARNERS?"

TERTIARY

1

2 Practical work hold their attention - shuts them up - while they are on the machine the time flies.

3 More attentive because of the practical element. Dependent on t he group.

SECONDARY

4 Unless they see themselves making progress they will not attend.

5 Varying the lesson - don't become bored. More attentive than a theoretical lesson.

6 Much better but sometimes disappointed initially that they cannot play games as at home.

8 Concentrate a lot more at the machine - normal attention span 10/15 minutes - on a computer 30 minutes - no behaviourial problems - not so much with the girls.

13 more effective

PRIVATE

9 yes

10 The more interested the more attentive. Surprising how many come from school without having used a computer. Because they are in small groups they are more attentive.

14 Attention very limited in the first years. blase because they think they have done it at school. They have never learned to touchtype. They have never encountered business packages. They are limited to lococscript at school.

16 Span of attention not very long from school leavers. Its not until they get on the computer that they start to learn.

17 Yes - very interesting in the computer room and they do pay attention.

It was again generally thought that attention was maintained because of the practical aspect. Tutors generally felt that if the learners did not see progress being made, or if they did not see the relevance, the attention of the learners could not be maintained (Appendix 18). During observation of IT in the practical situation it was noticed that when difficulties were encountered the "machine" was blamed and the learner mentally "switched off" and became engrossed in ordinary everyday conversation with their colleagues (Appendix 19).

As far as social interaction is concerned the data from the questionnaire to learners revealed that 86.3% of them talked socially during their IT sessions. This was categorised by gender into 41.8% male and 58.2% female. The Table below gives an indication of this data by educational sector.

TABLE NO 51
EXTRACTED DATA FROM QUESTIONNAIRE TO LEARNERS (APPENDIX 12)

SOCIAL TALK ANALYSED BY EDUCATIONAL SECTOR AND GENDER		
	MALE	FEMALE
TERTIARY	33.3%	42.1%
SECONDARY	38.7	26.4%
PRIVATE	28.0%	31.6%

The social interaction between learners was perceived by the tutors as follows:

TABLE NO 52
EXTRACTED DATA FROM INTERVIEWS WITH TUTORS (APPENDIX 18

"DOES THE ACQUISITION OF IT SKILLS HAVE ANY SOCIAL IMPLICATION?"	
TERTIARY	
1	Always work in groups. One of the benefits of not having enough computers.
2	-
3	Encourage learning from each other - not isolated when using a computer
SECONDARY	
5	None
6	If they can show a degree of confidence in the computer they could be looked up to.
7	Yes because very keen to help each other. Much more sociable.
8	The layout of the room is important - no teacher at the front.
9	Does not seem to.
13	Builds confidence.
PRIVATE	
10	Not really
14	Would not help each other as much in the normal situation but do on computers - no superiority.
16	Not really - more involved if they can do it.
17	Social implication of technology ie technology in the home - hi-fi - this helps their interest.

The tutors also had views about the effect of IT on the relationship between students (Table 53 below)

TABLE NO 53
EXTRACTED DATA FROM INTERVIEWS WITH TUTORS (APPENDIX 18)

"HOW DOES THE ACQUISITION OF IT SKILLS AFFECT THE RELATIONSHIP BETWEEN STUDENTS?"	
TERTIARY	
1	They would go first to each other and this would be encouraged.
2	Become vociferous - I'm not playing! Interact with the computer - become absorbed.

3	More movement in the IT room.
SECONDARY	
4	More one upmanship in the early stages because they relate to computer at home. After that they need to concentrate. Structured situation.
5	Wide range of ability - so they help each other and this is encouraged. Would not be encouraged in a theoretical lesson. Noisy but busy lesson.
6	More included to produce work. Try to discourage pupils helping each other - blind leading the blind. Unless they have proven ability.
7	Much more competitive - keen to be one step ahead of their peers. Not so in theoretical lessons.
8	As soon as they discover how to do something they work to show someone else. Help each other.
13	Encourage them to help each other and to learn as a team.
PRIVATE	
9	More intercourse between students when using computers.
10	Encourage helping each other
14	They are pretty good at helping each other.
16	They help each other a lot. They would rather ask each other.
17	Yes lots of interaction - trainees help each other and this is good because they are using their knowledge effectively. Get involved in the resource material.

Overall 45% of the learners indicated that they also talked socially to their tutors during their IT sessions.

There was evidence from the tutors of interaction between learners in group/team work and this was confirmed by the low).

TABLE NO 54
EXTRACTED DATA FROM QUESTIONNAIRE TO LEARNERS (APPENDIX 12)

GROUP TEAM WORK IN THE BUSINESS STUDIES CURRICULUM

	MALE	FEMALE
TERTIARY	38.1%	47.6%
SECONDARY	39.2%	31.4%
PRIVATE	22.7%	21.0%

Group/team work was therefore carried out more by females in the tertiary sector.

Motivation in learners was generally thought by the tutors to be enhanced by computer use (see Table 53 below).

TABLE NO 54
EXTRACTED DATA FROM INTERVIEWS WITH TUTORS (APPENDIX 18)

"HOW DOES THE ACQUISITION OF IT SKILLS AFFECT THE MOTIVATION OF THE LEARNERS?"	
TERTIARY	
1	Much more motivated when using graphics. More motivated with skills based course.
2	frustration factor creeps in sometimes.
3	Relevant for job prospects. Necessary to know how to operate a computer.
SECONDARY	
4	Can motive but can be a cop out
5	Like to get a print out straight away - like graphics
6	Very much but particularly lower ability. less frustrating word processing.
7	extremely motivating because of the practical element.
8	Girls still like to write - boys use the word processor
13	More motivating
PRIVATE	
9	yes - practical lesson more motivating
14	Yes because they enjoy it more
16	More highly motivated as long as it is directed. They try to use the software to apply it to them ie their own individual hobbies and they are encouraged because they are learning.
17	some say they hate computers that is boring but there is definite motivation with graphics.

It was generally agreed by tutors and learners that IT makes learning more pleasurable Again learners were more highly motivated when using graphics but several tutors suggested that "the true motivation came from its relevance for job prospects."

There was a consensus of opinion that learners were much more likely to assist each other during computer work than in a theoretical lesson hence there was more movement, noise during this type of lesson (Appendix 18). Tutors agreed that they encouraged this in such a practical lesson but might not be so tolerant in a theoretical lesson. Only 2 teachers discouraged the learners from helping each other because they had had incidents where pupils had been wrongly instructed by their peers with disastrous results. Most tutors felt that their learners would rather ask each other than them (Appendix 18) This was borne out through personal observation when most learners would ask their neighbours first and, if not successful, then ask the tutor.

There was, additionally, much more competitiveness in the IT lessons where learners were keen to be one step ahead but at the same time as soon as a certain aspect of the skills was achieved they wanted to pass this on to their peers (Appendix 18).

It would appear that the myth of isolation at a computer is not borne out in the business studies curriculum within Sunderland (Appendices 17, 18 and 19).

CHAPTER 4 — a DISCUSSION

From an initial request to 29 educational institutions in Sunderland Tyne & Wear to assist in the research for this Thesis there were 17 positive replies. The institutions who agreed to assist with the data collection included all 3 Colleges and the Polytechnic from the Tertiary sector, 7 schools from the Secondary sector and 7 institutions from the Private training agency sector (see Appendix 4). Actual participation in the research by these educational establishments involved:

The completion of questionnaires by Tutors as to:

a their own background/expertise (Appendices 7 and 13)
b hardware/software utilised (Appendices 8 and 15
c the courses offered (Appendices 9 and 16)

The completion of questionnaires by learners to ascertain their perception of IT (Appendix 12)

Tape-recorded interviews with the Tutors to build on the quantitative data (Appendices 11 and 18), and

Personal Observation of IT sessions within the establishments (Appendix 19).

The analysis of qualifications by the Tutors revealed a lack of professional qualifications in Information Technology. Only 4.2% had a teaching Diploma in Computing or Information Technology. However it was not possible to ascertain from the data whether the reason for this was that the Tutors might not perceive the acquisition of such qualifications to be important or that the Tutors might not

be encouraged to gain such qualifications, or undertake staff development in IT, by their institutions. Staff Development appeared to be usually organised on an informal ad hoc basis and there was no evidence of Tutors being asked by management for their particular IT staff development needs in order that formal programmes of training could be devised and undertaken. Appropriate staff development needs may have been identified by management if there had been an attempt to formulate an IT policy statement by Institutions but there was no evidence of this.

Additionally, Tutors seemed not to attach very much relevance to developing industrial links as far as Information Technology was concerned, generally leaving it to the learners to discover any links. A reason for this non-involvement may be explained by the fact that a third of all Tutors had had less than 1 year of industrial experience themselves and may not therefore appreciate the relevance of industrial liaison. The views of individual Tutors did not appear to be sought in the decision making process by the management of institutions as far as IT was concerned as, in the main, Tutors were disassociated from decisions as to hardware, software, courses or financing.

Overall, very few of the learners indicated that they did not like using computers. However the learners from the "Secondary" sector seemed to indicate a very positive

attitude generally to the use of computers in their Business Studies curriculum. There could be various reasons for this and the data specific to this sector is summarised below to explore this phenomenon.

- This sector had more access to computers at home.
- The hardware used in this sector may be a relevant factor. Tutors in this sector acknowledged the heightened interest of pupils having access to the extremely high quality coloured resolution of a Nimbus in a networked room.
- It was evident that this sector did not utilise Accounts software and did very little programming but had a high usage factor of Desk Top Publishing.
- There was a particularly high reliance on the tutor for assistance in this sector, evidenced by the results of the learners questionnaire (Appendix 12) and personal observation (Appendix 19). Only half of learners from this sector indicated they would ask a friend for help in a problem-solving situation compared with much higher levels in the Tertiary sector and Private sectors.
- Although reference to computer manuals for assistance was common among males in the Tertiary sector there was not one instance of a male or a female from the Secondary sector referring to a computer manual for assistance. However it was not possible to ascertain from the questionnaires or the observation period whether computer manuals were equally available in all sectors.

The suggestion is made that it may be that the learners from the Secondary sector perceive information technology as mainly a leisure pursuit. My argument for this stems from a variety of indicators detailed as follows. Learners from the Secondary sector are more likely to have access to computers at home and may use them for playing games. Also, they prefer the coloured interaction of the high

quality graphics of a Nimbus in a networked room. There were instances, during the observation of IT in practice, where learners were initially disappointed that they could not play games in the Business Studies lessons and there was evidence that some Tutors in this sector either allowed the learners to use the computer for games when the Business Studies work was completed or learners were simply allowed to play games for disciplinary purposes. For example Tutors would direct noisy, vociferous or badly behaved learners onto the computer in order to keep them occupied and enable the tutor to be more in "control" of the learning environment. It may be of interest at this point to note that the ratio of learner to tutor was highest in this sector 1:25 compared with 1:10 and 1:15 in the Private and Tertiary sectors respectively. It was also only in the Secondary sector where computer "clubs" had developed at lunchtimes or after school.

The last paragraph has highlighted the factors leading to the author's suggestion that the overall reason why learners from this sector enjoy information technology more than any other sector, stems from the fact that the learners from the Secondary sector view the computer as a source of leisure rather than as a business tool.

However, it is not possible to ascertain from the data whether Secondary institutions intended their learners to view information technology in this way in order to

increase the learners enjoyment level as the institutions had not developed IT policy statements. Additionally, during the interviews with Tutors (Appendix 18), there was no mention of Information Technology and the leisure connection in the answers to questions about "policies" or "influences to decision making". However as the learners from the Secondary sector were purported to be working towards accreditation in a GCSE in Business Studies it may be that the learners from this sector are not being made fully aware of the uses of IT for subsequent vocational skills. It was astonishing to find that only 10% of the learners from the Secondary sector indicated that they expected to gain employment when leaving school!

