University of Surrey
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FASHION STUDENTS' TEXTILE SOURCING SKILLS USING THE INTERNET AND WORLD WIDE WEB.

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July 2003

Thesis submitted in partial fulfilment of the requirements of the degree

Doctor of Education
Acknowledgements

I would like to thank the following people who have contributed to the completion of this thesis:

Peter, Natalie an Maxim Gaimster for their patience and support

Dr. David E Gray

Dr. Gareth Parry

Dr. David Hay

Susan Orr

Jill Brewster

The students who took part in the study, Friends and colleagues at the London Institute and the London College of Fashion and others too numerous to mention, they know who they are.
Abstract

The fashion curriculum is an under investigated field of research and the role of the Internet in fashion education is an area in which no substantial research has already been undertaken. This thesis explores the issues faced by fashion students when they are sourcing textiles using the Internet and the World Wide Web as research tools. This research also investigates whether these tools are effective and useful in the sourcing process. The findings show that the Internet and World Wide Web have great potential to meet the textile sourcing needs of students but that there are a number of factors that need to be taken into account. There are many barriers that prevent fashion students from using these tools effectively.

The Internet is a complex domain and the students in this study required a wide range of skills and knowledge in order to be able to conduct an effective search. They also need to have the appropriate levels of confidence and experience in using information technology (IT) and access to the Internet. The range of knowledge that students require to be effective includes knowledge of the subject domain as well as knowledge of computers. However, the attitude of the industry toward fashion students seeking to improve their subject knowledge is often negative. The information seeking skills of even the most experienced users of the Internet were found to be underdeveloped and this led to ineffective strategies being employed. This thesis offers recommendations for educators wishing to use the Internet as a research tool and the various pedagogical theories that have been applied to learning on the Internet are related to the findings of the study. The findings, whilst directly relating to students of fashion, are reflected in studies in other disciplines and should therefore be applicable to a wider population.

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Chapter 1  Rationale

Introduction
The first four chapters of this thesis set the context for the research and review the literature that already exists in the field. This chapter will present the rationale for undertaking the research and will give an overview of the literature relating to fashion education.

The motivation for the study
The motivation for this study arose from the professional experiences of the researcher, who has worked for 15 years in fashion education at all levels from BTEC National Diploma to BA Honours Degree. Over this period of time the number of hours available in which to deliver the curriculum have slowly been reduced from a full 30-hour week in 1987 to 12.5 hours per week in 2002. This reduction in taught time was accompanied by an increase in class sizes and an increase in the number of non-traditional entrants to higher education. The Government White Paper on Education 2003 indicates that this trend is set to continue.

The demands of the curriculum continue to change as the fashion industry moves from traditional to computer based technology. Production is increasingly moving “off shore”, requiring companies to think about electronic communication. The student body is expected to spend an increasing amount of their time in self-directed study and utilising open access facilities. The researcher is also aware of an increasing number of students who have financial difficulties and problems with committing themselves to full time attendance.

In 1995 the researcher was invited to join the computer group at the college where she was employed and began to think about the possible role of computers in resolving some of the problems that her students and tutors were facing. The original idea had been to try and develop some elements of the curriculum that could be studied at a distance or in the students' own time. However, to try and tackle the whole of the curriculum would have been impossible so it was decided to focus upon fabric sourcing. This was an area in which it was evident that the students had difficulties. It also required them to engage in independent research.
In the process of conducting the research necessary to formulate the proposal the researcher discovered that the fashion curriculum had not been subjected to the kind of debate and research that is common in other areas of education. The Internet was also a relatively new phenomenon and certainly there had not been an investigation of its role in the fashion curriculum. This led to the decision to undertake this research. The developments in higher education and the fashion industry that are the drivers for this research are examined in more detail in the rest of this chapter.

From Elite To Mass Higher Education

Between 1980-1 and 1992-3 student numbers in UK Higher education rose from 640,000 full-time equivalents to 1,128,800 (Ghosh and Rodgers 1999). As a result of this expansion class sizes in UK higher education have increased and in order to maintain standards lecturers need to find innovative ways of teaching and assessing (Gibbs and Jenkins 1992). In fashion education the content of the curriculum has also grown. The modern fashion industry demands that students not only have design and technical skills but also appropriate interpersonal, communication, business and IT skills. Fashion is a practice-based subject where there is a tradition of studio-based delivery with fairly small group sizes (18-20). The curriculum model in fashion education was often based upon the master apprentice approach where learning took place by an induction to the techniques through demonstration by the expert tutor and practice by the novice learner. The methods used involve studio based demonstrations to small groups and one to one tutorials and critiques. This approach is common in art and design subjects and is clearly described in Schon's (1987) work on the reflective practitioner which examines the training of architects. Mass participation and the impact of technology have had and are continuing to have, an impact upon what is being taught in the fashion curriculum and how it is being delivered. This is not unique to fashion education but is also true of higher education as a whole.

Gibbs and Jenkins argue that "the traditional pattern of frequent and intensive interaction between teachers and students on a one to one basis has already been lost and cannot be regained." (Gibbs and Jenkins 1992). This change has been driven by pedagogical and financial factors. Dearing (1997) highlighted the funding difficulties that higher education is facing and outlined the need for programme teams to continue to provide quality programmes despite
reduced unit costs: this is one of the major challenges facing educators in the new millennium. Dearing (1997) recognises that the increases in efficiency in UK higher education have been achieved, in part, by under investment in infrastructure and that pressures to reduce costs may in the long term damage the quality of the learning experience and lower the morale of the staff.

Higher education is also being asked to consider alternative modes of study and ways of widening participation by non-traditional groups of learners. Information technology (IT) is seen as having a key role in this expansion (CHEAD 1996; HEFCE 1999/60) enabling students to engage in distance learning, resource based learning and part time modes of study. Internet based study offers a more flexible approach than traditional methods of face to face teaching in that the student can choose the time, the place and the pace at which they study (Fayter 1998). This flexibility links into another driver for change, the emphasis in educational research on a move from teaching to learning (Barr and Tagg 1995; Forsyth 1998). This change in emphasis brings with it an expectation that students will undertake more self directed and independent study and utilise resource based learning (Beswick 1977; CHEAD 1996). There has been no systematic research into how effectively fashion students have been dealing with this change in study patterns or which resources are most useful to them. There is an increasing pressure to find ways to deliver the fashion curriculum in fewer hours, fewer resources and to more students, whilst still maintaining quality. It is unlikely that fashion programmes will have an increase in taught hours in the future. Therefore it is necessary to try and develop new ways of delivering some aspects of the curriculum.

The widening of access and participation in higher education is considered desirable if we are to compete in an increasingly global market (Bates 1995; Owston 1997; HEFCE 2000) and the old systems of education which were relevant to an elite do not transfer comfortably to mass higher education (Bates 1995). The employment market that students will be entering will also be different. Graduates can no longer expect to have a job for life, they may have a portfolio of different careers requiring that they are versatile, update their skills at regular intervals and have a lifelong approach to learning (Bates 1995; Vogel and Klassen 2001). The speed at which the technology is changing also makes it important for learners to be able to “learn to adapt to new technologies without continual intensive training” (Phelps, Ellis et al. 2001, p 482). It is argued that the Web is a useful tool in moving from teaching
to learning and broadening access (Owston 1997). However, many students seem not to be taking advantage of, or have been put off using, the technology that we are striving to make more available to them (Jeffries and Hussain 1998; Selwyn, Marriott et al. 2000). It is widely argued that we are moving into an information society (Walker 1998; Bruce 1999) and students who cannot or do not wish to participate will be disadvantaged.

Having looked at the broader context of higher education in the UK the next section will consider the specific context and development of the fashion curriculum.

The Fashion Curriculum

This section will describe the main issues relating to research into the contemporary fashion curriculum as described in the literature. It is not an attempt to present an in-depth history of the development of the curriculum but to highlight the points raised in the literature that are pertinent to this investigation and to situate the fashion curriculum within the field of art and design. The fashion industry is unique in the way that it is driven to satisfy the desire of the consumer for new products on a level of frequency that would be unsustainable in many other industries. Computers in general and the communication opportunities provided by the Internet in particular have played a critical role in facilitating this speeding up of the supply chain (Colussy 2000). Computers have had a huge impact upon the way that the fashion industry operates and yet there has been little debate about their role in fashion education. In many courses they are still an add on to the curriculum. This lack of debate is not surprising given the general context of fashion education within the academic world.

The notion of art, design and fashion education as a subject for research investigation is a recent one. The majority of the pertinent literature is focused upon art and design as a generic area rather than fashion in particular. This situation is beginning to change driven partially by the Research Assessment Exercise (RAE). Art and design was included in the RAE for the first time in 1992 (Richards 1999). A body of fashion educators who feel the need for their subject to be taken seriously is also beginning to develop. This has resulted in the formation of subject interest groups within some of the art and design associations.
Perhaps the most enlightening study to date is Mc Robbie (1998), which is focused upon the experiences of new fashion graduates entering the industry. She gives us an historical picture of the development of the current landscape of fashion education and points to the problems that fashion departments have in being taken seriously as an academic subject. This she attributes to the feminine nature of the subject area, the lack of formal qualifications held by the lecturers and its close links with industry.

Fashion also has an identity problem in the context of the wider world. This is noted by Sandford, (1997)

Unlike many other creative activities such as literature, fine art or film, fashion and textiles appear to have a slim history of critical discourse accompanying it. The mass media seems to prefer either straight reportage or sensationalism especially when dealing with fashion. (Sandford 1997, p 40)

There is not a long tradition of fashion educators and practitioners writing and publishing about their practice as one will find in other disciplines (Sandford 1997; Taylor 1997). This is coupled with a lack of respect for fashion as an academic subject and Mc Robbie (1998) says that this has led to its subordination within the academic community making it difficult for fashion educators to achieve parity with other disciplines in the fight for resources. Taylor also points out that museums and “academic male social historians, economic historians,” (Taylor 1997) could not understand fashion and its commercial relevance. It may just be these commercial connotations of the industry that have affected the reputation of fashion as a serious academic subject as a respondent in Mc Robbies’ (1998.) study says:

We’re Tesco’s window. The cream on the cake. Fashion gets more attention than any other area. But even at the RCA fashion did not get degree status to begin with. My head of school was certainly of that opinion, that fashion isn’t really degree level work. There is plenty of admiration for the funds we raise and the publicity, but in academic terms it’s not easy to be taken seriously. It’s a sexist thing. It’s OK for graphics and for illustration but fashion is female dominated. Industrial design is also OK -, but fashion design is ephemeral. (Respondent G) (McRobbie 1998. p 41)
It is the case with many art and design courses that the lecturers are mainly practitioners who are hired for their subject expertise as opposed to their academic background and many are not trained to teach but continue the traditions by which they were taught (Prentice 1995). This lack of an academic and written history by fashion educators and practitioners is reflected in the relative absence of the voice of fashion educators in research journals. There are many papers relating to the technical aspects of textile and garment production or marketing but exhaustive trawling of citations and indexes has produced no more than a handful of documents, usually relating to conference proceedings or government policy, that relate to the fashion curriculum.