The vast majority of learners from the Secondary sector are therefore directed into the Tertiary or Private training agency sectors. There is evidence, however, that when the "Secondary" learners move to other educational sectors, they arrive with a confidence in IT skills which is not borne out by their practical application. Often it is the case where the pupils perceived previous IT competence is totally irrelevant because it has been based on software which is not industry-based and the pupils may feel demotivated in that they are "starting again". There were instances of "one-upmanship in the early stages of moving to another educational sector from the Secondary sector because the learners related to the computer at home to prove experience. It may be that the introduction and

adoption of Records of Achievement in Schools might play a beneficial role in alerting the Tutors in other educational sectors of the true expertise of the learners from the Secondary sector. Additionally it may be that by being aware of the learners expertise and level, other educational establishment will be able to build on the enthusiasm of those learners arriving from the Secondary sector and not negate it.

Although the role of Tutors generally appears not to have extended to being able to influence courses, it is interesting to note that it is the Private sector which was first to develop the new "competence based" approach to certification in Business Administration. Tutors from the Private sector generally take a more active part in the decision making process and this may account for this fact. Also Tutors from the Private sector have less general teaching experience than their colleagues in the other sectors. They may have more specific IT teaching experience and industrial experience and certainly devote more time on their Business Studies courses to developing IT competence in learners.

Although in education generally there appears to be a move away from didactic teacher-centred methodology to more student-centred approaches this was not reflected in the Tutors description of their designations where 76.1% gave their designations as lecturer, teacher or trainer and only

16.9% indicated their role to be that of a tutor - a term which is being increasingly used to denote a more caring, guiding and counselling role resulting in the tutor becoming a facilitator and manager of the learning situation.

Indeed the tutor's role seems to have made very little movement towards the concept of the tutor as "facilitator" and "manager" of the learning situation. The vast majority of learners acquired their IT skills directly from an instructor, although workbooks are utilised for 21.6% of learners. However of this 21.6% of learners who use a workbook, 47.1% were from the Private sector.

Provision of resources was seen to be a necessary part of the role of Tutors generally, who often complained about the amount of work involved in producing "idiots guides" on the various software applications. These booklets were often jealously guarded and were sometimes not shared with colleagues! There was however a notable exception to the role of tutor as provider of resources. This was in the Private sector where there were instances where the production of resources had been removed from the tutor's role and placed in the hands of Training Officers who produced professional packages of resources which were circulated to Centres. There was however the danger here that because the Tutors had had no input into the design or content of resources the Tutors were merely delivering the

"package" and were only one step ahead of the learners themselves. Additionally, of course, it meant that no account was taken of the pre-entry behaviour or particular needs or interests of the individual learners.

It would appear that Tutors do not perceive their role to be that of acquainting themselves with the pre-entry behaviour of learners as far as information technology skills are concerned. Many take the attitude that the incoming learners have zero knowledge and start from that point.

Tutors also generally appeared not to be threatened by the emergence of computer assisted learning in any way. Indeed the acronyms CAL and IV had to be explained to many Tutors during the interview situation.

The Tutor's role in the assessment process was mainly by the marking of assignment work and there was little attempt by Tutors to promote self-assessment in IT by the learners themselves. Tutors, in the main, indicated that course evaluation was still measured by examination results apart from the Private sector who indicated that gainful employment as a result of the course was an important aspect to course evaluation.

Generally Tutors appeared to include health and safety aspects of IT on their courses but did not appear to carry

out the theoretical knowledge imparted to learners in their own practical teaching situation although the Private sector were marginally more aware of the importance of health and safety.

As there is no cohesive IT policy statement for educational/training generally within the Sunderland area, as far as the grassroots level of Tutors are concerned, there is, therefore, a lack of organised structure to enable them to take advantage of the advancements which could be made in the area of information technology in the Business Studies curriculum. There was very little evidence of the use of quite standard applications such as integrated packages or business simulation games and most Tutors relied heavily on word processing, databases and spreadsheets. This may not be due purely to lethargy on the part of the Tutors but perhaps a lack of knowledge of futuristic trends which has not permeated through to them or perhaps by financial considerations or pure bureaucracy.

Word processing is obviously the most popularly used software application. Although both databases and spreadsheets were also well used these applications were used less so in the Secondary sector. However DTP was very popular in the Secondary schools, but not in the other 2 sectors.

Electronic communications was virtually non-existent with

the exception of an electronic mail system linking the Secondary section with Sunderland Civic Centre which was purported to be used by Tutors only.

Similarly there was little evidence of the use of computer assisted learning in any significant way.

Although most institutions indicated that Information Technology had been integrated into the curriculum of their Business Studies courses, this was not the case in practice because, in the main, the subject was timetabled separately and Tutors with relevant IT expertise were allotted to the time slot rather than the Business Studies tutor. There was evidence, overall, of IT being used as a tool in the production of assignments. In one Tertiary establishment assignments were completed on disk by learners and the disk submitted for assessment. In this instance the tutor merely assessed the assignment from viewing the softcopy on his own computer in the staffroom, with no hard copy ever being produced.

It was generally observed that there was much more movement by Tutors and learners around the room in an IT learning session than in a theoretical, academically based, lesson and the myth of learners only interacting with a machine was obliterated. For the most part Tutors encouraged learners to help each other; particularly so in the Private sector and it was only in the Secondary sector where there

were instances of this not being the case.

Learners generally seemed to want to help their peers solve their IT problems and it was recognised that this would not necessarily be the case in other lessons.

Although the vast majority (86.3%) of learners indicated in their questionnaire (Appendix 12) that they would talk socially to their peers during IT sessions, only 45% of the learners indicated they would talk socially to their tutor during IT sessions. This appeared to be confirmed during the observation of IT sessions when there was much more social communication between learners and learners rather than Tutors and learners. However, as only IT sessions were observed and not theoretical ones, it is not possible to state whether the results would have been different in a theoretical learning session.

There was also evidence of group and team work being carried out in IT sessions, perhaps slightly less so in the Private sector, and this may be related to the fact that in this sector the learners are more likely to acquire their skills individually from workbooks and it may be a relevant factor that these workbooks might be mass-produced by people other than their Tutors.

As has already been outlined in this discussion chapter, the type of hardware used may influence the motivation of

learners using IT. Although earlier this was especially referred to the Secondary sector there is also evidence from the Private and Tertiary sector, to suggest that the use of graphics packages generally has a motivating influence. It is generally recognised that a way of increasing extrinsic motivation is to encourage the use of colour, movement and pictures. Certainly the evidence from the Secondary sector, which utilises more DTP, and the effect of pictorial/graphics applications from the other 2 sectors would point to the need to capitalise on this phenomenon!

However learners are unlikely to be motivated if they are not interested and they cannot become interested if they do not pay attention, so the implications of these 2 additional factors are also important. The interest and attention may be intrinsically present in the learners because of several reasons cited by the Tutors eg because they see the relevance for work or because it is a practical skill which is generally considered to be more interesting.

Quite a high percentage of learners thought their IT skills would be helpful to them when the left their present course (78.1%) and a high percentage of this figure (72.6%) looked forward to using a computer after they finished their course indicating that only a small percentage of(5.5%) were not looking forward to using them.

It would appear that the Secondary sector has recognised the value of utilising computers with learners of lower ability, recognising the fact that it extends their span of attention and therefore interest.

Surprisingly the research revealed that females generally enjoyed using the software applications more than males with the notable exceptions of accounts software and programming which males enjoyed better than females. This may indicate a degree of stereotyping by Tutors and/or learners. It may be that females perceive themselves to be less able to handle "numbers" or that males perceive themselves to be more able to manipulate "numbers". It may be that the stereotyping perception comes from the Tutors who may encourage males to do programming and accounts software. Alternatively it may be the case that Tutors and learners equate programming and accounts software with the professions which utilise them eg Computer programmers and Accountants; professions which are generally perceived to be dominated by the male gender.

There were definite territorial implications emanating from the observation of IT in practice within institutions. Generally males and females did not sit next to each other and there were groups of males and groups of females around the rooms. Learners seemed to identify with one computer even though they were using floppy disks and it would not

have mattered which computer they used!

Generally, over half the learners acknowledged having access to a computer at home although it seemed not to matter whether this was compatible with that used on their Business Studies courses. However, of the few (17.6%) who used their computers at home for more than 5 hours a week, the vast majority were male.

As has been suggested earlier in this discussion chapter, there was very little evidence of any of the educational sectors within Sunderland attempting to form links to ensure progression of Information Technology skills in learners. Even within sectors where educational establishments were, for the most part, delivering similar courses, there had been little attempt to collaborate on the production of resources or standardise on hardware or software. However the influence of the Local Education Authority on Schools has had some impact on this in the Secondary sector where purchasing policies have influenced hardware provision.

A summary of this Discussion chapter is outlined below.

b CONCLUSIONS

Information technology is perceived by many Tutors to be a separate subject in the Business Studies curriculum.

Although progress is being made towards using IT as a tool, within the Business Studies framework, there is little evidence of true integration. Although most learners enjoy using IT, those from the Secondary sector appear to enjoy it more so and the reason for this may be that these learners regard the use of computers mainly for leisure pursuits.

The role of the tutor has not altered as a result of the impact of information technology. The tutor continues to dominate the learning situation and there has been little movement towards using any form of computer assisted learning, student-centred learning or the role of the tutor changing to that of Facilitator or Manager.

Software applications used in the Business Studies curriculum of educational establishments within Sunderland are restricted to word processing and databases. Although spreadsheets are popular they are not used very much in the Secondary sector which has the highest usage of Desk Top Publishing. There was little evidence of the use of fifth generation computing or electronic communications.

The environment within which IT learning takes place are generally noisy with lots of movement and interaction between Tutors and learners. There is usually more interaction between the learners themselves because they are much more likely to help each other in problem

solving situations. There was no evidence of learners being absorbed in interaction with computers only, indeed just the opposite.

It is unequivocal that the use of information technology in the Business Studies curriculum has a positive affect on extending the attention span of learners, increasing their interest in a lesson and heightening their motivation generally. However these factors are all the more evident when learners are using software which has colour, movement or is pictorial ie desk top publishing and graphics.

There is no evidence of any communication link between educational institutions within the same educational sector to rationalise software or collaborate on resource provision. Similarly there is no evidence of communication between the Tertiary, Secondary and Private sector to develop progression levels in information technology in the Business Studies curriculum.

This Discussion Chapter has highlighted issues for investigation and has indicated actions which might be taken to improve information technology practice in the educational sectors of Sunderland Tyne & Wear and these are documented below in Recommendations.

RECOMMENDATIONS

The following specific actions are suggestions as to ways in which the Information Technology experience of Tutors and learners, involved in Business Studies courses, could be improved.

Educational institutions should give consideration to the formulation of IT policy statements which should include an audit of their establishments in terms of current practice in order to indicate an IT action plan which would highlight appropriate staff development needs.

It may be that the educational institutions within each sector would benefit from the creation of a link to take advantage of each others experiences in order to lead to collaboration in some areas, for example resources or to achieve consensus on the level of software.

Arising from the collaborative effort of educational institutions within sectors, there should be the establishment of positive communication links between the sectors, perhaps including the primary sector, to determine a definite progression policy for Information Technology in the Business Studies curriculum.

Working Parties should be established from the links forged between the sectors leading to subgroups of Tutors being formed to look at particular areas of concern or interest.