So is there a focal point for the voice of UK fashion education? There is the British Fashion Council, (BFC) who run a college forum for degree courses that helps promote links with industry and they organise London Fashion Week. This attracts much press attention. In 1998 the BFC held a conference on the designer industry. The usual complaints about a lack of support from the Government and industry were made. The industry blamed the fashion colleges for producing too many design graduates and the colleges complained that the government had created a competitive environment where they had to offer courses that would attract students. Many of these potential students unfortunately do not seem interested in the more technical aspects of the industry.

The main emphasis of the debate in these forums is about the links between the industry and the skills (or lack of skills) of the graduates being produced by the educational institutions. There has been very little debate about pedagogy, about how fashion students acquire skills or even about how they are going to acquire the new skills that the industry is now demanding.

Toward the end of the twentieth century there was a movement to correct this situation with the appearance of organisations such as:

- Computers in Art and Design Education (CADE), formed in 1994 their first conference being held in Brighton in 1995.
- The European League of the Institute of the Arts (ELIA) who invited art
and design institutions to organise specialist conference workshops in 1996.

These organisations have helped to raise the profile of research in art and design education but there is a lot of ground to be made up to bring the subject into line with other disciplines. It is clear that if fashion is to move into the mainstream areas of academic debate then educators and practitioners are going to have to participate in the literary forums that already exist and to develop a strong research discipline in their subject domain.

Design versus technology
There has been increasing criticism by the industry that there is an over emphasis in many fashion programmes on design components at the expense of technical expertise. Vanessa Denza, one of the founders of Graduate Fashion Week (GFW) and a long time commentator on British fashion education, has strong views on the number of design graduates now being produced.

*Actually how many of our designers do you think are able to work as designers? Have they got the ability? Are you able to teach them the skills that are necessary? Design courses are very expensive to run, would it not be perhaps better to start thinking of spending money in slightly different ways? (Denza 1996, p 30)*

Mc Robbie (1998) theorises that the British Fashion industry was developed in response to consumer demand. She argues that the fashion curriculum that was offered in technical colleges and non-degree awarding art colleges fell victim to the decline of the manufacturing industry in the UK. This has lead to the current situation where there is an over abundance of design degree programmes. Roworth (1997) feels that the situation was compounded by the reorganisation of the UK’s educational system. She argues that when self-funding was introduced it became necessary for institutions to increase their student numbers in order to survive. This in turn led to an increase in degree programmes, which were deemed to be more attractive to students than the more vocationally oriented HND and City and Guilds programmes.

Some of the staff currently in fashion education have been in post for many years. It may be that some are reluctant to change traditional practice and
others are struggling with how to incorporate the new technology in an already overcrowded curriculum. They could be struggling to find a balance between traditional skills, technical expertise and new technology. The balance between traditional craft techniques and new technology has been the subject of debate in many fashion departments, both here and in the USA.

Fashion departments have been driven toward the incorporation of technology within their programmes by government policy and the validating bodies. The former CNAA and BTEC were almost prescriptive in their drive toward technology in art and design (Aldrich 1990). This was somewhat against the grain for fashion programmes which “...have proceeded along autonomous paths working within an ethos in which individualism was generally encouraged”. (Aldrich 1990, p 2). This pressure to absorb the new technology sometimes led to the purchase of high specification equipment that was rarely available to students or ended up gathering dust (Aldrich 1990; Roworth 1997). Aldrich (1990) also criticises colleges for being afraid of having too much technical and theoretical rigour within a course. She believes that colleges should be honest about the amount of technology within their courses.

Roworth (1997) echoes the criticisms of Denza (1996) about the number of graduates being encouraged not just into fashion but also into art and design as a discipline. Roworth (1997) finds an irony in the fact that whilst the Government is having difficulty in encouraging students into the science and technology courses, an understanding of science and technology has become essential in the textile fashion industry. Roworth also makes a connection between the health of the UK fashion industry and the continued survival of our reputation for fashion design education arguing that the leaner, fitter operations will survive and that:

*Unless the colleges can offer this industry design graduates with the skills they require, then it is understandable if they are viewed as vast amoebas, spreading and multiplying for no purpose other than to confuse students as to what the real world is about. (Roworth, 1997, p 17)*

Howard (1997) feels that there may be room for some colleges to continue with the old traditions and curriculum but in order to survive, most are going to have to embrace technology. This, she says, is already happening in the USA where students are recognising that employers are looking for computer skills.
Students are being proactive in selecting programmes with a strong element of technology and computer skills. Colussy (2000) stresses the importance of good sourcing skills in the role of the professional designer and the recent shift in emphasis from manual to online sourcing. This shift she says has been one of the drivers that have enabled designers to "...react more quickly and more accurately to their consumer demands, they are also able to do so with fewer and less costly expenses" (Colussy 2000, p 206). She identifies the influence of the computer as one of the reasons why the competition in the retail environment has become so fierce. In order to be competitive in this climate it is clear that graduates will need good online sourcing skills. Fabric sourcing can be a difficult task even for the professionals in the fashion industry as Paul Russo of FabricPro.com says "The difficulty of sourcing fabrics has long been underestimated, except by those who actually have done it." (IFAI 2002). He goes on to explain why the activity is so complex.

*Fabric researchers in a fashion business are typically charged with sourcing a variety of specific fabrics in a short period of time. They must deal with the aesthetic demands of designers and customers, cost restrictions, time constraints, shifts in production from one part of the world to another, plus they must keep up with rapidly changing fashion trends and new products.* (IFAI 2002)

Students who are able to develop and practice these skills will clearly be better equipped to function in this extremely competitive environment when they graduate.

The Dearing Report (1997) places particular emphasis on the need for IT skills, communication skills and numeracy. In an information based culture information handling skills are also going to be important to graduates of all courses including fashion (Swann,1996). Fashokun (1998) points to the need for a more inter-disciplinary approach. Fashion, computer and graphic design have traditionally been taught as separate skills. She argues that there needs to be greater communication between disciplines in order to produce graduates who can deal with the developments in new technology.

The integration of technology has not always been easy and as stated earlier there is a debate about the balance between traditional and technological skills within the curriculum.
Now, what’s happened is that another battle has started in United States education - in addition to trying to teach design you’re having to teach the technology of designing, which means there is yet another pressure on how much time you can spend teaching design because you have to teach, how to use Photoshop Software in addition to learning the fundamentals of design. (Howard 1996, p 33)

Employers are identifying that the skills that they will be seeking in graduate employees are going to change as Brian Godbold (1997), (Divisional Design Director), Marks and Spencer states that:

Our needs are going to be very, very different; there’s the whole technology thing which is going to be very, very different, all these things for young designers are going to make what we grew up with and were taught in terms of designers very different; of course you need the basic skills there, but the scenario is so much wider. (Godbold, 1997, p 28)

How much influence the needs of industry should have on the content of the fashion curriculum is a subject of continuing debate. Graduates want to leave college with the necessary skills to gain employment in an increasingly competitive field. In an industry that is continually changing the skills required by graduates entering that industry are also changing. Educational change and the development of new curricula move at a slower pace. The danger is that by the time we have implemented what the industry says that it needs, the industry has moved on (Wayman 1998). Wayman argues that fashion and textile educators need to develop their own voice and not merely respond to the demands of industry and government.

The role of reflection and communication in the fashion curriculum

In addition to technical, IT and other subject specific skills, there is a need for students to become more reflective practitioners in order to be able to cope with the demands of a curriculum that is moving in emphasis from teaching to learning. The need for student designers to be able to reflect upon their practice is recognised and established (Schon 1987; Prentice 1995). Prentice (1995) highlights the need for good communication skills to enable this process and states that, “central to successful reflective practice is the ability to make explicit those aspects of professional practice that too often remain implicit.”
The role of dialogue in the articulation of ideas has been identified by Pask (1975) who argues that engaging in dialogue enables the learner to make their ideas explicit. High quality dialogue requires a sound underpinning vocabulary of both general and specific terms relating to the subject domain. This enables the student to engage in communication with the experts in their field and to express their intentions in their designs. Students need to find ways to express themselves verbally as well as visually. The need for access to a technical vocabulary is especially important when dealing with fabrics. As Shreeve, (1998) points out, a lot of decisions about selection of fabric are made tacitly or through the sense of touch and are difficult to articulate verbally. Touch and tacit understanding are not easy to translate into an enquiry or an order to a supplier. There is also a tension between the tactile nature of clothing and the cold hard edge of digital technology (Fashokun 1998). In order to use the Internet and other technologies for sourcing, the student will need access to the right vocabulary and confidence in expressing their needs. The Internet is still primarily text based and students will need to utilise words to describe what they are looking for rather the usual method of feel and touch. This is difficult for them if they have not established the appropriate vocabulary. This vocabulary needs to be supported by an understanding of fabric properties, characteristics and end uses. Denza (1996) criticises fashion students' lack of understanding of fabrics saying that "designers are not understanding fabrics, how fabrics work, what fabrics to use in what design." (p 30).

In order to access the full potential of the Internet, students will need a sound vocabulary of technical terms and underpinning knowledge of fabric properties and characteristics. They will also need access to the vocabulary to describe these characteristics. This will entail a shift in emphasis from tacit to explicit knowledge.

As in many other disciplines in higher education, tutors in fashion are not embracing change as enthusiastically as they could be. The reasons for this are investigated in Chapter 3. However, the traditional methods of teaching will not be sustainable in the new educational environment where there are increased numbers and different expectations. Fashion has a difficult time being taken seriously as an academic subject, partly because of its feminine and industrial connections and partly because of the practice based nature of
fashion academics (CHEAD 1996; McRobbie 1998.) The lack of a developed literature covering the field could be attributed to a combination of these elements.

There have been many theories as to why there is a lack of integration of IT within the curriculum. It seems likely that it is due to a combination of factors including:

- a lack of funding to supply HE programmes with appropriate and up to date equipment (Devane 1994);
- a lack of subject based tutors with IT expertise (Aldrich 1994);
- the marginalisation of computer studies outside the core curriculum (Aldrich 1994);
- a lack of understanding of the need for investment in CAD/CAM training for fashion students amongst college managers. (Taylor 1990)

Although CAD is being introduced into the fashion curriculum there are at present few subject specialists in fashion education who have extensive experience of utilising technology within their teaching (Taylor 1990; Phillips 1997) or of the theoretical paradigms underpinning the effective use of technologies. It has been the practice for those employed in fashion higher education to be employed for their professional practice or research interests. It is only very recently that the government in the United Kingdom has recognised the need for lecturers in higher education to have a teaching qualification at all (Dearing 1997). If the fashion curriculum is to keep pace with the changes in the industry it is important that subject specialist in higher education develop an understanding of how technology can be used to enhance the curriculum.

The fashion industry is entering a period of increasing globalization driven by new communication technologies. In a retail environment that is dominated by multiple chains and offshore production the computer plays a key role in supply chain management. The global nature of the fashion industry and the speed at which the supply chain works makes it particularly reliant upon communication technology (Wilson 2001). This evolution in communication technology has not been satisfactorily transferred to fashion education. The ability to be able to use communication technologies effectively is a skill that more and more employers are demanding (Jones and Parrish 1999). Today's fashion student will be entering an industry where it is normal to source the components for a garment from a variety of countries across the world. They will need to be
comfortable with the technology that is driving this change and be adept at communicating and negotiating at a distance utilising a range of technologies. Students come to higher education in fashion with varied experience in using information technology and the Internet.

This research will seek to gain an understanding of the different ways in which students relate to the medium. It will also examine the extent to which the Internet is a useful media for research in fashion with a specific focus on fabric sourcing and selection. The topic has been chosen because many fashion students have particular difficulties with this area of research, especially when trying to source from wholesale suppliers. Fabric technology is advancing very quickly and the range of fabrics now available is growing by the day. Phillips (1997) points to the integral role that the fabric plays in the successful production and marketing of a garment.

In the fashion curriculum, lecturers are trying to develop a "deep approach" to learning where students are able to integrate and transfer skills from many subject areas in order to solve complex problems. The concept of deep and surface approaches to learning was first identified by Marton & Saljo (1976) these approaches are summarised by Haggis (2003) as follows:

...quantitative, memorising and acquisition conceptions underlying a 'surface' approach (in which the student's intention is to memorise the text), and abstraction, understanding reality and developing as a person underlying a 'deep' approach (in which the student's intention is to understand the meaning of the text). (p90)

Taking a deep approach requires the students to have a strong knowledge base and a clear understanding of the properties and characteristics of fabrics so that they are able to select an appropriate fabric for the function of the garment they are designing. It is the experience of the researcher that fashion students often have problems in their project work because they lack sufficient knowledge of fabrics to be able to make informed decisions about the fabrics they are selecting.

Many educators are apprehensive about the role of computers in education. They are wary that the learning that is taking place is superficial and more to do with presentation than content and students may be using software
to manipulate ideas without engaging in deeper exploration (Pilkington and Parker-Jones 1996). The fashion curriculum has a strong practical orientation and it is very unlikely that computers will take over all the roles of the experienced technician or designer (Hendley 1996). However, they could be useful tools for research, design development and for supplying students with some of the basic underpinning knowledge and facts that tutors may no longer have time to impart.

Initially the fashion and textile industry was slow to respond to the commercial opportunities offered by the Internet. However, the number of fashion and textile sites is growing. Some of these are very informative and offer resource data bases and information about fabric structures, glossaries of terms etc. A unique aspect of the Web is the opportunity that it provides for access to up to date information of a global nature. The question is can these new resources be used to enhance the students' understanding and ability to source fabrics?

Summary
A review of the literature showed that there is a very limited culture of research into fashion design. Most of the existing literature about fashion is contextual or historical in nature (Taylor 1997). It is only in recent years that design practice and fashion education have been considered legitimate areas for research so the field is almost completely uncharted. There is, however, a great deal of literature concerning computer and Internet based learning in other professions and areas of education, which have been used to inform this research. This research study can help fashion educators to develop an understanding of where the Internet can be useful in the fashion curriculum.

The next chapter will examine the nature of the Internet, why we need the Internet in education and the practical and pedagogical benefits it may offer to lecturers and students.
Chapter 2  Why we need the Internet in Higher Education

What is the Internet?
The Internet developed out of an American military project started in 1969 by the Department of Defense and Advanced Research Project Agency (ARPANET). The Internet is basically a network of computer networks. The Internet allows users to communicate in a variety of ways. It is possible to use a range of protocols to communicate across the Internet and transfer files. These files can take the form of text, images, sound and video. File Transfer Protocol (FTP) is used to up-load and download files and Simple Mail Transfer Protocol (SMTP) is used for routing email (Judson 1996).

The Internet has grown at a phenomenal rate by 1996 there were more than 23 million users and 9 million hosts. A group called the Internet Engineering Task Force (IETF) oversees the evolution of the Internet and is responsible for the definition of the standards that enable computers and software to communicate with each other (Conner and Krol 1999). Most individual users currently use a modem to connect to the Internet. The speed at which information can be transferred is limited by the speed of the modem at present usually 56k although broadband options are now becoming more widely available.

The most popular aspect of the Internet is the World Wide Web (WWW). The Web, as it is commonly known, has a graphical Interface and can incorporate animation, sound and video. It is the potential for creating a multi-media experience that makes the Web an attractive medium for teaching and learning in art and design (Ordish 1996). There are millions of sites on the Web from those set up by individuals to large corporate and government sites. This makes it the world’s largest source of information but this in itself creates problems. The source of the information may be unreliable, and finding the information can be extremely time consuming even using one of the many search engines. If the user does not know how to employ strategies for refining and expanding a search they can spend hours wading through useless information. (Selwyn, Marriott et al. 2000).

...the internet has spawned new information industries and professions, and given researchers, educators, and network users the world over the abiding challenge of finding in this information haystack the needle of useful, quality information which is pertinent
In his study of people’s perceptions of the Internet (Bruce 1999) found that many people thought of the Internet as analogous to an enormous and badly organised library or an organic entity that is constantly growing and changing. The size and complexity of the Internet has led to the development of a growing number of directories, portals and gateways that are subject specific. These can be helpful but only if you know they exist and are able to find them. It is easy to get lost on the Web, to follow a series of interesting links and wander completely off the subject.

However, the Internet does have advantages as an information source

- Information is available immediately and therefore it is usually possible to find the most current information on a topic (Selwyn, Marriott et al. 2000)
- It is accessible from anywhere (with an Internet enabled computer)
- It enables the learner to access a variety of different sources of information across the globe. (Tait 1997; Selwyn, Marriott et al. 2000)
- Much of the information is free (apart from telecommunication and Internet Service Provider charges).
- It creates the possibility for interaction and dialogue with authors of information (Forsyth 1998)

The disadvantages of the Internet as a source of information include:

- The size of the Internet makes it difficult to navigate
- Information on the Internet may not always be from a reliable source
- Download times can be frustrating, especially for media rich pages (Forsyth 1998)
- Pages can be moved or be inaccessible for technical reasons (Mc Laren 1997; Forsyth 1998)
- In order to use the Internet effectively users need a basic understanding of how it works
- It requires the appropriate hardware and software in order to access it
What is the role of the Internet in Higher Education?

Higher education and the academic community were among the first adopters of the Internet and are still one of the major users of the resource (Mc Laren 1997). Universities have helped to contribute to the growth of the Internet (Perry, Perry et al. 1998) and continue to be some of the main users. Students use the Internet for research and to search online catalogues and services. Faculty use web pages and virtual learning environments (VLEs) for posting course information and syllabi (Vermer and Parikh 2001) as well as for their own research and communication with communities of practice through email list servers and bulletin boards. There are now many online-research, indexing, abstracting and full text services such as http://www.jstor.ac.uk that enable researchers to download papers and abstracts. The Internet can be used for synchronous and asynchronous communication including virtual chat, discussion groups, listserv groups and video conferencing. Students can submit assignments via the WWW and lecturers can run online tutorials. (Mc Laren 1997). The Internet is an excellent resource for supporting student centred learning and it offers opportunities for students to "contribute to each other's learning" (Jeffries and Hussain 1998)

Many universities also use their web sites as a means of promoting their services, listing their courses and recruiting students. Some even offer online enrolment and there are now a number of universities running full undergraduate and graduate degree courses using the Internet (Perry, Perry et al. 1998). There have also been moves recently to develop virtual universities. Jones International University, a virtual organisation recently received accreditation from the North Central Association of Colleges and Schools in the USA (Perley and Tanguay 1999) and the British Government is seeking to develop an e-university (HEFCE, 2001).

Some commentators are highly enthusiastic about the potential of the Internet in education:

Internet technology as an educator's resource outperforms even the sun. The sun can only shine on half of the globe at a time, while Internet-delivered education can cover the entire globe, and around the clock, with knowledge. (Kostopolous 1998, p 258)

Clearly the Internet offers a wide range of opportunities for communication,
delivery of the curriculum and support for on campus students engaged in courses being delivered by traditional methods and for distance learning.

There have also been changes in higher education and the work place in recent years that have created a need for the Internet to be integrated into the student experience. There is a general agreement in the literature that the current model of higher education that was developed for training an elite does not effectively transfer to mass higher education. (Darby 1992; Daniel 1996; Dearing 1997). Higher education is being forced to look at alternatives to the traditional lecture-driven campus-based model in order to meet the needs of mass higher education. Many believe that IT, computer based training (CBT) and Internet based training (IBT) can provide part of the solution to this dilemma by enabling students to work off site and participate in distance education (Ordish 1996; Dearing 1997).

An increase in student numbers has also led to an increased pressure upon more traditional resources, libraries, books and tutors (Ordish 1996). Unlike print based and other media the Internet has the potential to supply information to multiple users if appropriately designed. The Internet requires that students become active participants in their learning and encourages them to explore a wide range of resources and viewpoints (Tait 1997; Jeffries and Hussain 1998). The Internet also provides opportunities for the development of new academic communities (Brown and Duiguid 1996) and its flexibility allows for new ways of learning and teaching to be developed that move the focus from the teacher to the learner (van Weert 1995; Owston 1997; Jeffries and Hussain 1998). Owston (1997) recognises the potential of IT for widening access to and participation in higher education. Ordish (1996) identifies the possibilities for developing a new global academic community and global competition for students.

Kostopolous (1998) predicts that in the not too distant future potential students will have an expectation that academic institutions will offer a range of courses via the Internet. If this is true there will be increased pressure for institutions to compete on a global basis, as students will not be restricted by location. The Internet offers flexibility in the delivery of learning materials in terms of when, and where students study, (Fayter 1998). It can also encourage communication, collaboration and interaction between students and creates the possibility for dynamic delivery of courses in a non linear environment.
The Internet can provide students with the ability to access and use authentic materials. By providing them with a wide range of information sources, which they must evaluate, the Internet can also encourage students to take responsibility for their own learning (Fayter 1998). Educational institutions can no longer view IT as an option but need to consider a strategy for true integration of the medium within the learning environment. The Internet offers the opportunity to ease many of the problems faced by educators in higher education. It offers flexibility, learners can learn at their own pace and it could relieve accommodation problems; students do not have to be on campus or in a classroom to access it (Tiffin and Rasingham 1995). The Internet also offers alternative forms of information, which may relieve overburdened libraries (Tiffin and Rasingham, 1995; Fayter 1998). The Internet is a particularly useful resource in fields where information “loses value when not current” (Vogel and Klassen 2001, p 112), which is of particular relevance to the fashion industry where the currency of information is vital and the speed of change dramatic and perpetual.