There is no doubt that collaboration on the issue of "IT in the Business Studies curriculum" between educational/training institutions and between educational sectors would enhance the whole learning/teaching experience of all those involved.

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APPENDIX 1

THE ROLE OF AN INFORMATION TECHNOLOGY DEVELOPMENT UNIT - Extracted from FEU (1985) pp28/29

An information Technology unit in a college of further education should be the focus of a number of interrelated activities in staff development.

I The development and teaching of a core course in concepts of advanced information technology and expert systems to be offered to all students.

II The development of modules incorporating applications of advanced information technology as components of the range of college courses.

III Introducing artificial intelligence to teachers.

IV Collaborating with subject specialist teachers in the introduction of applications of advanced information technology into the teaching of their courses.

The central purpose of the unit should be technology transfer, from the few with specialist expertise to the many who can make use of it. It will require computer hardware with sufficient power to run small expert systems; the same microcomputers that are now in commercial use. The management structure and system of accountability will vary between colleges, but the Information Technology Development Unit should not be identified with mathematics, science, or even computing, but involve representatives of each college department.

A college-based unit should enjoy the support of the Further Education Unit New Technology Working Group at a national level, and should establish connections with research groups and centres in their geographical vicinity, whether based in universities, polytechnics or industry.

EXTENDING THE CORE

There is considerable potential for building on the core course for students and the introductory course for lecturers by progressively developing modules incorporating applications of advanced information technology as components of specialist courses.

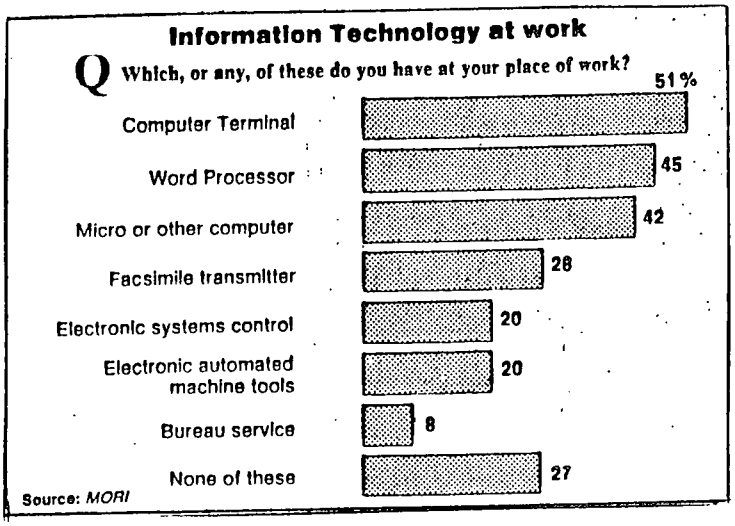
Some materials will have to be developed by the college unit with staff from the appropriate departments, some may become available from outside sources including other colleges and some may be produced by adapting existing software systems for tutorial use. For example,

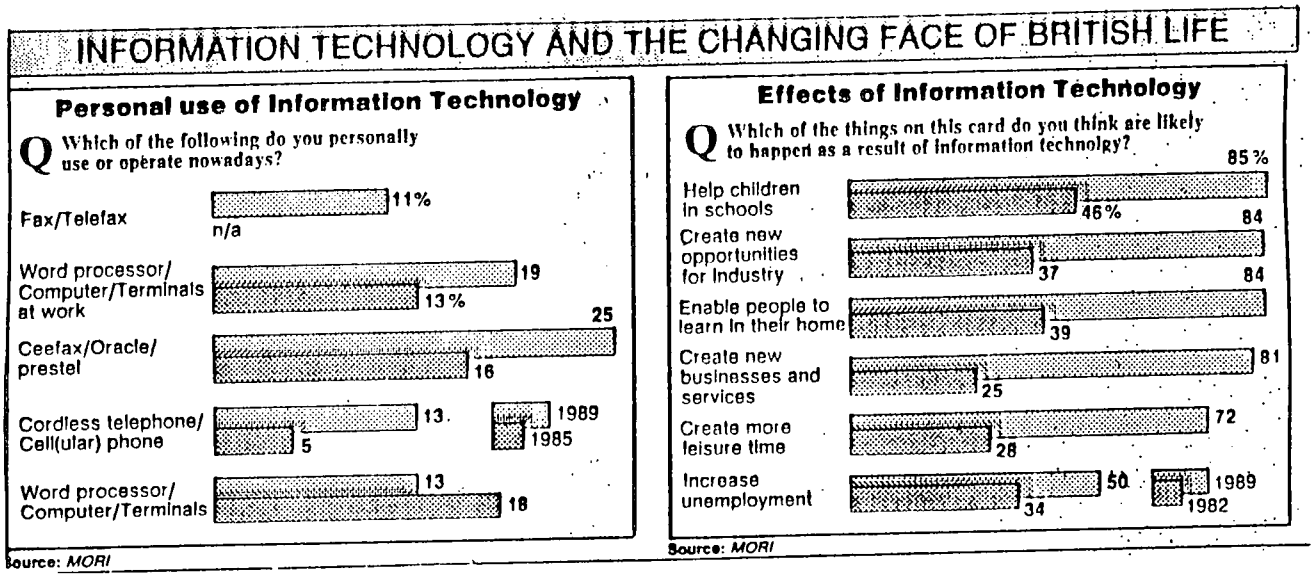
intelligent frontend programs can be developed for large software systems making them more accessible to the non-specialist user.

The expertise of the subject specialist lecturer is of central importance in the educational developments of expert systems and other forms of advanced information technology. Systems that are developed must meet the criteria of the expert, and should involve him in the development where possible. Staff of the Information technology Development Unit take on the role of "knowledge engineer", seeking to represent the knowledge of the subject area in a way that satisfies the expert and provides appropriate answers and explanations in response to questions.

The lesson from previous collaborative research projects in this field is that this is the crucial stage in "technology transfer", where the new technology is taken on by the expert teacher or lecturer without sacrificing his view of his subject. The resulting programs and educational activity will vary greatly according to the background and educational approaches of the lecturers. The same program should be capable of use in a variety of ways.

EXTRACT FROM A MORI POLL REPORTED IN THE SUNDAY TIMES - NOVEMBER 1989





Home Tel No 091 4169660
Work Tel No 091 512 0660

APPENDIX 3

c/o Monkwearmouth College

Shiney Row Centre

Success Road

Shiney Row

SUNDERLAND

20 August 1989

Dear Sir/Madam

As a lecturer in Secretarial Studies at Monkwearmouth College I am in the process of undertaking research at Durham University in the pursuance of an MA (Ed) and am writing to enlist your assistance in this matter.

The research will take the form of an investigation into the information technology aspects of the Business Studies curriculum of a number of educational/training establishments. In particular I intend looking at the following areas:

1 Types of courses offered and degree of IT input.

2 Teaching/learning methodology

3 Configurations/Software Systems/student/hardware ratio.

4 Teacher/Trainer/Lecturer expertise and qualifications.

Your assistance is respectfully requested in two areas. Firstly your willingness to complete the various questionnaires as background information and, secondly, to give permission to visit your establishment to discuss/observe the practical aspects of IT instruction.

Your co-operation would be very much appreciated and, in reciprocation, I would be delighted to furnish you with the conclusions to the final research. I would be extremely grateful if you could indicate your willingness to assist by completing and returning the attached pre-paid postcard.

Yours faithfully

P Collins (Mrs) Cert Ed B Ed (Hons)

Enc

APPENDIX 4

DRAFT LETTER TO BE PRODUCED ON COLLEGE NOTEPAPER AND SENT TO:

Head of Faculty of Education - Sunderland Polytechnic

Heads of Business Studies Monkwearmouth and Wearside Colleges

Heads of Business Studies/Information Technology Departments in the following schools:

Biddick School Biddick Lane Washington
Broadway School Springwell Road Sunderland
Castleview Secondary School Cartwright Road Hylton
Farringdon School Allendale Road Sunderland
Houghton School Hetton Road Houghton le Spring
Monkwearmouth School Torver Crescent Sunderland
Oxclose School Dilston Close Oxclose Village Washington
Pennywell School Portsmouth Road Hylton
Southmoor Secondary School Ryhope Road Sunderland
St Aidan's RC Comprehensive School Willow Bank Road Sunderland
St Anthony's RC School Thornhill Road Sunderland
St Robert of Newminster RC School Biddick Lane Washington
Thorney Close Secondary School Telford Road Sunderland
Thornhill School Thornholme Road Sunderland
Usworth School Heworth Road Washington
Washington School Spout Lane Sunderland

Milltech Training Services Unit 25/4 Southwick Industrial Estate Sunderland
Sunderland Training and Trade Co Ltd Unit 25/4 Southwick Industrial Estate North Hylton Road Sunderland
Training Services (northern) Ltd 30 Bridge Street Sunderland
Tyne & Wear Chamber of Commerce and Industry 59a Fawcett Street Sunderland
Write and Learn NE Ltd 45 Hutton Close Crowther Industrial Estate Washington
Business Training Centre 19 Villiers Street Sunderland
Control Data Institute Unit 19 Bridge House Bridge Street Sunderland
Ford and Pennywell Community programme 478 Hylton Road Sunderland
ITEC Information Technology Centre Unit BT 25/26a Southwick Ind Est North Hylton Road Sunderland
Keyboard Training Ltd 2nd Floor Lynas House Frederick Street Sunderland
Metcon Training Town Centre House Crowtree Road Sunderland

APPENDIX 5

Home Tel No 091 4169660
Work Tel No 512 0660

c/o Monkwearmouth College
Shiney Row Centre
Success Road
Philadelphia
Houghton-le-Spring
Tyne & Wear
DH4 4TL

16 October 1989

Dear Sir/Madam

I wrote to you on 20 August 1989 requesting your assistance in my research at Durham University into Information Technology in the Business Studies curriculum. As I have not received a reply from you it may have been that the original letter and reply-paid postcard have been misplaced - particularly as it would have been received at a very busy time for your establishment.

I am therefore enclosing a further copy of my letter together with a replacement reply-paid postcard and would be extremely grateful if you would agree to giving me your assistance in this matter.

Yours faithfully

P Collins (Mrs) B Ed (Hons) Cert Ed (FE) RSA Dip

Enc

APPENDIX 6

INITIAL REPLIES RECEIVED FROM EDUCTION ESTABLISHMENTS WITHIN SUNDERLAND OFFERING TO TAKE PART IN THE RESEARCH

NAME/ADDRESS/TELEPHONE NUMBER OF ESTABLISHMENT	CONTACT
Higher Education Establishments	
1 Sunderland Business School 1 - 4 Thornhill Park Sunderland 515 2331	Jim Rowe
Tertiary Establishments	
2 Monkwearmouth College Swan Street Sunderland 5487119	Fred Jacobson
3 Wearside College Bede Centre Durham Road Sunderland 5110515	Barbara Lamb
Secondary Schools	
4 Biddick School Biddick Lane Washington 4172013 Ext 137	Margaret Hedley
5 Houghton Kepier School (Site 2) Hetton Road Houghton-le-Spring 584 3122	Mrs J Lewins
6 St Aiden's RC Comprehensive School Willow Bank Road Ashbrooke Sunderland 5282613	Joe Patterson
7 Southmoor School Ryhope Road Sunderland 5676822	Mrs Nelthorpe
8 Usworth School Heworth Road Concord Washington 4167500	Brian Young
Private Training Establishments	
9 Business Training Centre 19 Villiers Street Sunderland 091 5674400	Mrs H Guthrie

10 Sunderland Training Centre 2nd Floor Burdon House Burdon Road Sunderland 567 9185 — Mike Sanderson

11 The Sunderland Training and Training Company Ltd Unit 25/4 Southwick Industrial Estate North Hylton Road Sunderland SR5 3TX 549 2534 — C E Castle

FURTHER REPLIES RECEIVED FROM EDUCATION ESTABLISHMENTS WITHIN SUNDERLAND OFFERING TO TAKE PART IN THE RESEARCH FOLLOWING SECOND LETTER

Secondary Schools

12 Sandhill View School
Telford Road
Sunderland
5282322 — Mr I Holmes

13 Farringdon School
Allendale Road
Sunderland
5280627 — Pam Egdell

Private Training Establishments

14 Key Training Ltd
Lynas House
Frederick Street
Sunderland
5650448 — Mrs M Brown

15 Training Services (Northern) Ltd
36 Bridge Street
Sunderland
5679306 — Miss C S Robson

16 Sunderland ITEC
Southwick Ind Est
North Hylton Road
Sunderland
5492842 — Brian Grey

17 Tyne & Wear Chamber of Commerce
59a Fawcett Street
Sunderland
510 9090 — Ann Bowman

IN THE BUSINESS STUDIES CURRICULUM - TEACHER/LECTURER/TRAINER
KGROUND INFORMATION

ould be grateful if the following information could be completed
each member of staff involved in teaching IT in the business
dies curriculum, "ticking" where appropriate. Pauline Collins.