Many universities and lecturers are now putting notes and resources on the Internet and are using Virtual Learning Environments such as Blackboard and Web CT as a means of providing administrative support and learning resources (Jeffries and Hussain 1998; Selwyn, Marriott et al. 2000; Vermer and Parikh 2001). People are becoming used to using technology in the workplace and pressure from parents, employers and government means that IT is becoming an essential part of the curriculum (van Weert 1995; Harper 1996). Some universities now offer complete degrees on the Internet and the UK government has developed a series of initiatives and strategies to promote the use of C&IT in teaching and learning. These initiatives include the Computers in Teaching Initiative (CTI), The Teaching and Learning Technology Programme (TLTP), The University for Industry, Learndirect, the Teaching and Learning Technology Support Network (TLTSN) and the creation of New Technology Institutes (NTIs) (HEFCE 2001).

Despite all this encouragement from the Government there are, however, still many barriers to the integration of C&IT and many of the deliverers and users of higher education have not fully engaged with advanced technology. Widespread use of IT in university teaching in many countries is still not the norm (Brown and Duiguid 1996; Johnston and Mc Cormack 1996). Johnston and Mc Cormack (1996) say that “the real changes being experienced by
students and teachers within our universities are far less than expected" (p 36). There are still it seems many educators who have reservations about the role of the Internet in higher education (Sosabowski, Herson et al. 1997) or who have not yet developed the appropriate skills to be able to integrate IT within their teaching (Johnston and McCormack 1996).

There is an expectation that students will undertake more self-directed study and be capable of using the Internet as a resource. Many institutions have focused upon providing students with access to the Internet without considering how and why they are going to use it and even whether or not they are using it. As (Selwyn, Marriott et al. 2000) point out, access does not necessarily equal use and students are often given inadequate guidance on how to use this resource. Students can be strategic in how they use their valuable study time and will often be reluctant to invest time in the acquisition of new skills if they cannot see an immediate benefit and are being driven by assessment (Selwyn, Marriott et al. 2000). Selwyn et al. (2000) go on to argue that, "assuming the inevitability of eventual Internet use throughout higher education curricula may not be good enough" (p 183).

The literature recognises that there is a need for a careful exploration of the teaching and learning methods being employed using the Internet (Doepner, Scott et al. 2000). The move towards the development of strategic policies for the integration of C&IT has been slower than expected. A 1999 HEFCE report identified that "only a small number of institutions have identified the enhancement of the use of C&IT as a major part of their teaching and learning strategy" (HEFCE 1999/60, para.10).

Because the Internet is a relatively new medium, there is still a need for a considered investigation of the claims made for and against it. The questions about how and when to utilise it and the pedagogy that should underpin it are still being explored in a literature that is developing around this subject area. Most C&IT initiatives rely upon the learner accessing and making use of the facilities on offer, yet the literature shows that even the most sophisticated computer users can be reluctant to engage in E-learning or fully utilise the potential of the WWW (Jeffries and Hussain 1998; Vermer and Parikh 2001).

Summary
This chapter has identified that there is a role for the Internet in higher
education but that this role is not yet being fully exploited. Although there are calls for a more student-centred approach to learning, the reality is that much of the teaching in higher education still relies upon traditional methods and lectures (French 1999). Educators need to be careful that they do not place the responsibility for learning with the learner without providing them with the appropriate support to be able function independently. How this might be achieved is discussed in the next chapter which outlines some of the pedagogical issues involved in the use of computers and the Internet in teaching and learning.
Chapter 3 An overview of the issues relating to teaching and learning using IT

Introduction
This chapter will examine the issues relating to the use of communication and information technology (C&IT), computer and Internet based teaching and learning (IBL) in the context of the study. The role of IBL in fashion education will be examined and the relationship between existing research and the aims of the study will be explored.

Internet based learning can take many forms. It can be structured in the form of online tutoring packages and distance learning courses. It can involve synchronous or asynchronous communication. It can be part of a larger traditional programme or it can be freestanding in some cases leading to a qualification. In a less structured format it can be used as a vehicle for independent and resource-based learning or as a research tool. It is the latter form of independent learning using the Internet as a research tool that is the concern of this study.

There are many approaches to the use of information technology in teaching and learning, The two that seem to feature most prominently in the literature are instructional design and constructivism. These two approaches will be explained and their relative strengths and weaknesses analysed.

The Instructional Model
The instructional model draws upon the work of Skinner (1968) and Gagné (1992). This model is highly structured and based upon the identification of observable behaviours and appropriate skills that the learner must achieve. Drill and practice are used to enable the learner to master a skill before moving on to a more complex level (Boyle 1997). Gagné (1992) identifies the different skills and conditions required for learning to take place. He advocates the mapping of learning objectives against this taxonomy to ensure that the right strategies are being employed to facilitate learning and for the learner to achieve these objectives. The taxonomy is based upon a hierarchical arrangement of intellectual skills from discriminations at the bottom through to problem solving at the top (see fig 2.1).

The taxonomy is useful in identifying the objectives of learning and ensuring that appropriate tasks are being set for the development of different types
of skills. This method was very popular and used extensively in early CBL programmes. More recently many educationalists have rejected this approach in favour of constructivist methods. The criticisms of the instructional approach are that it can be too prescriptive, mechanical in nature (Boyle 1997) and difficult to apply to a learner centred model. The limitations of the instructional technology approach have also been noted by Laurillard (1993) who states that;

*A further problem with instructional design of this type is that the analysis into components of the teaching-learning process is not followed by any synthesis. Any relationship between cognitive strategies and motor skills, for example, is not considered. Gagne' himself has recognised this recently in a paper with another of the key figures of instructional design, David Merrill.* (Laurillard 1993, p 74)

![Diagram: Gagne's Levels of Complexity of Intellectual Skills]

*Fig.2.1: Gagné’s Levels of Complexity of Intellectual Skills: Gagné (1992) p 55*
Stenhouse (1975) also has objections toward the programmed approach from which the instructional model developed. He points out three areas of weakness.

One is that it demands little critical speculation of the learner and thus offers him only the learning built into the design: that is, it does not seek to 'develop the mind'. Related to this is the second weakness. It provides restricted opportunity for the transfer of learning: transfer possibilities must be pre defined and built in by the programmer. Finally, though it deals in the tactics of motivation, it does little about the strategy. Why should I want to learn what is in the programme? It is necessary to posit a process of education (or self-education) outside the programme. (Stenhouse 1975, p 35)

He goes on to point out that whilst having clearly defined objectives is admirable, the classroom is not a controlled environment and unpredictable and opportunistic learning can also take place. Garrison (1993) argues that the instructional approach of Gagné has its roots in the “behaviourist orientation” and that this is evident in many learning materials, which are “pre-packaged with prescribed objectives” (p 12). This approach does not relate to the main objective of most university teaching, which is based around encouraging students to develop strong analytical and critical thinking skills. These are generally described as higher-level cognitive skills. These skills engage the student in constructing meaning and validating their knowledge through “discourse and action”. (Garrison 1993, p 12). These skills he argues are not developed by prescriptive instruction. Sparkes (1993) posits that the hierarchical nature of taxonomies is problematic because “the hierarchical arrangement of their elements cannot be sustained e.g. it is possible to ‘synthesize’ before ‘analysis’, and to ‘evaluate’ without ‘synthesis’” (Sparkes 1993,p136).

Bates (1995) accepts that pre-programmed computer based learning has a role but argues that there are many other learning activities for which such a behaviourist, pre-determined approach is not suitable. Phillips (1997) recognises that when designing computer based learning activities or environments, instructional design can be useful in analysing the content of a learning activity. He advocates an approach that uses the strengths of
instructional design balanced with elements of the constructivist approach. He warns against applying instructional design too narrowly as this may result in a transmission based model of instruction. However, a totally constructivist approach may make false assumptions about the level of research skills that students possess.

_The student may not have the requisite research skills to be able to construct knowledge from the knowledge network...it is necessary to give the students guidance in their discovery of knowledge, otherwise they may simply not investigate or make sense of the hyperlinks._ (Phillips 1997, p71)

Boyle (1997) warns against total rejection of the instructional approach saying that:

_ISD may be over-prescriptive. Are some modern approaches, by contrast too vague and woolly? If we are going to reject the formal precision of the ISD approach then we need to justify this in a rational and cogent fashion._ (Boyle 1997, p 70).

He goes on to argue that whilst the instructional approach places a strong emphasis on objective assessment, this is in contrast to the constructivist approach where the issues regarding assessment are less clearly defined.

In design education, reducing learning into neat packages of skills has limitations. Learning activities in design are often unstructured and focus upon an experimental approach. The design curriculum is not necessarily hierarchical but involves extensive synthesis of a wide range of ideas and constructs. It could therefore be extremely difficult to apply the instructional model to many of the learning activities that are desirable in the art and design curriculum.

**Constructivism**

Constructivist theories of teaching and curriculum design have drawn extensively upon the work of Piaget. Piaget developed a theory that he called “genetic epistemology”. In this theory, based upon naturalistic research into child development, he identifies four cognitive structures; sensorimotor, preoperations, concrete operations, and formal operations. In order to change the cognitive structure the child must engage in a process
of adaption, assimilation and accommodation. By constantly adapting to the environment and assimilating new information the learner creates new cognitive structures. Piaget identified age ranges at which the different stages of cognitive development generally applied, by matching the learning activity to the developmental stage of the child, cognitive development is facilitated. Although Piaget's theory relates to child development, it has been argued that it can be applied to adult learners (Sutherland 1999).

**Bruner and Situated Cognition**

One of the leading advocates of the constructivist model is Bruner (1990). Bruner's constructivist theory builds upon the study of cognition and considers learning to be "an active and constructive process" (De Corte 1990, p 73). Bruner argues that the learning process is situated within a context; our past, our culture and our language define this context. In order to progress, the learner needs to build upon their existing perceptions and knowledge to construct understanding. Learners actively engage in the process of knowledge acquisition and construction by integrating new knowledge with prior knowledge in order to make it meaningful and to continuously build upon what they have learnt (TIP 2001).