FOR COMPUTER USE

E ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐ 1-30

CATIONAL ESTABLISHMENT

HIGHER	☐	1
TERTIARY	☐	2
SECONDARY	☐	3
PRIVATE	☐	4

31

IGNATION

LECTURER	☐	1
TEACHER	☐	2
TRAINER	☐	3
TUTOR	☐	4

32

LIFICATIONS

DEGREE	☐	33
CERTIFICATE IN EDUCATION	☐	34
TEACHERS' CERT IN OFFICE STUDIES	☐	35
TEACHING DIPLOMA IN COMPUTING/IT	☐	36

ERAL "TEACHING" EXPERIENCE

20 YEARS OR OVER	☐	1
15-19 YEARS	☐	2
10-14 YEARS	☐	3
5-9 YEARS	☐	4
4 YEARS OR LESS	☐	5

37

CIFIC "IT" TEACHING EXPERIENCE

20 YEARS OR OVER	☐	1
15-19 YEARS	☐	2
10-14 YEARS	☐	3
5-9 YEARS	☐	4
1-4 YEARS	☐	5
LESS THAN 1 YEAR	☐	6

38

MERCIAL/INDUSTRIAL EXPERIENCE

10 YEARS OR OVER	☐	1
5 YEARS OR OVER	☐	2
1 YEAR OR OVER	☐	3
6 MONTHS - 1 YEAR	☐	4
3 MONTHS - 6 MONTHS	☐	5
NONE AT ALL.	☐	6

39

AFF DEVELOPMENT UNDERTAKEN IN IT

UNIVERSITY/POLYTECHNIC	☐	40
COLLEGE	☐	41
SCHOOL	☐	42
MANUFACTURER	☐	43
IN-HOUSE	☐	44
INDUSTRY	☐	45

ANK YOU FOR COMPLETING THIS QUESTIONNAIRE. PAULINE COLLINS
/Q1/90

IT IN THE BUSINESS STUDIES CURRICULUM - EQUIPMENT DETAILS

NAME OF EDUCATION ESTABLISHMENT .....

EDUCATIONAL CATEGORY PRIMARY/SECONDARY/TERTIARY/HIGHER/PRIVATE
(Please delete as applicable)

PLEASE COMPLETE THE TABLE BELOW WITH DETAILS OF EQUIPMENT PRESENT IN YOUR ESTABLISHMENT FOLLOWING THE EXAMPLE GIVEN.
THANK YOU.

HARDWARE	SOFTWARE	COURSEWARE
12 IBM PS2 Computers each with hard disk using 3½" compact data disk	Multimate Ability Plus Lotus Dbase III Pegasus Accounting PF Desk Top Publishing	Textbooks - Word Processing Assignments - G G Skinner Centred prepared handouts/Assignments RSA/BTEC Assignments Assignment material from Business Education Today

IT IN THE BUSINESS STUDIES CURRICULUM - COURSE DETAILS

NAME OF EDUCATION ESTABLISHMENT .....

EDUCATIONAL CATEGORY PRIMARY/SECONDARY/TERTIARY/HIGHER/PRIVATE
(Please delete as applicable)

PLEASE COMPLETE THE TABLE BELOW FOR EACH TYPE OF COURSE OFFERED FOLLOWING THE EXAMPLE GIVEN. THANK YOU.

COURSE OFFERED	QUALIFICATIONS ARISING	AGE RANGE	NO OF STUDENTS	MALE	FEMALE	LINKS WITH INDUSTRY
Computer Literacy and Information Technology	RSA CLAIT Certificate	16/17	20	15	5	Occasional field visit

APPENDIX 10

D I A R Y O F V I S I T S
TO EDUCATION ESTABLISHMENTS DURING RESEARCH PERIOD

NAME	FIRST VISIT	SECOND VISIT	THIRD VISI
SUNDERLAND POLYTECHNIC	26/01/90	23/03/90	03/04/90
MONKWEARMOUTH COLLEGE	02/05/90	13/6/90	10/10/90
WEARSIDE COLLEGE	19/01/90	02/04/90	18/05/90
BIDDICK SCHOOL	11/01/90	15/02/90	05/04/90
HOUGHTON KEPIER	23/01/90	27/03/90	01/05/90
ST AIDENS	02/02/90	04/05/90	21/06/90
SOUTHMOOR	06/02/90	13/03/90	11/05/90
USWORTH SCHOOL	18/01/90	15/03/90	06/04/90
BUSINESS TRAINING	01/03/90	03/05/90	17/05/90
SUNDERLAND TRAINING	26/02/90	14/05/90	18/06/90
SUNDERLAND TRAINING & TRADING CO	20/02/90		
SANDHILL VIEW	12/02/90	24/05/90	12/07/90
FARRINGDON	20/03/90	03/04/90	18/05/90
KEY TRAINING	08/02/90	10/05/90	25/06/90
TRAINING SERVICES	08/03/90		
SUNDERLAND ITEC	16/02/90	27/04/90	25/05/90
TYNE & WEAR CHAMBER OF COMMERCE	03/01/90	22/03/90	10/05/90

APPENDIX 11

SEMI-STRUCTURED INTERVIEW QUESTIONS - IT STAFF

Respondents were asked a number of semi-structured questions divided into 5 areas as follows:

1 Communication
2 Management
3 Methodology
4 Learners
5 Assessment/Evaluation

1 COMMUNICATIONS

1.1 IS THERE ANY COMMUNICATION BETWEEN YOUR ESTABLISHMENT AND THE LEARNERS' PREVIOUS EDUCATIONAL ESTABLISHMENT TO ASCERTAIN PRE-ENTRY BEHAVIOUR IN IT?

1.2 IS THERE ANY COMMUNICATION BETWEEN YOUR EDUCATIONAL ESTABLISHMENT AND THE LEARNERS' DESTINATION TO ACQUAINT THEM WITH THEIR IT EXPERTISE?

1.3 WHAT ELECTRONIC COMMUNICATION FACILITIES ARE THERE WITHIN/WITHOUT YOUR EDUCATIONAL ESTABLISHMENT?

2 MANAGEMENT

2.1 WHO IS RESPONSIBLE FOR DECIDING WHAT COURSES TO OFFER?

2.2 WHAT ARE THE DETERMINING FACTORS BEHIND THESE DECISIONS?

2.3 WHAT GUIDELINES/POLICIES ARE ADHERED TO IN IT DECISION-MAKING?

2.4 ARE THERE ANY "OUTSIDE" INFLUENCES TO THIS DECISION-MAKING?

2.5 WHO DECIDES ON THE PURCHASES OF HARDWARE/SOFTWARE?

2.6 ON WHAT BASIS ARE THESE DECISIONS MADE?

2.7 IS THERE ANY SPECIFIC BUDGETARY CONTROL FOR IT PROVISION?

2.8 WHAT IS THE AVERAGE RATIO OF HARDWARE/STUDENT?

2.9 WHAT IS THE AVERAGE RATIO OF TEACHER/LEARNER?

2.10 WHO IS RESPONSIBLE FOR STAFF DEVELOPMENT IN IT WITHIN YOUR ESTABLISHMENT?

2.11 HOW IS STAFF DEVELOPMENT ORGANISED?

2.12 WHAT LINKS ARE THERE WITH INDUSTRY AS FAR AS IT IS CONCERNED?

3 METHODOLOGY

3.1 WHAT IS THE AVERAGE NUMBER OF HOURS SPENT ON IT ON EACH COURSE?

3.2 IS A COMPUTER AVAILABLE AS A RESOURCE TO THE LEARNERS?

3.3 DOES AN IT SPECIALIST TEACH THESE ASPECTS OF YOUR COURSES?

3.4 WHAT IS YOUR MAIN TEACHING METHODOLOGY FOR IT?

3.5 DO YOU USE ANY FORM OF CAL/IV?

3.6 IS IT TIMETABLED SEPARATELY OR IS IT INTEGRATED INTO THE BUSINESS STUDIES CURRICULUM?

3.7 WHAT PERCENTAGE OF THE IT INPUT ON THE COURSE IS "HANDS ON"?

3.8 IS THERE ANY SPECIFIC KEYBOARD TRAINING GIVEN TO MAXIMISE INPUTTING SPEED?

3.9 WHAT COURSEWARE DO YOU UTILISE FOR IT TRAINING?

3.10 IS THE COURSEWARE COMMERCIALLY PURCHASED OR PRODUCED INTERNALLY.

3.11 WHAT TEXTBOOKS DO YOU UTILISE FOR IT TRAINING?

3.12 HOW MANY HOURS PER DAY DOES A STUDENT SPEND AT A COMPUTER?

3.12 WHAT HEALTH AND SAFETY ASPECTS OF IT ARE INCLUDED ON THE COURSE?

4 LEARNERS

4.1 HOW DOES THE ACQUISITION OF IT SKILLS AFFECT THE INTEREST OF THE LEARNERS?

4.2 HOW DOES THE ACQUISITION OF IT SKILLS AFFECT THE ATTENTION OF THE LEARNERS?

4.3 HOW DOES THE ACQUISITION OF IT SKILLS AFFECT THE MOTIVATION OF THE LEARNERS?

4.4 HOW DOES THE ACQUISITION OF IT SKILLS AFFECT THE RELATIONSHIP BETWEEN STUDENTS?

4.5 DOES THE ACQUISITION OF IT SKILLS HAVE ANY SOCIAL IMPLICATIONS?

4.6 HAVE YOU EXPERIENCED ANY PROBLEMS WITH IMPLEMENTING IT IN THE CURRICULUM AS A RESULT OF RELIGIOUS/ETHICAL REASONS?

5 ASSESSMENT/EVALUATION

5.1 WHAT FORM OF ASSESSMENT DO YOU USE FOR THE ACQUISITION OF IT SKILLS?

5.2 WHAT FORMS OF SELF-ASSESSMENT FROM THE LEARNERS VIEWPOINT DO YOU INCLUDE ON THE COURSE?

5.3 HOW DO YOU RECORD THE LEARNERS' ACQUISITION OF IT SKILLS.

5.4 HOW IS YOUR COURSE EVALUATED?

Q U E S T I O N N A I R E

FOR COMPUTER USE

Please tick the most appropriate answer:

1 Which describes you best?

STUDENT	☐	1
PUPIL	☐	2
TRAINEE	☐	3
OTHER	☐	4

1

IF "OTHER" PLEASE SPECIFY

.....

2 How old are you?

14	☐	1
15	☐	2
16	☐	3
17	☐	4
18	☐	5
over 18	☐	6

2

3 What sex are you?

Male	☐	1
Female	☐	2

3

4 How many hours a week do you use a computer in your Business Studies course?

less than 1	☐	1
1 - 2	☐	2
3 - 4	☐	3
5 - 6	☐	4
7 - 8	☐	5
more	☐	6

4

5 Is a computer available for you to use here in your free time?

Yes	☐	1
No	☐	2

5

6 Do you ever have to share a computer here?

Yes	☐	1
No	☐	2

6

7 Is your printer shared?

Yes	☐	1
No	☐	2

7

8 How much do you enjoy using a computer?

Its great	☐	1
Its OK	☐	2
Not at all	☐	3

8

9 Do you have access to a computer at home?

Yes 1
No 2

9

10 How many hours a week do you spend on the computer at home?

Less than 1 1
1 - 2 2
3 - 4 3
5 - 6 4
7 - 8 5
more than8 6

10

11 Is it 'compatible' with the one here?

Yes 1
No 2

11

12 Do you use a computer for any of the following here?

Word Processing

Yes 1
No 2

12

Spreadsheets

yes 1
No 2

13

Databases

Yes 1
No 2

14

Integrated Packages

Yes 1
No 2

15

Desk top publishing

Yes 1
No 2

16

Business games

Yes 1
No 2

17

Accounts

Yes 1
No 2

18

Programming

Yes 1
No 2

19

Electronic mail/communications

Yes 1
No 2

20

13 Do you enjoy using the following software?

Word Processing	Yes No	☐ 1 ☐ 2	21
Spreadsheets	yes No	☐ 1 ☐ 2	22
Databases	Yes No	☐ 1 ☐ 2	23
Integrated Packages	Yes No	☐ 1 ☐ 2	24
Desk top publishing	Yes No	☐ 1 ☐ 2	25
Business games	Yes No	☐ 1 ☐ 2	26
Accounts	Yes No	☐ 1 ☐ 2	27
Programming	Yes No	☐ 1 ☐ 2	28
Electronic mail/communications	Yes No	☐ 1 ☐ 2	29

14 How do you learn computer applications?

From a workbook?	☐ 1	30
Directly from an Instructor?	☐ 2	
Other?	☐ 3	

IF "OTHER" PLEASE SPECIFY

.....

15 When you need help on the computer who/what would you consult?

Instructor	☐ 1	31
Friend	☐ 2	
Manual	☐ 3	
Workbook	☐ 4	
Other	☐ 5	

IF "OTHER" PLEASE SPECIFY

.....

16 When using the computers do you talk to others in the class about ordinary everyday issues?

Yes [ ] 1
No [ ] 2 32

17 When using the computers do you talk to the instructor about ordinary everyday issues?

Yes [ ] 1
No [ ] 2 33

18 Do you ever carry out any group or team projects using? the computers?

Yes [ ] 1
No [ ] 2 34

19 Do you look forward to using a computer when you leave here?

Yes [ ] 1
No [ ] 2 35

20 Do you think this information technology experience will be helpful to you when you leave?

Yes [ ] 1
No [ ] 2
Don't know [ ] 3 36

21 When you leave here where do you think you will go?

College [ ] 1
Poly [ ] 2
University [ ] 3
YTS Course [ ] 4
Work [ ] 5
Other [ ] 6 37

IF "OTHER" PLEASE SPECIFY

.....

THANK YOU FOR COMPLETING THIS QUESTIONNAIRE.

PAULINE COLLINS
SCHOOL OF EDUCATION
DURHAM UNIVERSITY

APPENDIX 13

RESULTS OF QUESTIONNAIRE - IT IN THE BUSINESS STUDIES CURRICULUM - TEACHER/LECTURER/TRAINER BACKGROUND INFORMATION

		%
EDUCATIONAL ESTABLISHMENT	HIGHER	18.3
	TERTIARY	25.4
	SECONDARY	38.0
	PRIVATE	16.9
DESIGNATION	LECTURER	38.0
	TEACHER	25.4
	TRAINER	12.7
	TUTOR	16.9
QUALIFICATIONS	DEGREE	64.8
	CERTIFICATE IN EDUCATION	42.3
	TEACHERS' CERT IN OFFICE STUDIES	11.3
	TEACHING DIPLOMA IN COMPUTING/IT	4.2
GENERAL "TEACHING" EXPERIENCE	20 YEARS OR OVER	9.9
	15-19 YEARS	9.9
	10-14 YEARS	19.7
	5-9 YEARS	28.2
	4 YEARS OR LESS	31.0
SPECIFIC "IT" TEACHING EXPERIENCE	20 YEARS OR OVER	2.8
	15-19 YEARS	2.8
	10-14 YEARS	2.8
	5-9 YEARS	26.8
	1-4 YEARS	52.1
	LESS THAN 1 YEAR	9.9
COMMERCIAL/INDUSTRIAL EXPERIENCE	10 YEARS OR OVER	46.5
	5 YEARS OR OVER	18.3
	1 YEAR OR OVER	11.3
	6 MONTHS - 1 YEAR	2.8
	3 MONTHS - 6 MONTHS	5.6
	NONE AT ALL	14.1

168

STAFF DEVELOPMENT UNDERTAKEN IN IT	UNIVERSITY/POLYTECHNIC	49.3
	COLLEGE	31
	SCHOOL	18.3
	MANUFACTURER	1.4
	IN-HOUSE	39.4
	INDUSTRY	18.3

APPENDIX 14

RESULTS OF QUESTIONNAIRE - IT IN THE BUSINESS STUDIES CURRICULUM - TEACHER/LECTURER/TRAINER BACKGROUND INFORMATION ANALYSED BY EDUCATIONAL SECTOR IE TERTIARY, SECONDARY AND PRIVATE

QUALIFICATIONS (IN PERCENTAGE TERMS)

	DEGREE	CERT ED	OFF STUDIES	DIP COM
TERTIARY	52.2	46.7	50.0	33.3
SECONDARY	32.6	40.0	37.5	33.3
PRIVATE	10.9	10.0	12.5	33.3

TEACHING EXPERIENCE (ACTUAL NUMBERS AND YEARS)

	OVER 20	15-19	10-14	5-9	4 YRS OR LESS
TERTIARY	4	4	8	10	5
SECONDARY	3	3	5	6	4
PRIVATE	-	-	1	4	7

SPECIFIC IT TEACHING EXPERIENCE (ACTUAL NUMBERS AND YEARS)

	OVER 20	15-19	10-14	5-9	1-4	LESS THAN 1 YEAR
TERTIARY	2	2	1	10	13	1
SECONDARY	-	-	1	6	12	2
PRIVATE	-	-	-	3	7	2

AMOUNT OF INDUSTRIAL EXPERIENCE

	> 10 YRS	> 5 YRS	. 1 YR	6M-1 YR	3-6 MTHS	NONE
TERTIARY	16	9	3	1	-	2
SECONDARY	7	2	4	1	2	5
PRIVATE	6	1	-	-	2	3

STAFF DEVELOPMENT UNDERTAKEN IN IT (ACTUAL NUMBERS)

	POLY	COLL	SCH	MAN	IN HOUSE	INDUSTRY
TERTIARY	19	14	1	1	8	8
SECONDARY	10	4	12	0	9	3
PRIVATE	6	2	0	0	7	0

RESULTS OF QUESTIONNAIRE - IT IN THE BUSINESS STUDIES CURRICULUM - EQUIPMENT DETAILS

TYPE OF INST	NAME	HARDWARE	SOFTWARE	COURSEWARE
1 H	Sunderland Poly	Room 20 Tapestry network Compact File server 286 machine 8 Amstrad 1512 2 Dot Matrix printers 132 col 1 laser printer	Wordstar vp planner (123 clone) Dbase IV Project Planning - "Project" Harvard graphics Ventura	Centre prepared manuals which are sold to students for about £2.00 each.
		Room 34 15 Opus machines Double Disk Drive 4 Dot matrix printers 80 col wide	QM - Quick Quant Decision Support Tool A/cs - Olive	Centre prepared assessment material (Trying to establish info centre)
		Room 25 16 Amstrad 1512 double Disk drives with hard cards 6 Dot matrix printers 80 col wide		
		Room 20 Samsung PCXT with 20 mg hard disk Mono		

		monitors single disk drive 5 printers They have standardised on 5 1/2" disks because they are cheaper for students to buy - about 20p each.		
2 T	Wearside College	45 IBM PS2 hard disk 3 1/4" drives 11 dot matrix printers	Wordperfect Lotus 123 Dbase IV First Choice	RSA Clait Book Centre prepared handouts/ assignments
3 T	Monkwearmouth College	<u>Room 108 SR</u> 16 PS2's with 20mg hard disk 3 1/4" drives 4 Dot Matrix Printers <u>Room 105 SR</u> 1 IBM PS2 with 20mg hard disk 3 1/4" drives Laser Printer <u>Room 106 SS</u> 16 IBM Double Disk Drives 5 1/2" each with Dot Matrix Printer	Multimate Lotus Dbase III+ Ability Pegasus Easywriter View Viewsheet Quest Commutel First Publisher Word perfect	Word Processing Textbooks RSA CLAIT Books Centre-prepared worksheets

		Room 107/108 SS 1 IBM Hard Disk with Double Drive 5 1/2" with Daisy Wheel Printer 2 IBM Double Disk Drives 5 1/2" with 2 Dot Matrix Printers Room 109 SS 8 IBM Double Disk Drives 5 1/2" each with dot matrix printer Room 105 SS 16 IBM PS2's 3 1/4" with 4 Dot matrix printers Room 111 SS 10 IBM portable 7 Epsom printers Room 103 SS 9 IBM PC 256's 9 dot matrix printers Room 100 SS 16 BBC's		
4 S	Biddick School	19 8256 Amstrads Single disk 3 1/4" each with a printer	Locoscript Amx Desk Top Publishing	RSA Clait Book Past Clait Assignments

			Touch and Go Mini Office Professional Games Pcw challenge	Centre prepared booklets idiots guides
5 S	Houghton Kepier	43 Amstrad 8256 each with printer 5 Amstrad 1512 each with printer 1 Amstrad 1640 with hard disk 1 Amstrad 9512	Locoscript Multiplan Mini Office Supercalc II/III DTP Wordstar A/Ability Plus Dbase II Newsmaster Printmaster	Worksheets GCSE Textbooks eg Comprehensive Business Studies Alan Whitcomb
6 S	St Aidens	20 Amstrad 8256 40 Nimbus network	Locoscript	Centre- prepared material
7 S	Southmoor	26 Amstrad 8256 40 Nimbus network	Locoscript Dbase Microdesign Cracker	Easy Access to Locoscript Locoscript Clark & Butler
8 S	Usworth School	28 Amstrad PCW 8256 Single drives 3 1/4" each with its own printer	Locscript 1 Dbase II Multiplan DTP Stop Press	Centre-set assignments Textbooks for homework/backup
9 P	Business Training Centre	28 Amstrad 1512'2 each with its own dot matrix printer	Wordstar IV Supercalc III Dbase III	Centre- Workbooks RSA Clait

				book
		6 Apple 2 E's 6 Amstrad PCW's	Appleworks Locoscript Cardbox	
10P	Sunderland Training Centre	8 Amstrad 1640's with double floppy 5 1/2" drives 4 Amstrad 2 Epsom printers 1 Juki	Quill Wordperfect Multimate Dbase IV Quest As Easy As VP Planner Timeworks Newsmaster	Centre-prepared material
12S	Sandhill View	15 Amstrad PCW's each with own printer Nimbus network	Locoscript Mini office Supercalc II Newsdesk International Multiplan	School prepared
13S	Farringdon	28 Amstrad PCW's each with own printer	Locoscript Mini Office Stop Press	"
14P	Key Training	15 Amstrad 8256's each with own printer	Wordstar Locoscript Supercalc Dbase II	Company written
16P	Sunderland ITEC	20 Olivetti PC's (10 with hard disk 3 MacIntosh II's	Wordstar Wordperfect Macwrite Multimate	Centre prepared Manuals

		networked with laser printer and scanner 1 IBM PS2 for CAD applications	Dbase II/III Supercalc III Lotus 123 Excel Fleet St Editor Pagemaker Ventura Sage Accounts Pegasus Snip Smart Auto-Cad	
17	P	Tyne & Wear Chamber of Commerce	16 IBM Compatibles MSDOS 20 mg hard disk 5 1/2" disk Image Scanner (OCR) Modem 3 Panasonic DM printers 1 laser printer	Word Perfect V Smart Sage Payroll Sage Accounts Accutype Supercalc II Dbase II Wordstar	Centre prepared workbooks