**Anchored Instruction**

The Cognition and Technology Group at Vanderbilt (CTGV 1990; CTGV 1993) further developed situated learning theory and applied it to the use of technology-based learning. They proposed that providing 'anchors' for instruction in the form of videodiscs that provided complex problem solving environments that were "capable of being explored from multiple perspectives (CTGV, 1990, p 8 ). These environments enabled learners to engage in authentic activities where they could construct their own knowledge and develop higher order cognitive skills within a collaborative process. The CTGV group also suggest that the learner should be provided with "resources and scaffolds" (CTGV, 1993, p 55) to help them move forward. The Internet is a complex environment where it may be possible for learners to engage in similar exploration and collaboration. The notion of instructional anchors and scaffolding could be transferred and applied to an online learning environment. Davidson (1995) states that:

*Again, there is an obvious and direct relationship with the Internet and the ability of the learner to navigate/control the direction and*
scope of the task. Learners are also allowed to work from their own existing knowledge and individual areas of expertise. There is, however, a requirement for an anchor to give learners a focal point. The value of organization and clarity of purpose in site design thus become apparent, and indicates a need for navigational assistance of guidance for learners to optimize their learning experience. (Davidson 1995, online)

In an environment where the skills that learners require are constantly changing, the ability to transfer knowledge and skills and to engage in lifelong learning are going to be critical factors (Bates 1995; Candy 1998). The problem with situated cognition is that it does not deal with issues of transfer. If learning only takes place within a given context how can learners transfer these concepts and apply them to new and different situations? De Corte (1990) argues that:

Explicit teaching for transfer can then be seen as the next step, and requires that pupils are intentionally shown, but also discover by experience, that the abstracted skill can be successfully applied in other domains than the area in which it was originally acquired. (De Corte 1990 p. 79)

The Web is a complex environment where the application and transfer of cognitive strategies will be an important factor in enabling the learner to derive meaningful learning from the plethora of information that it provides. A theory that attempts to enable this transfer across contexts is cognitive flexibility theory.

Cognitive Flexibility Theory

This theory focuses upon learning in complex situations and environments. Spiro (1980) argues that it is possible to incorporate new information into existing structures without substantially altering those structures, and that:

Arguably, a more interesting kind of learning in the educational process involves the radical restructuring of existing knowledge as a result of encountering new information. What might be called conceptual change or, after Piaget, accommodation (Spiro 1980, p 271).
In this approach the learner is presented with diverse examples and cases which provide a context for the learner to develop and construct their own representations of knowledge. The theory is particularly useful in supporting learners in the use of interactive materials and hypertext based environments. Spiro (1980) applied the theory to reading comprehension stating that “constructed meaning is the interactive product of text and context of various kinds, including linguistic, prior knowledge, situational, attitudinal, and task contexts among others” (p. 246).

Constructivism, is a generic term for a variety of theories including cognitive flexibility theory and situated cognition. Each of these approaches rejects the didactic transmission based model of teaching. Constructivism favours an approach where the learner is actively involved in transforming and organising knowledge into constructs that enable them to bring meaning to their experiences (Davidson, 1995). The emphasis is on learners who “actively construct their knowledge and skills through interaction with the environment, and through reorganization of their own mental structures.” (De Corte 1990, p 73). The aim is to encourage learners to discover concepts and principles for themselves and to actively engage in their own learning. Tait (1997) describes constructivist theory as covering a “wide range of views that are not entirely consistent with a single model of the learning process.” (p 3). He goes on to identify some common principles of constructivist theory that include: reflection that builds upon existing knowledge, active construction of a “personal conceptual knowledge base”, authentic and situated activity, and “multiple views of a subject area”. (Tait 1997 p 4)

**Authentic Learning**

The use of authentic tasks and environments for learning is one of the key principles of constructivist theory. Lave and Wenger (1990) propose a model of learning based upon “legitimate peripheral participation”. In this model the learner starts as a novice and through interaction with experts in their domain moves gradually toward the acquisition of expertise through a process of cognitive apprenticeship within an authentic situation. In cognitive apprenticeship “learning is focused upon performance and involves the ability to do something rather than talk about it.” (Joliffe, Ritter et al. 2001, p 23).

Situated learning theory has been further developed by Brown, Collins and Duguid (1989) who advocate the use of cognitive apprenticeship through the
acquisition and use of cognitive tools within a specific domain. They argue that
cognitive tools need to be actively used and progressively developed, enabling
the learner to achieve a richer understanding of the tools and the world in
which they are used. They also say that learning is framed by the culture of
the domain and it is this authenticity which is often lacking in a classroom
environment. Crook (1994) takes up this argument and claims that:

...knowledge should not be conceptualised as a catalogue of stored
mental representations; instead, knowledge is always created within
the circumstances of interacting with the world - in other words, it is
situated within these interactions. (Crook 1994, p 44)

Crook also accepts that learners may be more engaged by activities, which they
can relate to their own experience. Davidson (1995) argues that the Internet
has a great number of resources developed by experts within specialized
fields, which can provide the learner with an “authentic” virtual learning
environment. The Internet is generally accepted to be a rich and diverse
learning environment that is both flexible and unstructured. This presents a
challenge when using it as a learning resource. The challenges are to provide
the learner with the opportunity to work on authentic tasks that relate to their
particular context and to enable self-directed learning whilst providing the
appropriate level of support in what may be an unfamiliar environment (Fischer
and Scharff 1998). Applying the learning to a context that the students can
understand is important in creating a positive motivation for them to engage
with the technology. It is also important for them to be able to build upon
existing knowledge and to be presented with challenges that they are capable
of achieving (Bruner, 1966). However, engagement in an authentic task in
itself may be insufficient to ensure that the appropriate cognitive structures are
in place. The learner, it is argued, also needs to be reflective, to be aware of
what they have learned and to identify the knowledge and skills that they still
need to acquire.

Reflective Practice
Laurillard (1993) argues that simply engaging with real world problems
situated within an authentic context does not enable the student to fully
utilise their knowledge. She argues that for everyday knowledge to become
academic knowledge, it needs to be situated and reflected upon. This enables
the learner to develop concepts through analytical procedures, which allow
them to go beyond their immediate experience and even to change the way in which they experience the world. The importance of reflective practice in the development of ‘professional’ skills was advocated by Schon (1987). Hammond and Collins (1991) point to the advantages of engaging learners in a reflective process. Reflection can help them to take control of their learning, to integrate theory and practice, gain new insights into their own learning style, improve their ability to communicate with others and express their ideas. However, getting the learner to be reflective may not be easy, and they may need some guidance to help them move from purely descriptive to analytical thinking.

*Learners unaccustomed to reflecting on their experiences, feelings and learning will need an explanation of why it is being recommended and some practice before they will feel confident about themselves as reflectors.* (Hammond and Collins 1991, p 168)

**Social Development Theory**

Vygotskyian theory otherwise known as social development theory (Vygotsky 1962; 1978) is also focused upon cognitive development and is considered to be complementary to the work of Piaget. Boyle (1977) criticises Piaget's work because "he fails to take adequate account of the special nature of social interaction and the influence of cultural transmission mediated through these social interactions" (p 81). Vygotsky proposes that there is a 'zone of proximal development'. This is the area between what the learner is able to do alone and what they are able to do with assistance. In this theory the role of the tutor is to provide the support for the learner to develop and progress. Language and socialisation play a key role in the learning process. The work of Vygotsky is also a vital component of situated learning theory (Lave and Wenger 1991) discussed earlier in this chapter. The implications for Web based learning are that tutors need to devise a range of appropriate activities that enable the student to move, with assistance, from one stage to the next and to use social interactions to enable this. This assistance may be in the form of a live tutor or contextual help tools.

**Experiential Learning**

The work of Rogers (1994), like several of the other theories discussed, stresses the need for the learner to be actively involved in learning. The learning also needs to be applied to realistic problems and situations. The
theory stresses the importance of learning to learn and openness on the part of the learner. The learner is motivated by an interest in the subject matter and the provision of a 'safe' environment in which to explore new concepts.

The construction of knowledge in a social context is one of the key tenets of constructivist and cognitive theory, emphasising the need for co-operation and collaboration amongst learners and the development of a learner centred model where the tutor acts as facilitator. These aspects of constructivist theory have been widely drawn upon by exponents of computer mediated communication and computer based and online learning as discussed below.

Collaborative learning and Online Environments

A wide range of advantages associated with collaborative learning have been identified including:

- The development of 'critical thinking through discussion, clarification of ideas, and evaluation of others'. (Gokhale 1995)
- The development of team working skills (Sclater 2001)
- Enabling learners to participate in discussion and dialogue, to examine different perspectives of a problem and to engage in real world tasks (Tinzmann, Jones et al. 1990).

There are disadvantages associated with collaborative learning. To be successful, collaborative learning activities depend upon a wide range of variables including the group members, external conditions, the task being undertaken and the expertise of the tutor or facilitator in "creating and managing meaningful learning experiences" (Gokhale 1995, online).

Computers and the Internet are recognised as excellent vehicles for the support of collaborative learning. They support the bringing together of dispersed learners (Sclater 2001) and enable synchronous and asynchronous communication through Email, discussion boards, video conferencing and virtual learning environments (VLEs). Within industry, there is now an increasing requirement for teamwork, prompting educators to include more of these skills within the curriculum. Collaborative learning in an online environment can help to develop these skills by enabling learners to work together to reach the solution to a problem, which is based upon a shared
understanding (Sclater, 2001).

In a collaborative environment the role of the tutor changes from that of information giver to mediator, providing support and direction and helping the process of learning to learn. (Tinzmann, Jones et al. 1990). This emphasis on mediated learning is evident in much of the literature on constructivist learning and is also reflected in texts on the role of the tutor in CBL and IBL. (Strommen 1992; Youngblood, Trede et al. 2001).

Collaboration, social construction, conversation and dialogue are themes that appear throughout learning theory. Pask (1975) developed a theory that uses conversation as a vehicle for learning. By engaging in conversations on different levels and feeding back what they have learnt, the learner makes explicit the relationships between concepts. He identified two types of learner: serialists who use a sequential linear structure and holists who seek high order links and relationships or metacognitive processes. Vygotskian theory is particularly relevant in supporting the case for collaborative learning. The theory advocates that:

*By interacting with and engaging in dialogue with others learners are able to solve tasks they would not be able to solve on their own. However these tasks must fall within the ‘zone of proximal development’ if the learner is to fully assimilate the concept.* (Dillenbourg and Schneider 1995, online).

The role of collaboration and social interaction is emphasised in the dialectical approach to constructivism. In this model the structure and support for the learner is provided by peers, teachers or in some cases software tools. The technologies that have been developed to support this kind of learning are generally described as Computer Supported Collaborative Learning (CSCL) (Dalgrano 2001). These tools can be used for synchronous or asynchronous communication between individuals or to support group work.

Some educators fear that children using a computer excessively do not develop the ability to interpret verbal and non verbal cues and that this can hinder their social development (Smith and Curtin 1998). Alternatively it is argued that the interactive nature of the Internet “allows for new linguistic discourses that reflect social and emotional issues” (Smith and Curtin 1998, p
215). Email, chat rooms and Web-based communities are offering new ways of collaborating and communicating that challenge children to communicate with others from different cultures (Smith and Curtin 1998).

The discussions about appropriate ways of utilising the Internet in teaching and learning continue, as they continue in all aspects of education. There is no universally accepted pedagogy or theory in any aspect of education so we should therefore not be surprised that this is the situation with new technology. It is important to recognise that even though constructivist theories are widely accepted as being valuable and relevant to the new media, they are not without their criticisms and are probably not being extensively applied.

Advantages and Disadvantages of Constructivist Theory

Advantages

The constructivist approach “now appears to dominate the view of learning articulated in the educational literature” (Fox and Herrman 1998). It is important to understand that the term encompasses a “range of epistemological variations” (Boyle 1997, p. 71). The theory offers a variety of approaches that can be adapted to meet the needs of individuals. Constructivist theories appear to have many advantages; they place an emphasis upon the active engagement of the learner within an authentic environment; they encourage and motivate the learner by enabling them to engage in collaboration and provide opportunities for the learner to develop their own cognitive strategies. Constructivist methods and environments reflect the demands of the changing world of work where problem solving and teamwork skills have an increasing value.

Disadvantages

The disadvantages of the constructivist approach are that in order to gain full advantage from these methods the learner needs to have sufficient existing knowledge which they can build upon. They may also need some anchors or other supporting mechanisms to help them to negotiate complex and unstructured environments. The learner needs to be motivated and actively involved in order to benefit from this type of learning and they may be resistant to methods that require them to take a more active role in their own learning (Daniel 1996).
Constructivist learning environments also present problems for the teacher. Truly constructivist teaching requires a great deal of preparation and engagement on the part of the teacher as well as the learner. The constructivist teacher also has to take account of existing knowledge and values of the individual learner (Fox and Herrman 1998). It could be argued that it is cheaper and easier to continue to use the didactic lecture based approach. In practice this approach still prevails in a lot of university teaching perhaps because as Laurillard (1993) points out although the lecture “is a grossly inefficient way of engaging with academic knowledge. For the Institution it is very convenient, and so it survives.” (p 109).

Constructivist approaches also present difficulties when it comes to assessment. Boyle (1997) questions “what the outcomes of the learning process should be” (p 76) if the process of constructing knowledge is more important than the knowledge and skills acquired? The emphasis on group work also raises questions of how to assess individual learning within a collaborative activity. Boyle (1997) also argues that although constructivism offers a 'liberating' view that fits with the "opportunities offered by hypermedia technology " it also needs to be viewed in a balanced way if "its full impact on multimedia design is to be achieved." (p 83). The designers of IBL activities will therefore need to think carefully about the ways in which they utilise the theory. Fox and Herrman (1998) argue that in order to achieve the stated aims of constructivism the learner still needs to have mastered the automation of the required lower level skills to enable them to think strategically and employ higher level skills. They recognise that there is still a need for some of the drill and practice normally associated with behaviourist theories as well as the challenging problem solving approach advocated by constructivist theories. Terwell (1999) also argues for an approach “which unites elements from multiple theories, along with heuristics drawn from experience, into a coherent basis for action.” (p 196).

**Constructivist approaches to CBL and IBL**

As previously stated there are many variations on constructivist theory, which is in itself a broad based framework for explaining cognitive development. Within this framework the different theories have links and overlaps, as well as shared themes. The main themes are:
• The use of dialogue, social interaction and conversation as a means of developing and integrating new knowledge

• Ownership of the learning by the learner, the development of realistic, authentic domains in which the learning can take place

• The provision of scaffolding for the learning by adapting the learning to the learner's particular stage of cognitive development, existing knowledge and style of learning

• The provision of anchors or guidance to help the learner explore new domains and environments

• The need for the learner to reflect upon their learning and the success of their strategies.

All of these themes have been used and applied to the use of computers and technology in an attempt to develop a pedagogy that accommodates the new learning opportunities offered by CBL and IBL. There are many advocates for a constructivist-based pedagogy to be used with new technologies (Strommen 1992; Tait 1997; Bostock 1998; Crawford 1999) but the reality is that in practice some CBL and IBL programmes and packages are still designed using instructional methods. Many of these programmes still place a strong emphasis on the transmission of knowledge more often than not in the form of text and can be little more than "printed materials, converted directly to electronic form" (Dalgamo 2001, p. 192).

Papert and LOGO

There are of course some exceptions and notable attempts at developing CBL and IBL using constructivist methods. One of the early pioneers was Papert (1980). Papert had worked with Piaget and used his theoretical ideas "as a basis for the design of learning environments which would facilitate the process of cognitive development" (Boyle 1997, p.11). He developed the computer language LOGO a "child centred learning environment based upon a constructivist psychology" (Boyle 1997, p 12) to help children grasp abstract mathematical concepts. It produced a lot of valuable insights into the possibilities, which Boyle argues are still valid for the design of modern interactive multimedia learning environments (IMLEs). Constructivists have used simulations and microworlds such as LOGO to produce realistic contexts that allow learners to engage in exploration and experimentation. For the past
30 years they have been used as part of computer assisted learning (Dalgrano 2001). Recent technology has enabled more sophisticated forms of these simulations, including virtual reality and 3D modelling. It is even possible to take virtual tours of museums and art galleries on the Web.

The Web uses hypertext and hypermedia to enable the user to browse through its content. It is argued by Dalgrano (2001) that this "freedom to browse through the content is consistent with the constructivist principle that learners should be given the opportunity to discover knowledge through their own active exploration." (p 32). Dalgrano (2001) also suggests that hypertext can act as a mechanism for the application of cognitive flexibility theory because it enables the learner "to choose from a range of relevant examples of the theme or concept being illustrated." (p 32). Cognitive tools that assist with knowledge construction can enhance this unstructured form of learning. These tools can take the form of "context sensitive pedagogical guidance", "concept mapping tools" or "quizzes and problem solving exercises". This approach is consistent with the "exogenous view of constructivism that recognises the value of direct instruction, but not the teacher centred single sequence of instruction of behaviourists" (Dalgrano 2001, p.188). By providing the learner with support as they browse it is less likely that they will become lost in hyperspace.

Constructivist ideas have strongly influenced research into software tools. However, whilst being valuable in enabling us to construct the kind of problems that need to be solved, the theory does not provide much guidance about what is to be learnt (Boyle 1997). It is therefore important when designing constructivist-learning environments to provide the learner with scaffolding, in the form of tools or anchors, that can help them to achieve the goals of the activity.

The Internet and pedagogy
As discussed in Chapter 1 there has been a general shift in educational thinking toward a student-centered approach based upon constructivist methods of teaching and learning. This shift is increasingly reflected in the literature on learning technology, however, whether the use of learning technologies will lead to a shift from instructional to constructivist paradigms is not clear (Hughes and Hay 2001). The issues involved in the application of this approach to computer and Internet based learning is beginning to be addressed in a developing
literature investigating the relationship between the Internet and teaching and learning theory. However, many Web-based resources are still not addressing these pedagogical issues, and many are still little more than electronic texts (Dalgrano 2001). There is some doubt as to whether the impact of new technologies upon learning can be measured (Harriman and Fitz Gibbon 1998) and it is questionable as to whether this is what researchers should be trying to do. It seems more important that educators develop resources and learning activities that are built upon sound pedagogical principles in order to facilitate learning. This principle should apply equally to activities that utilise new technologies and traditional techniques.

The literature seems to be broadly in agreement that trying to retrofit existing materials into a Computer-based course, or merely adding a bit of technology onto existing programmes does not work (Comu 1995). In order to use the Internet effectively, learners will be required to make evaluations about the authenticity and accuracy of the information they find. As Fetherston (2001) points out, the quality of the material on the Internet is not subject to the same quality controls as the traditional materials that learners may access through their university library. Burbles (1998) highlights the difficulties presented of information seeking on the WWW where (unlike traditional written materials) there is no clear hierarchical structure in the way that information is presented. The effect of the web, he says, is to create a “juxtaposition of apparently unrelated points of information and the reduction of all to the same superficial level of significance.” (p 114). This is caused by the nature of the WWW, which is constructed from a series of pages that can be linked together using hypertext. The limitations of hypertext are highlighted by Laurillard who is sceptical about “the claims made for its potential in education” (1993, p 122). She warns that, “by its very nature, it undermines the structure of the ‘texts’ it uses and reduces knowledge to fragments of information.” (Laurillard, 1993, p 122). The opposite view is put forward by Warschauer (1999) who points to research by Landlow and Bolter (1992) showing that

...the associative nature of hypertext helped create for their students a very different sense of the meaning of author, reader, narrative, and text. Without a single linearity imposed on the text, readers are forced to take a much more active role in aspects traditionally viewed as authoring, such as deciding in what order a story should
Laurrilard (1993) goes on to recognise that multimedia can have some advantages, allowing exploration and access to supporting data but says that it does little more than this and should be not be used in a stand alone environment. This view is reinforced by Rosenberg (2001) who states that;

...simply adding multimedia to a bad learning program won't improve it. Worse, when we confuse multimedia design and development with instructional design and development, we may be in for programs that look great but don't teach. (Rosenberg 2001 p.56)

Other commentators, whilst recognising that the learner can get lost in 'hyperspace', point out the benefits of the interconnectivity offered by the Internet. They propose a guided structure and training in searching techniques to help overcome this problem (Stanchev and Ivanov 1998).

The importance of integrating IT within the curriculum is a core theme in much of the literature, (Laurrilard 1993; Crook 1994; Cornu 1995; van Weert 1995; Stanchev and Ivanov 1998). Integration needs to be physical in terms of the equipment, pedagogy and within staff development programmes. The need for IT work to be assessed is also part of this integrative process. If the work is not seen as being worthy of assessment the more strategic learners may opt out of using it (Tait, 1997). The students should also be engaged in realistic and authentic activities, which relate to their subject domain and professional practice in that area (Laurrilard 1993; Tait 1997). Garrison (1993) notes the dangers of trying to use old techniques with new technologies and the need for two-way communication to be built into computer aided learning (CAL) if we are to escape from the “dominant paradigm of prescribed and prepackaged course materials". (Garrison, 1993, p 12).

The importance of communication or dialogue in the educational process is stressed in much of the literature on constructivist methods. This emphasis is usually upon teacher to learner or learner to learner as exemplified by literature on computer-mediated communication (CMC) (see Crook, 1994). Muire et al
(1999) found that the implementation of constructivist web-based learning enabled their students to "...understand the critical importance of collaboration related to understanding difficult scientific issues, learning about potential careers, and participating in a discourse community of learners." (p 68)

The potential of the Internet for developing new and diverse communities has also been recognised by Jones (1995),

**Critical to the Rhetoric surrounding the information highway is the promise of a renewed sense of community and, in many instances, new types and formations of community. Computer-mediated communication, it seems, will do by way of electronic pathways what cement roads were unable to do, namely, connect us rather than atomize us, put us at the controls of a "vehicle" and yet not detach us from the rest of the world. (Jones 1995, p 11)**

A major topic of discussion has been whether computers can replicate or replace the role of the tutor and be able to meet the needs of a diverse range of learners with different learning styles and preferences. Durling (1995) identifies that even human tutors are not always able to do this.