RESULTS OF QUESTIONNAIRE - IT IN THE BUSINESS STUDIES CURRICULUM - COURSE DETAILS

TYPE	COURSE	AGE	NO	SEX M	SEX F	LINKS WITH INDUSTRY
1 H	SUNDERLAND POLYTECHNIC					
	BTEC HNC Bus and Finance	18-22	50	30	20	They are on day release from industry
	BTEC HND Bus and Finance	18-22	200	100	100	2-year full time course one day a week work experience
	BA Hons Business Studies	18-30	140	70	70	Of a 3-year course 1 year is spent on industrial placement
	BA Hons Economics	18-30	50	40	10	
	Post Graduate Diploma in International Marketing	22-35	22	10	12	4 week placement
	BSc Management Studies	18-50	28	22	6	Day release from industry
	BA in IT	22-50	40	30	10	"
	HND Computing	19-50	80	45	35	Industrial placement one year

	BA in Business Computing	18-35	64	42	22	"
2 T	WEARSIDE COLLEGE					
	First Secretarial	16-18	10		10	3 week work placement
	Intermediate Secretarial	16-42	10		10	"
	B/TEC First Diploma in Bus & Finance	16-18	12	6	6	3 weeks work placement Visiting speakers. Occasional visits
	B/TEC National Diploma in Bus & Finance	16-36	22	9	13	"
	B/TEC National Certificate in Bus & Finance	18-39	13	5	8	On day release from work
3 T	MONKWEARMOUTH COLLEGE					
	First Secretarial	16-18	20	-	20	-
	Intermediate Secretarial	16-35	36	-	36	-
	Private Secretary's	17-40	12	-	12	-

	B/TEC First Diploma in Bus & Finance	16-18	10	9	1	1 day a week Work placement
	B/TEC National Diploma in Bus & Finance	17-35	130	65	65	3 weeks work placement
	B/TEC National Certificate in Bus & Finance	17-35	140	78	62	On day release from work
4 S	BIDDICK SCHOOL					
	SEG GCSE Business Studies	14-16	90	80	10	2 hrs 6 times a year in Nissan's flexible learning centre
	CLAIT	14-16	200	80	120	-
5 S	HOUGHTON KEPIER					
	GCSE Business Studies	14-16	60	15	45	Work placement
	GCSE Information Technology (includes CLAIT)	14-16	70	20	50	"
	RSA Core Text Processing	16	32	-	32	
6 S	ST AIDENS					

	GCSE Business studies Syllabus A	17-18	24	All boys	1 week work school	placement project work
	RSA Clerical Pre-vocational	16	15	"		
	CPVE	17-18	10			
7 S	SOUTHMOOR					
	CLAIT	15-16	16	6	10	
8 S	USWORTH SCHOOL					
	GCSE Business Studies Syllabus B	14-16	100	60	40	Case study in industry
9 P	BUSINESS TRAINING CENTRE					
	Pitman Business Administration Levels I and II	16-18	150	30	120	
10 P	SUNDERLAND TRAINING CENTRE					
	City & Guilds 440 Business Admin Levels I and II	16-18	10	-	10	4 days a week
12 S	SANDHILL VIEW					
	GCSE Business Studies	14-16	30	10	20	Sponsored by North England BS

	SEG GCSE IT	14-16	10	10	-	
13 S	FARRINGDON SCHOOL					
	GCSE Business Studies Syllabus B	15-16	60	24	36	Savacentre Enterprise Centre 1 week work placement
	RSA Core Text Processing	15-16	36	4	32	Visits to Business Training Centre/Key Training
14 P	KEY TRAINING					
	RSA Diploma in Office Procedures	16-18	54	7	47	4 days a week in work placement
	Associated Accountancy Technician		10	8	2	
15 P	ITEC					
	B/TEC First Information Technology	16-18	45	30	15	After 4 months students spend 1 day a week in work placement
17 P	TYNE & WEAR CHAMBER OF COMMERCE					
	LCC in Business Administration	16-17	70	3	67	Work placement 4 days a week

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RSA Diploma in Office Procedures	varied	20	20	"

SUMMARY OF BUSINESS STUDIES COURSES OFFERED IN SUNDERLAND TYNE & WEAR

TERTIARY	SECONDARY	PRIVATE
B/TEC HNC BUSINESS AND FINANCE	GCSE BUSINESS STUDIES	PITMAN BUSINESS ADMINISTRATION
B/TEC HND BUSINESS AND FINANCE	RSA CLAIT	CITY AND GUILDS BUSINESS ADMINISTRATION
BA HONS BUSINESS STUDIES	RSA CORE TEXT PROCESSING	ASSOCIATION ACCOUNTANCY TECHNICIANS
BA HONS ECONOMICS	RSA CLERICAL PRE-VOCATIONAL	B/TEC FIRST IN INFORMATION TECHNOLOGY
POST GRADUATE DIPLOMA INTERNATIONAL MARKETING	CPVE	
BSC MANAGEMENT STUDIES		
BA IN IT		
BA IN BUSINESS COMPUTING		
B/TEC FIRST DIPLOMA IN BUSINESS AND FINANCE		
B/TEC NATIONAL DIPLOMA IN BUSINESS AND FINANCE		
B/TEC CERTIFICATE IN BUSINESS AND FINANCE		
FIRST SECRETARIAL		
INTERMEDIATE SECRETARIAL		
LCC PRIVATE SECRETARY'S CERTIFICATE		

APPENDIX 18

DATA COLLECTED FROM INTERVIEWS WITH TUTORS CONDUCTED IN EDUCATIONAL ESTABLISHMENTS

This Appendix contains the results of the semi-structured questions asked during the Interview situation with Information Technology Tutors (see appendix 11). The questions divided generally into 5 areas concerned with information technology in the business studies curriculum:

1 Communication
2 Management
3 Methodology
4 Learners
5 Assessment/Evaluation

The identification numbers in this Appendix refer to those allocated to the educational establishments when their reply to indicate their willingness to help in the research was received (see Appendix 6). For ease of reference they are reproduced below.

TERTIARY

1 Sunderland Polytechnic
2 Monkwearmouth College
3 Wearside College

SECONDARY

4 Biddick School
5 Houghton Kepier School
6 St Aidens School
7 Southmoor School
8 Usworth School
12 Sandhill View School
13 Farringdon School

PRIVATE

9 Business Training Centre
10 Sunderland Training Centre
14 Key Training
16 ITEC
17 Tyne & Wear Chamber of Commerce

The answers to the semi-structured questions were tape-recorded and they are transcribed below:

COMMUNICATION

IS THERE ANY COMMUNICATION BETWEEN YOUR ESTABLISHMENT AND THE LEARNERS' PREVIOUS EDUCATIONAL ESTABLISHMENT TO ASCERTAIN PRE-ENTRY BEHAVIOUR IN IT?

1 No apart from access courses from Colleges - we have

given them an indication of what we need and if they could give us a profile this would be good.

2 No apart from headteachers report.

3 Headmasters report or from the student themselves

4 No - treat them all as if they knew nothing because of differences in calibre from feeder schools

5 Lower years do 35 minutes a week but practically start from scratch.

6 No

7 No

8 Head of first year develops general links with feeder schools

9 No - they come from school and we don't have access to school records.

10 Ask new trainees - should be a report from school or previous YTS.

12

13 Nothing formal

14 No

16 Nothing specific - School references/career services

17 None except to ask them

IS THERE ANY COMMUNICATION BETWEEN YOUR EDUCATIONAL ESTABLISHMENT AND THE LEARNERS' DESTINATION TO ACQUAINT THEM WITH THEIR IT EXPERTISE?

1 They usually go directly into employment. When they go out on work placement (for one year) they know what they need to know. Employers expect IT literacy.

2 No apart from reference from tutor or B/tec grade.

3 Possibly Records of Achievement

4 Records of Achievement

5 Specific qualifications

6 No

7 Not specifically - careers teacher may.

8 Head of careers/Colleges ask for reports on students.

9 If its their placement which turns into employment then very much.

10 No

12

13 Informally when requested.

14 Work placement - yes

16 Yes we contact College/Works experience so that ITEC can keep in touch with the real world.

17 No

WHAT ELECTRONIC COMMUNICATION FACILITIES ARE WITHIN/WITHOUT YOUR EDUCATIONAL ESTABLISHMENT?

1 Modem facilities - SPAN network within Poly and JANET with other educational establishments.

2 Fax, limited network, Prestel in the library. Office networked to the Civic Centre.

3 Network

4 TTNS in the Deputy Head's Office

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5 TTNS in Maths Department
6 Electronic mail to civic Centre - staff use only
7 No - perhaps electronic mail with Civic Centre
8 No
9 Yes - fax
10 Have a modem but not used yet. Network proposed
12
13 No
14 No
16 Commutel, EM, Fax
17 Modem but not used yet, needs a telephone line.

MANAGEMENT

WHO IS RESPONSIBLE FOR DECIDING WHAT COURSES TO OFFER?

1 When a degree is validated it is left to the Quants and Systems functional sub-group to decide the syllabus.
2 Head of School
3 Head of School
4 Head of Department (Business studies)
5 Head of Dept Business Studies or Maths for IT
6 Head of Dept and deputy Head - goes to management team.
7 Head of dept with Headmaster and possibly LEA
8 Head of Dept in conjunction with LEA
9 Manager and Deputy Manager
10 IT trainer
12
13 Head of Business Studies
14 Working parties from Centres around the country
16 Team decision - training staff/training officer/management. Demands from external agents ie MSC/TEC/FE
17 Management receive suggestions from staff.

WHAT ARE THE DETERMINING FACTORS BEHIND THESE DECISIONS?

1 No IT policy statement but IT is spread through staff, students courses but not written down.
2 None but IT committee set up.
3 Progress in IT/perhaps more applications/,ore integrated
4 What other schools are doing
6 Constraints of the timetable as a result of the National curriculum - IT across the curriculum
7 LEA
8 LEA choice of syllabus
9 Imposed from outside - TEC's
10 What can be achieved by the trainees.
13 Use of IT as a tool
14 At least 2 weeks on IT - TEC
17 Expertise of staff/numbers of students

WHAT GUIDELINES/POLICIES ARE ADHERED TO IN IT

DECISION-MAKING?

1
2 HMI/industry standard software
3 TVEI/DTP
4 Syllabus
5 No except LEA
6 DES and IT across the curriculum initiative
7 Very insular
8 AEI Phillips
9 TEC's/political
10 What would be useful to the trainees when they leave - no guidance from employers
13 IT across the curriculum
14 TEC
17 Internal decisions

ARE THERE ANY OUTSIDE INFLUENCES TO THIS DECISION-MAKING?