The literature seems on the whole to agree that the role of computers in a constructivist approach to learning should not be to replace tutors but to support a student centred approach to learning. This change in emphasis will introduce a new element to the teacher's role. They will be the facilitators or catalysts for learning rather than the deliverers of knowledge. (Devine 1997; Erichsen 1998; Ljosa 1998).

The themes that appear to be developing within the literature draw upon a variety of theories of learning and teaching. Together these themes may form the basis of a new pedagogy that draws upon the relevant aspects of each theory. Each of the theories explored in this chapter seems to have aspects that are relevant to traditional face-to-face teaching methods and also to Internet Based Research (IBR). Drawing upon these theories it seems that learning activities using the Internet as a research tool should:

- be authentic and situated within a context to which the learner can relate;
• enable the learner to move beyond that context and apply their learning to a variety of cases and situations;
• provide the learner with a supporting structure or scaffolding;
• enable the learner to build upon their existing knowledge;
• allow the learner to integrate new knowledge into their existing cognitive structures and in so doing to alter those structures to accommodate the new knowledge;
• actively engage the learner and encourage them to reflect upon the success or otherwise of their cognitive and problem solving strategies;
• support social interaction and collaboration.

To integrate all of these elements in an individual learning activity may not always be possible but there is certainly the potential to build them into a programme of study or a series of activities.

Art and Design, The Fashion Curriculum And The Role of IT

The role of IT within the art and design curriculum is starting to be addressed within the literature. This investigation has been influenced by the work of the CTIAD (Computer in Teaching Initiative, Art and Design) and more recently the development of the Learning and Teaching Support Network, Art, Design and Communication subject centre. Fashion is not very visible in this growing body of literature. Aldrich, (1990) and Taylor, (1990) cover the use of computers in fashion and make reference to the Internet, but despite exhaustive searches, it has not been possible to find any real body of literature relating to the use of the Internet in fashion education or indeed on fashion education per se. There is, however, a body of research that has looked at the issues of computer and Internet based learning in other areas of education (Darby 1992; Doomecamp 1993; Selwyn, Marriott et al. 2000; Peat, Franklin et al. 2001; Pelgrum 2001). Therefore, it should be possible to identify which issues are relevant to the use of the internet in fashion education.

The dominant approach in traditional art and design education has been based upon the studio system where the emphasis is upon learning by doing, with the expert teacher guiding the novice learners. (Sclater 2001). The Internet is presenting alternatives to this traditional model by providing the tools for
collaboration and distributed learning. These tools have yet to be fully exploited but there are a growing number of projects that are attempting to engage with the technology in this way (Fraser 2001; Griffiths, Russell et al. 2001; Hutton, Bartlett et al. 2001). There are some subject areas in art and design where new technologies have had a major impact. In graphic design, for example, a great number of traditional processes have been replaced by new technologies and the modern practitioner is required to have an "advanced knowledge of software and hardware" (Janczak 2001), familiarity with animation, navigation and other web and multimedia skills. It would be fairly difficult to find a graphic design course where computers are not an essential and integrated part of the curriculum. However, this is not yet the case in fashion education.

The literature on the fashion curriculum is still in the early stage of development. There is a need for fashion academics to engage in pedagogic research into their subject domain and to publish their findings more widely in the academic arena. There are several professional bodies that are beginning to address this situation. The existing literature points to the need for fashion students to have a broad range of skills including IT and communication skills. These skills are important in the development of a critical dialogue and reflective practice. The nature of the fashion curriculum is changing to reflect the changes taking place in the industry, which is moving quickly toward a more digital model. Students entering the industry at the beginning of the 21st century will require IT and literacy skills and knowledge of fabrics.

Summary
This chapter has given an overview of a range of theories relating to the use of technology in teaching and learning. Each of the theoretical approaches examined has strengths and weaknesses. It is possible that a truly progressive pedagogical approach to the use of IT will draw upon the strengths of a variety of these theories selected for their relevance to the particular context, learners, activity and subject domain. There is a general consensus of opinion relating to some aspects of IBL. These include:

- Recognition that students will require Internet and computer skills in order to be able to function in a marketplace that has been redefined by the information age.
- The need for universities to move toward a learner centred approach and, if they are to continue to deliver quality education in an increasingly
competitive environment with limited resources, to consider new technologies to enable this.

- Recognition that the Internet is a flexible environment that enables learners to access a vast array of information but with an acknowledgement that it is also a complex medium. Conducting an Internet search requires high-level problem solving and metacognitive skills, as well as a strategic approach.

- An acceptance that the amount of information available on the Internet creates a unique set of problems for the learner who is unfamiliar with information retrieval strategies and processes. Therefore support is required to negotiate the environment, while developing the appropriate skills.

The Internet is a fairly new phenomenon and as such, the body of research relating to it is still developing. The problems that it presents as a learning tool are apparent, as are many of the advantages and these are clearly charted. The appropriate solutions to these problems have yet to be fully tested. There needs to be a deeper understanding of the meaning of this environment for the individual learner. The underlying assumption that constructivist theories of learning are best suited to IBL needs to be verified in a variety of environments and subject areas and with learners at different stages of the learning process. A body of knowledge is beginning to develop but there does not seem to have been a strategic approach to this by the academic community. The emphasis in the literature seems to be at the earlier stages in the educational process and there is certainly scope for more studies into how educational theories apply to higher education and mature students. The role that the Internet plays or could play in fashion education has barely been touched upon and there appears to be no current research in this area despite the pivotal role that IT is beginning to play in the fashion industry. This study will therefore be bringing forward new knowledge in the field which will hopefully lead to further research and a better understanding of the issues faced by fashion students attempting to use the Internet for research and independent study.

Once the theoretical basis for the design of the learning activity has been resolved there are still many other factors to be taken into account when planning to integrate IBL into the curriculum. The research that has been
undertaken into the implementation of IBL has identified a wide range of issues and barriers that have prevented educators from fully integrating it within the curriculum. These problems are pedagogical, logistical and attitudinal and are explored in more detail in the next chapter.
Chapter 4 Barriers to the Integration of IT within the Curriculum

There is a tension highlighted in the literature between the drive toward technology being promoted by industry and the government and the barriers that are presented by the traditions and resources of higher education. This chapter will consider the barriers that are created by tutors, learners and by a lack of funding and resources. The nature of these barriers will be considered and some of the solutions that have been proposed will be discussed.

The Process of Change

The move toward technology within the curriculum and the changing needs of industry are having an impact on education. The types of skills that students will require in order to be able to function effectively in the information age are also changing (Crawford 1999; Pelgrum 2001). Van Weert (1995) suggests that students will need to have inductive thinking skills, IT skills, the ability to solve problems, communicate, cooperate and deal with a complex working environment. This he argues; will require a shift of focus in education from the basic intellectual skills of reading, writing and arithmetic, to higher order analytical skills or as he describes the situation, from “low-tech to high-tech ” skills (van Weert 1995, p 5). Research suggests that higher education is not yet enabling learners to develop these skills.

A recent HEFCE report (HEFCE 1999/60) lists a range of reasons for the lack of effective integration of C&IT into the higher education environment including:

- investment problems;
- lack of a reliable and adequate infrastructure and network;
- rapid changes in technology;
- lack of leadership and senior management support for C&IT initiatives;
- lack of expertise in various aspects of both courseware design and development and the IT implications;
- lack of a culture in some institutions that supports innovation in teaching.
There have been pioneers in the use of computers and Internet technology within higher education in the UK, but the overall lack of development in this area has been noted by Bates (1995) who criticises educational institutions as being "still pickled in the aspic of the Industrial Revolution" (p 17). This comment is still valid as successive government initiatives seem to have failed to have a massive impact upon the adoption of innovative teaching methods using IT. There are many possible reasons for this lack of progress, one of which was the enthusiasm of the early pioneers of computer technology in education, that was not always accompanied by an understanding of how the media should be used. Bates (1995) stresses the need for,

...new approaches to teaching and learning, that exploit the unique features of different technologies in order to meet the widely different needs of many types of learners. These approaches must be based on the considerable amount of knowledge now available about how people learn and how to design effective learning environments, as well as on a good understanding of the educational strengths and limitations of different technologies. (Bates 1995, p 17)

He also points out that just because a technology is new, it is not necessarily better than other traditional teaching methods. Earlier fears that computers may replace teachers have been rejected by Bates in favour of the use of computers as tools that could be a useful part of the learning experience if used in the appropriate context (Bates 1995). He argues that the technology is not the issue, the design and implementation of the learning experience is what we should be examining.

This sentiment is also evident in the work of Erhmann (2000; 2001a; 2001b) who claims that technology is only one part of the recipe in any learning experience. He states that in many respects technology has been a victim of its own success. The speed at which technology develops has been a key factor in preventing it from being widely adopted in education. The cost of training staff to use technology is extremely high and they have no sooner become proficient in one system or software application than it is replaced or up-dated. Courseware that has taken a long time to develop becomes out dated before it has had the opportunity to become embedded in the curriculum. Erhmann (2000) suggests that instead of trying to use cutting
edge technology, educators should be using tried and tested systems that are reliable, inexpensive and supported in the mass market. The problem, he says, is not the technology but the fact that we do not learn from the mistakes and achievements of earlier users. This view was also promoted by Bates (1995) who claims that “people in general ignore what has been learned in previous contexts” (p 21).

There is a time lapse of five years between these two comments. This is indicative of the scale of the problem and the time that it takes to implement change in a system that has deeply embedded paradigms and structures.

The Role Of The Tutor

Although this research is not directly concerned with examining the role of the tutor, the influence of the tutor in any learning experience cannot be ignored. Part of this study uses a series of tutor supported workshops as the vehicle for the research, therefore the role of the tutor is considered to be relevant. Teachers can have negative feelings toward the use of new technologies in education (Wild 1996). These feelings can be the result of a range of issues. Fear can be a major barrier, teachers may not feel comfortable with the technology and may not know how to use it effectively (Bates 1995; Wild 1996; Johannesen and Eide 2000). They might be afraid of encountering technical problems they do not know how to deal with (Crook 1994). They may be frightened that the computer could replace them or that their authority will be undermined because it challenges their role as holders of knowledge (Forsyth 1996; Johannesen and Eide 2000). They may also be concerned that the Internet will have a detrimental impact on teaching quality (Fayter 1998). Fayter (1998) questions whether lecturers are reluctant to give up “tried and tested” methods. Fayter (1998) and Vermer and Parikh (2001) identify that some educators are concerned about retaining the intellectual property rights to their work if it is published on the web. Benson Soong (2001) and Vermer and Parikh (2001) have identified the mindset of the tutor (and students) as a critical factor in the success of on-line courses. They found that more positive results were achieved where both the tutor and students have a constructivist mindset. The learner centred approach to education has been based upon constructivist theories and Jeffries and Hussain (1998) indicate that teachers are realising that the Internet plays a valuable role in supporting this approach. This is because of the flexibility of the resource and the wealth of information it offers.
Academics in Higher Education face considerable pressure from administration and increased accountability. This has an impact on their ability and willingness to undertake additional work and training (Sosabowski, Herson et al. 1997) and does not allow them sufficient time to keep up to date or reflect upon the impact of new technology upon their practice.