This question was answered similarly to the one above.

WHO DECIDES ON THE PURCHASE OF HARDWARE/SOFTWARE?

1 IT Tutor/Assistant Head of Department
2 Head of Faculty/Head of Schools
3 Management in consultation with staff
4
5 Head of Department
6 Head of Department
7 LEA
8 LEA Advisor for hardware and Head of Department for software
9 Manager
10 Trainers say what is needed - someone else decides on cost
13 Head of Department
14 Head Office for hardware - software the Manager
16 Ass Manager - requirements of outside organisations and suggestions from staff
17

ON WHAT BASIS ARE THESE DECISIONS MADE?

1
2
3
4
5 cost/user friend/recommendations from colleagues in other schools.
6 cost and relevance to the courses
7 LEA
8 Recommendations from those who have tried.
9 cost - industry/commercial standards
10 The requirements of the course - new developments in IT

13 Price, technical support, use in other establishments.

IS THERE ANY SPECIFIC BUDGETARY CONTROL FOR IT PROVISION?

1 No bids are just put forward for it.
No provision specifically for IT
3 Yes
4 Head controls budget but very receptive to requests.
5 Try to get funds from TVEI - No
6 Each Department has a budget
7 Not aware of any - TVEI influences
8 Each Department has a budget
9 No
10 Yes - budget worked out 12 months in advance
13 Included in business studies budget
14 Yes
15
16 Yes - budget for Borough Tecs
17 No

WHAT IS THE AVERAGE RATIO OF HARDWARE/STUDENT

1 1:1
2 2:3
3 1:1
4 900 students 120 computers Itac 1:1
5 2:3
6 1:1
7 1:1
8 1:1 although they tend not to be on the machines all at the same time
9 1:1
10 1:1
11
12 1:20/1:25
13 1:1
14 1:1
15
16 1:1
17 1:1

WHAT IS THE AVERAGE RATIO OF STAFF/LEARNER?

1 1:15
2 1:12/14
3 1:15
4 1:19
5 1:20
6 1:20/25
7 1:20
8 1:20/25
9 1:16
10 1:10 average 1:6
11

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12
13 1:20
14 1:8 - 1:16
16 Depends on type of course
DTP/CAD 1:2 Accounts 1:2 word processing 1:15
17 1:10

WHO IS RESPONSIBLE FOR STAFF DEVELOPMENT IN IT AND HOW IS IT ORGANISED?

1 Assistant Head of Dept of Staff development generally.
2 Staff development tutor generally.
3 On a School basis - ad hoc probably organised by Staff Development tutor.
4 ITAC Co-ordinator, Head of IT but priority not there for IT - no response - pupils teach teachers
5 head of Maths Dept - ITAC?Business studies fro Amstrad training
6 Head of IT/also TVEI Co-ordinator In-service training days - after school as a result of requests from staff 0- very informal
7 Head of Computing Studies
8 Computer available for use. In-service training days and on an ad hoc basis
9 Manager - no policy but if staff indicate an interest then it will be organised.
10 Staff training remit of the Manager but IT from trainer
12
13 Head of IT - in-service sessions - a computing room available to try things out
14 Manager of the Centre but Head Office offers the course - updating courses offered at centres around the country
16 Management/staff ask/make recommendations
17 IT tutor - staff are invited onto commercial courses - sit in with groups. Tutors are encouraged to use the facilities

WHAT LINKS ARE THERE WITH INDUSTRY AS FAR AS IT IS CONCERNED?

1
2 None as a College
3 None - works experience indicated that similar software was encountered.
4 Nissan - but they are back-peddling now. Flexible learning centre - Enterprise Centre
5 Pupils find their own links for assignment work.
6 Works experience - incidental whether IT
7 None
8 None direct. However pupils undertake work related project for GCSE
9 Linked through work placement

10 No official links

11

12

13 Use of Enterprise centre

14 None apart from placement where they try to copy their software

16 Small companies in the area, larger firms in Scotland and Yorkshire

17

METHODOLOGY

WHAT IS THE AVERAGE NUMBER OF HOURS SPENT ON IT ON EACH COURSE?

1 10% of course minimum probably more like 20 - 30%

2 3/4 hours

3 4 hours per week

4 2 hours per week for CLAIT - Business studies 8 per week.

5 2 hours

6

7 3 1/2 hours per week

8 3 periods of 45 mins each week

9 3 hours machine time

10 half a day a week

12

13 50% of the time

14 75% of their time

16 In a 35 hour week - 25/30 hours on IT according to how far they are through the course.

17

IS A COMPUTER AVAILABLE AS A RESOURCE TO THE LEARNERS?

1 All the labs are open for student use when not timetabled.

2 Yes

3 yes in library

4 Yes after school - 3 nights a week

5 Yes - join in other classes

6 Yes - keyboard club every lunch time.

7 No

8 After school for 1 1/2 hours a night

9 Yes

10 If available

13 Open learning room

14 Yes

16 Yes within the normal working day

WHAT IS YOUR MAIN TEACHING METHODOLOGY FOR IT?

1 Assignments

2 By assignments with tutor guidance/tutor led

3 Tutor prepared notes/hands on experience

4 student centred/work booklets

5 complete an idiots guide - work booklet for each piece of software
6 teacher led but very much hands on
8 work booklets/individual tuition
9 new topic teacher led then through RSA clait book
10 hands on - provision of workbooks
13 hands on - student centred - responding to individual needs
14 student-centred - individual assignments
16 hands on at the workstation
17 student-centred - rely heavily on being able to read - follow through workbooks

DO YOU USE ANY FORM OF CAL/IV?

1 Research assistant doing a Phd on CAL but it has not been diffused into the Department - MBA use CAL on the Accounting course
2 No
3 IV
4 IN in another Dept CAL partly
5 Teach Yourself Supercalc 2 - but not impressed - a little complicated for pupils
6 No
7 No
8 No
9 No
10 No
13 No
14 Yes

IS INFORMATION TECHNOLOGY TAUGHT AS A SEPARATE SUBJECT OR INTEGRATED INTO THE BUSINESS STUDIES CURRICULUM?

1 Metamorphosis - process of getting there
2 First Course yes - National No
3 Partly integrated - fully integrated with NCVQ
4 Integrated
5 Integrated
6 Integrated
7 No
8 Yes
9 Towards integration
10 No
13 Yes
14 Integrated
16 Integrated

WHAT PERCENTAGE OF THE IT INPUT ON THE COURSE IS HANDS ON?

1
2
3 100%
4 50% THEORY 50% practical
5 80%

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6	100%
7	
8	30%
9	50%
10	95%
13	50%
16	Quite a lot

IS THERE ANY SPECIFIC KEYBOARD TRAINING GIVEN TO MAXIMISE INPUTTING SPEEDS?

1	
2	No apart from WP
3	Yes most do keyboarding as an option
4	No
5	No
6	Yes in third year an attempt is made
7	No not enough time
8	No
9	all trainees undertake keyboard training
10	Use typing tutors sometimes. Trainees only come to use the keyboard as a means to an end.
13	Keyboard familiarisation as a module.
14	mask keys/computer program to aid keyboarding - easier if you havent typed before

WHAT COURSEWARE DO YOU UTILISE FOR IT TRAINING?

1	Workbooks
2	
3	CLAIT books/past assignments
4	workbooks
5	workbooks
6	several word processing/typing books
7	previous exercises
8	No
9	CLAIT excellent/outstanding
10	trainer has a selection of textbooks from which material is copied
13	CLAIT
14	Workbooks from Head Office. Centre prepared handouts

HOW MANY HOURS PER DAY DOES STUDENT SPEND AT A COMPUTER?

1	some students all day long - average 2/3 hours per day - computers are available 9 - 9.
2	3 hours per day on average
3	2 hours
4	2 hours
5	1 - 1 1/2 hours
6	2 hours per day - not excessive
7	depending on options 1 1/12 hours approx
9	3
10	2 hours a day
13	1 - 3

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14 Not more than half a day because it becomes tiring

16 5 hours a day

WHAT HEALTH AND SAFETY ASPECTS OF IT ARE INCLUDED ON THE COURSES?

1

2 very little - in the second year consequences of computerisation.

3 left to individual lecturers

4 VDU/dimmer - headaches

5 Induction - eye strain/radiation but we do not frighten them - rest periods at work

6 Initial induction - machine handling/cable management

7 No

9 pupils complete a full module on heath and safety legislation etc.

10 Health and safety at the beginning of the course - electrical equipment and dangers of sitting at screen too long etc. Ergonomics

14 Induction - posture, eyes, hazards

16 They have a general talk on the subject in-house, induction and then on-going

LEARNERS

HOW DOES THE ACQUISITION OF IT SKILLS AFFECT THE INTEREST OF THE LEARNERS?

1 Either like it or don't. Presentation is so important to assignments that they have to use word processing. Harvard graphics will be used more in the future.

2 It can made quite a difference. As they learn it can do things they get quite a buzz out of it.

3 Most like it.

4 3 different rooms of computers. If they are on a NIMBUS they are excited. On the BBC is they get frustrated. They are quite interested in the Amstrads there is no noise in the classroom - they are quite quiet!

5 All very interested - like games

6 Improves interest - particularly lower ability. Take a greater pride in work because of "presentation".

7 very interested

8 Tremendous help - increases challenge. Pupils do not regard it as learning. They do not want to leave the computer at the end of the lesson.

9 Yes

10 Encourage interest - enjoy programming

13 The whole of the course is made more interesting by the use of computers. Helps with discipline.

14 Much more interested on the computer.

16 Lots of them want to learn from the computer. You need to adopt relevance because they switch off

theoretically.

17 Two groups - follow instructions, ask intelligent questions. Varies with software. Like pictorial/graphs/visual aspects.

HOW DOES THE ACQUISITION OF IT SKILLS AFFECT THE ATTENTION OF THE LEARNERS?

1

2 Practical work hold their attention - shuts them up - while they are on the machine the time flies

3 More attentive because of the practical element. Dependent on t he group.

4 Unless they see themselves making progress they will not attend.

5 Varying the lesson - don't become bored. More attentive than a theoretical lesson.

6 Much better but sometimes disappointed initially that they cannot play games as at home.

8 Concentrate a lot more at the machine - normal attention span 10/15 minutes - on a computer 30 minutes - no behaviourial problems - not so much with the girls.

9 yes

10 The more interested the more attentive. Surprising how many come from school without having used a computer. Because they are in small groups they are more attentive.

13 more effective

14 Attention very limited in the first years. blase because they think they have don it at school. They have never learned to touchtype. They have never encountered business packages. They are limited to locoscript at school.

16 Span of attention not very long from school leavers. Its not until they get on the computer that they start to learn.

17 Yes - very interesting in the computer room and they do pay attention.

HOW DOES THE ACQUISITION OF IT SKILLS AFTER THE MOTIVATION OF THE LEARNERS?

1 Much more motivated when using graphics. More motivated with skills based course.

2 frustration factor creeps in sometimes.

3 Relevant for job prospects. Necessary to know how to operate a computer.

4 Can motive but can be a cop out

5 Like to get a print out straight away - like graphics

6 Very much but particularly lower ability. less frustrating word processing.

7 extremely motivating because of the practical element.

8 Girls still like to write - boys use the word processor

9 yes - practical lesson more motivating
13 More motivating
14 Yes because they enjoy it more
16 More highly motivated as long as it is directed. They try to use the software to apply it to them ie their own individual hobbies and they are encouraged because they are learning.
17 some say they hate computers that is boring but there is definite motivation with graphics.

HOW DOES THE ACQUISITION OF IT SKILLS AFFECT THE RELATIONSHIP BETWEEN STUDENTS?

1 They would go first to each other and this would be encouraged.
2 Become vociferous - I'm not playing! Interact with the computer - become absorbed.
3 More movement in the IT room.
4 More one upmanship in the early stages because they relate to computer at home. After that they need to concentrate. Structured situation.
5 Wide range of ability - so they help each other and this is encouraged. Would not be encouraged in a theoretical lesson. Noisy but busy lesson.
6 More included to produce work. Try to discourage pupils helping each other - blind leading the blind. Unless they have proven ability.
7 Much more competitive - keen to be one step ahead of their peers. No so in theoretical lessons.
8 As soon as they discover how to do something they work to show someone else. Help each other.
9 More intercourse between students when using computers.
10 Encourage helping each other
13 Encourage them to help each other and to learn as a team.
14 They are pretty good at helping each other.
16 They help each other a lot. They would rather ask each other.
17 Yes lots of interaction - trainees help each other and this is good because they are using their knowledge effectively. Get involved in the resource material.

DOES THE ACQUSITION OF ITS SKILLS HAVE ANY SOCIAL IMPLICATION?

1 Always work in groups. One of the benefits of not having enough computers.
2
3 Encourage learning from each other - not isolated when using a computer
5 None
6 If they can show a degree of confidence in the computer they could be looked up to.

7 Yes because very keen to help each other. Much more sociable.
8 The layout of the room is important - no teacher at the front.
9 Does not seem to.
10 Not really
13 Builds confidence.
14 Would not help each other as much in the normal situation but do on computers - no superiority.
16 Not really - more involved if they can do it.
17 Social implication of technology ie technology in the home - hi-fi - this helps their interest.

HAVE YOU EXPERIENCED ANY PROBLEMS WITH IMPLEMENTING IT IN THE CURRICULUM AS A RESULT OF RELIGIOUS/ETHICAL REASONS?

3 Jehovahs witness
9 Plymouth brethren

ASSESSMENT/EVALUATION

WHAT FORM OF ASSESSMENT DO YOU USE FOR THE ACQUISITION OF IT SKILLS?

1 Continuous assessment through assignments - not marked SOLELY for IT though.
2 Observation/work produced for assignments.
3 Practical assignments
4 Profile sentences
5 Practical assignments
6 Practical assignments
7 Practical work and profiles
8 Check sheets
9 Examination/performance criteria
10 Demonstrate to trainer
Completion of Assignments for RSA
Completion of Exam for City and Guilds
13 Not specifically on IT
14 Profile sentences as per DOPs
16 Assignment based work/NROVA assessment Performance criteria and requirements of examination bodies.

WHAT FORMS OF SELF-ASSESSMENT FROM THE LEARNERS VIEWPOINT DO YOU INCLUDE ON THE COURSE?

1 Not in a structured way but perhaps by comparison with their peers which is not ideal but contemplating a self-test.
2 Not formally but instant feedback from the practical aspect.
3 If they can do it they know.
4 Negotiation of profile sentences
5 Progress sheet ticked off themselves prior to CLAIT
6 The fact that they have created/printed the document
7 None except from negotiation in profiles.

8 Success of Assignment work - very critical of themselves.
9 Self assess at the end.
10 Yes exercises to check to see how well they have done.
13 Handout explaining what is acceptable and the standard to be reached to be "ticked off" by the teacher.
14 Assessment sheets
16 Not as much as we could do. Marking - show when you have gone wrong.

HOW DO YOU RECORD THE ACQUISITION OF IT SKILLS IN YOUR LEARNERS?

1 Not recorded separately from Assignments. IT skills are integrated because it would be like teaching handouts.
2 As part of the Assignment profile - work produced. Process and product.
3 Immediate feedback on students work.
4 Profile sentence leading to record of achievement.
5 Personal progress records.
6 Not recorded at the moment apart from RSA profile for Clerical.
7 Record book as to how much they had covered.
8 Records of Achievement
9 Assessment records.
10 Kept for 12 months
13 Handout explaining what is acceptable and the standard to be reached to be ticked off by the teacher.
14 Register of work, record of achievement, true negotiation, grades from work placement.
16 NROVA sheets.

HOW IS YOUR COURSE(S) EVALUATED?

1
2 Overall results of exams/grades/team meetings at the end of the year.
3 Student success - constant monitoring
4 Not by exam results. Subjective feeling of pupils/staff. The first four weeks are all important.
5 Just follow the syllabus.
6 External examination results GCSE, CPVE initially.
7 None as yet
8 Analysis of results - pupils response - quality of the assignment.
9 NVQ is just in operation - Pitman now.
10 Talk to trainees afterwards. Compare groups particularly mixed ability. Perhaps change material or way of delivery.
13 Under constant evaluation
16 Externally - number of people who get jobs and

success in examinations.

APPENDIX 19

SYNOPSIS OF NOTES MADE DURING OBSERVATION OF INFORMATION TECHNOLOGY LESSONS

SOUTHMOOR SCHOOL - 11-05-90

6 boys
6 girls

Itching to start on the computers
Lots of interaction
Pupils do not listen - teacher has to repeat instructions.
Boys and girls don't want to sit next to each other.
Lots of noise.
Pupils do not like sitting on their own and when asked to sit in a certain place a boy moved back to where he wanted when teacher was not looking.
Working from CLAIT assignments
Computers very close together Work to be copied on pupils laps or lying on keyboard.
One girl sat with keyboard on lap.
Teacher in great demand coaching individually.
Teacher cross with one student because she omitted to save work and teacher demanded "If your stuck ask me not Gayle!"
Girls marginally quieter
No touch typing!
Very attentive, motivated and seemed to enjoy it.
When a a pupil was having particular difficulty teacher sat by her and took her through the work in a step by step process
Blaming machines a lot

SUNDERLAND POLYTECHNIC - 03-04-90

Very relaxed atmosphere but a very crowded room
- possibly about 35 students - 3/4 to a machine.
Asian student was working away on her own while the others were working in groups.
Teaching very laid back. Aim of lesson seemed to be to clarify how students should attempt a group project. Lecturer asked each group to report progress but this was in a very haphazard and unstructured way. Some groups chatting whilst another was reporting back. No definite gender issues. Groups were mixed quite well though it was impossible to tell if these had been prearranged or were simply made up of students who wished to work together.

Some students used machines, others simply looked at notes.

Much more evidence of the computers there as a resource.

However extremely dismayed when 2 decorators entered the crowded room with stepladders and equipment in order to

repair the ceiling. It seemed as if it was water leakage and no attempt had been made to remove the computer equipment. Students simply shuffled ever closer together so workman would climb on workstations to fix the leak!

Good thing? - students assignment work handed in on disk for lecturer to check soft copy from his own computer in the staffroom - sign of things to come?

BUSINESS TRAINING CENTRE - 17-05-90

Day release 2nd year - employed status - CLAIT spreadsheets

3 boys
5 girls

3 boys together
2 girls together
3 girls together

3 boys worked quietly and attentively. Group of 2 girls stuck so they chatted together
3 girls very vociferous talking about everyday issues.
When girl stuck trainer asked her to refer to handout.
Trainer actually sat by female students when assisting.
Trainer keyed in for male student when he was having difficulties.
Although trainees had only been doing "spreadsheets" a few weeks, one boy was printing out graphs.
3 Girls - one took over the other's keyboard to key in for her.
One girl looking for £ sign simply used trial and error on the keyboard. Extremely frustrated when not able to find it.
One trainee did not want to replicate and refused to do so saying she preferred to put @Sum in every cell.
Boys much more reluctant to ask for help.

HOUGHTON KEPIER - 01-05-90

Busy on spreadsheets - CLAIT assignments.
Not the quiet room one would expect.
"Leave her - help me!" they shout!
Very vociferous/chatting about week-end.
Vying for the teachers attention - Sir! Sir!
When one pupil asks the teacher a question other students ask another while he is replying to the first.
Constant interruptions.
Boys more vociferous than girls, 3 girls 4 boys split evenly
Methodology - individual coaching. More time with "rowdy" element.

Nobody touch typing. Teacher in constant demand. Even with a few students constant attention needed. Pupils asked teacher to check work.
Competitive - one pupil had completed one extra assignment and felt this was very unfair.
Marking - as hard copies produced.
Highly motivated because of computers
Pupils quite willing to get up and ask peers. When help was given in this way the helping pupil tended to physically press the keys for him!

WEARSIDE COLLEGE -18-05-90

Group of secretarial students - all female - some mature. They were waiting anxiously to complete an Assignment for their CLAIT course and some of the class were late. Very organised, very structured learning. Instructions for spreadsheet work clearly displayed on whiteboard. Very organised, little interaction probably because of the nature of the day.

BIDDICK SCHOOL 05-4-90
Group of fifth years - mixed in gender - extremely vociferous. Lots of interaction both with each other and teacher. Whether my presence influenced them but tended to "show off" a bit. Asking teacher questions all the time which she kept fending off with "look it up" "refer to your workbook" etc. Impression of not wanting to be disturbed by them. More a sense of trying to control and keep occupied rather than teaching. Teacher quite sarcastic with some pupils although the pupils were not upset by this - in fact - seemed rather to enjoy being the centre of attention. Pupils continually wanting feedback from teacher on how well they were doing. Always looking to each others work to check their own rate of progress.

USWORTH SCHOOL 06-04-90

Very haphazard arrangement of rooms. Very open plan. Computers in a series of interconnecting rooms with teacher running between them. Also another teacher appeared to be having tutorials with other groups of students in the room. The Business studies students were "doing their own thing" either playing games or using desk top publishing. The teacher appeared to be merely "minding" or "keeping them occupied.

Seemed mainly to be boys.

SUNDERLAND TRAINING 18-06-90

An extremely small group of mature students. Accommodation not good, merely a partition of a large room. Very small and cramped. Students extremely quiet, all male - doing their own thing. Very little interaction with each other or with tutor.

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SANDHILL VIEW 12-07-90

A group of "remedial" students using computers. Teacher admitted that it was to "keep them busy" and was mainly word processing. She had a series of tasks for them to do and they seemed to enjoy it. Lots of interaction between the pupils and with the teacher although she did not encourage it. Definite antagonism between the Business Studies lecturer with her Amstrads and the IT teacher with his Nimbus. No collaboration whatsoever. They did not know what software the other one had!

FARRINGDON 18-05-90

Much more structured. Pupils using Amstrads. Teacher seemed jealous of the Nimbus networked rooms and did not want to discuss them. Definite gender influence - boys with boys - girls with girls. However, noisy, vociferous, clamouring for attention.

KEY TRAINING 25-06-90

Quite a laid back approach - students doing their own thing from workbooks or working on their individual assignments. No gender issue - all females. Not very much interaction, tutor admitted most teaching was from workbooks.

SUNDERLAND ITEC 25-05-90

Absolutely huge room filled with all kinds of hardware and utilising all kinds of software. Best equipped centre yet observed. A number of tutors operating in this huge area. It looked rather haphazard but trainees and tutors seemed to be able to define their parameters. Apparently there was also a tutorial room where groups could be taken for "theoretical input". Seemed to work very well. Not very much interaction - everyone concentrating furiously on their computer and their own applications.

TYNE & WEAR CHAMBER OF COMMERCE 10-05-90

A group of mature men on a short IT course who had recently been made redundant and were wanting to update their skills. Although not very articulate the trainees were extremely interested and questioned the tutor continuously when points arose which they did not understand. Tutor well able to cope with situation, seizing on their interest in health and safety go into the subject in greater detail. Room well organised and lesson very structured. Good interaction between trainees and tutor. All men so no gender implications.