\textit{No doubt partly because both internal and external pressures for accountability, efficiency, effectiveness, personal development, research, statistical data, improved marketing and competitiveness have led to an oppressive bureaucracy which, in many institutions, has wiped out the academic credibility of most staff above the rank of Principal Lecturer, those who should be proposing and implementing radical solutions to major problems are incarcerated in remote offices pushing large volumes of academically irrelevant paper from one side of their desks to the other. They haven't noticed that since Leonardo da Vinci there has been a major shift in the educational resources required to support design activities.\textit{}}

\textit{(Yeomans 1990, p 179)}

Getting staff to use and integrate IT within their teaching may be one of the biggest barriers that higher education has to overcome. The attitudes of staff to technology can be a key factor in the success or failure of its implementation and there are many reasons why they may be suspicious of it. However, many of these suspicions could be based on a lack of knowledge about IT. The answer to a lot of these issues seems to lie in a considered, strategic and well-supported staff development programme (Crook 1994). Littlejohn and Grierson (2001) point to the inadequacies of many staff development programmes, which are not pedagogically driven and the lack of opportunities for staff to engage in and experience online learning. Bates (1995) suggests that to overcome the reluctance of individuals to utilise the technology the government could require that new lecturers have qualifications in instructional design. Comu (1995) suggests that what is required is a totally integrated approach to the use of IT, that a new integrated pedagogy that utilises new technologies as a fundamental component is required. The need for a new pedagogy for the teaching and learning of IT based upon constructivist principles is also argued by Crawford (1999).
The need for a change in approach by teachers is highlighted by Forsyth (1996). He recognises that the Internet will place additional demands upon teachers and their role in the learning process. They will no longer be the only source of knowledge and indeed cannot expect to be completely up to date in their subject area as he argues the old methods of acquiring knowledge are being subjected to competition from the media. He also suggests that it is impossible for subject experts to keep completely up to date with all of the information that is now available because of the speed with which it is updated and delivered (Forsyth 1996).

HEFCE have recognised the need for a strategic approach to staff development in the areas of computer and information technology (C&IT). They note that while there are some national initiatives these are limited. They raise a number of crucial questions relating to how staff can be encouraged to use C&IT in their teaching and learning. These include:

- What the standards should be and who should set them?
- How they can be maintained in such a fast moving environment? (HEFCE 1999/60).

It is important that development and training in IT is not restricted to IT teachers but is also part of the continuing development of subject specialist tutors. This will inevitably lead to more pressures on staff but if they are willing to relinquish the role of teacher as expert and become teacher as collaborative learner this does not need to be the case. This change in role from instructor to a participant in the learning process is also recognised by Beswick (1977) who describes the role of the teachers as "much less the instructor and director, much more the collaborator and adviser." (p 20/21). This collaborative learning process will develop, partly sustained by the speed of change in the technology and development of new software. This will make it impossible for teachers to be completely expert in all aspects of their subject. Fava-De-Moraes (2000) points to a future where the ability to use new technologies will create a gap in the academic community between users and non-users and that the non users may be profoundly affected by the quality and quantity of information available to them. He has no doubt that;
Individuals' ability to access and process information is set to become the determining factor in their integration not only into the working environment but also into their social and cultural environment. (Fava-De-Moraes 2000, p 323)

Tutors who continue to ignore the potential of C&IT risk becoming alienated from the global academic community to which they belong. They will not be fully preparing their students to deal with the shift in emphasis in education from models of teaching that are didactic, linear and based on knowing and understanding, to a technological model "...where multidisciplinary, holistic approaches predominate." (Crawford 1999, online). Tutors play an important role in encouraging students to use new technologies by providing role models (using it themselves) and by "...discussing and negotiating with students what their goals might be in using learning technologies." (Seale and Cann 2000, p 318).

The literature points to the need for tutors to engage with the technology, to accept that it will not remove their role, but will change it. There is a need for careful planning in order to integrate technology successfully. The teacher needs to have the appropriate pedagogical and didactic knowledge to be able to use the technology effectively (Johannesen and Eide 2000). An adjustment to the workload of teachers will also be needed in order to enable them to develop these skills. In addition to time for staff development, teachers need to be supported with access to appropriate well-maintained equipment and technical support. This has profound resource implications.

Funding and resources

Even when lecturers are enthusiastic about using IT in their teaching there are physical, financial and technical barriers to be overcome. The speed of change and the rate of development of new technologies make it almost impossible for any educational establishment to always be completely up to date. Apart from the cost implications, there are human resource and training issues attached to every software up-date. Pelgrum (2001) found that the major problems faced by teachers when trying to incorporate C&IT into their teaching, were an insufficient number of computers, insufficient knowledge and skills regarding C&IT, and a lack of technical support.
Access to a reliable infrastructure (software and hardware) and the appropriate technical support are key factors in the successful integration of IT within the curriculum (Benson Soong, Chuan Chan et al. 2001). The type and level of IT activity that can be delivered will always be dependent upon funding (Harper 1996). It is virtually impossible for many institutions to match the resources that are available in the industry (Yeomans 1990). Yeoman's suggestion to overcome this problem is to place students into industry where there is the equipment, instead of trying to place the equipment into universities that lack the funds to remain current. With small numbers of students this may be possible, but one may foresee problems with this solution with the numbers that higher education is currently dealing with. Handling student placements becomes a specialist job in its own right and many institutions employ a member of full time staff to deal with the courses that already include placements.

The good news is that through the Combined Higher Education Software Team (CHEST) the cost of computer hardware is falling and that nationally negotiated agreements on software purchasing are allowing universities to buy up to date software at reasonable prices. Universities may never be able to afford everything that they would like, so it is important that they develop a curriculum-led IT resource strategy and utilise the potential of the Internet. The Internet itself is making access to IT easier by providing a cross platform accessible resource that does not require expensive software.

Crucially, for universities committed to wide student access, the Internet is breaking the cycle that requires more and more computing power to run ever more complex software. As the saying goes, 'Intel giveth and Microsoft taketh away. (Daniel, 1996, p 120)

Accommodation also plays an important role in the integration of C&IT in the curriculum. As Cornu (1995) suggests, computers need to be available outside of specialized rooms, new integrated environments need to be developed where the computer is not an addition, but is an easily available "invisible" tool.
Role of the learner

The role of the learner is as important as the experience and attitude of the tutor in successfully integrating IT within the curriculum. Much of the current literature on higher education advocates a learner centred model. In this model the learner is expected to operate more independently to find and evaluate information for themselves, instead of relying upon the transfer of knowledge from the teacher (Pelgrum 2001). However there is little evidence that this has had a significant impact upon the way in which the majority of learning in higher education is actually being delivered. Merely providing access to the Internet and IT facilities does not necessarily mean that students will use them (Fava-De-Moraes 2000; Selwyn, Marriott et al. 2000). The role of the learner is vital to the successful integration of C&IT within any curriculum and as Selwyn (2000) points out, it has often been overlooked. Key research questions that are as yet not fully answered are, how students access, use and learn from the Internet, how they conduct searches and how they validate the information? (Windschitel 1998). There are many factors pertaining to the learners that need to be considered when implementing a teaching and learning strategy that includes C&IT. These include the attitude of the user, their previous experience and their ability to access the necessary resources. How the learner is introduced to the technology and the role it then plays in their learning experience, all need to be clearly set out.

Anxiety and Technophobia

Studies have found that students can be very anxious about using technology, “A review of the literature suggests that around one third of the individuals within most populations experience computer anxiety to some degree” (Brosnan 1998 223/4). Crook (1994) identifies that learners may be “feeling resentment over having had inadequate opportunities to gain expertise during their education” or have had “bad experiences of being taught about technology in previous contexts.” (Crook, 1994, p 203). However, Wilson (2000) states that “…experience with computers leads to formation of a positive attitude toward computers in general” (p.69). Dewhurst, Macleod et al. (2000) found that direct experience with computers helped to dispel students’ fears.

Technical Ability & Support

A lack of technical ability can prevent students from engaging in activities such as discussion forums (Seale and Cann 2000). Phelps, Ellis et al. (2001)
suggest that technical ability in itself is not as important as “a capacity to develop technical knowledge” (p 486). However, there is clearly a need for users to have some basic knowledge of how a computer functions and the lack of technical support is identified as a barrier to the use of computers by both staff and students (Johnston and McCormack 1996; Benson Soong, Chuan Chan et al. 2001; Youngblood, Trede et al. (2001). Russel (1995) identifies that “technical support as well as psychological support are important as early successful encounters with the technology will feed enthusiasm and build confidence in the naïve user” (p 174).

**Gender**

The gender of the learner may also be an influential factor in their attitude toward computers, but the effects of these factors are difficult to predict (Wilson 2000). Arbaugh (2000) states that there is “anecdotal and theoretical evidence that suggests men and women conceptualize and use the medium differently” (p 504). The culture of the C&IT is predominantly young, white, male and middle class (Gorard and Selwyn 1999; Gray 1999) and “women continue to be under represented in computing and information technology” (Clegg and Trayhurn 1999, p 75). This monopoly of technology by a narrow social group may have a negative effect upon the claims for the Internet in widening participation in education. However recent studies have shown that women’s attitudes toward technology are changing and that “the main reasons for this shift in attitudes are age, experience, and ownership.” (Arbaugh 2000, p 506). Clegg and Trayhurn (1999) suggest that the effect of gender is complex and that:

> Unwittingly we may reproduce gender stereotypes by counting the computing males do (games), but not counting the computing women do (often working with large data sets and systems).  
> (Clegg and Trayhurn 1999, p 87).

It seems that the gender of the learner is not in itself a barrier but that other factors including access, the expectations of society, and experience are creating barriers for women in computing.

**Resistance to Change**

Lee (2001) proposes that Web-based instruction presents learners with a new situational context to which they need to adapt and perhaps to “deploy different learning styles” (p 123). The ability of the student to adapt may
have an influence upon their success. There may also be resistance from learners who do not “want the traditional dynamic reversed.” (Daniel, 1996, p 25). This he says “…should not surprise us. It is rare for a category of workers to accept, without challenge, that they should become more productive.” Students are also becoming astute consumers. Now that they are paying fees and becoming indebted in order to participate in higher education they are demanding greater value for money. Students may also resent the replacement of some of the face to face contact with their tutors by online contact.

Access
Access to the appropriate software and hardware is also an important factor in enabling students to engage with C&IT. Harriman and Fitz Gibbon (1998) found a link between access, and students’ perceptions as to how difficult they find the technology. Fava-De-Moraes (2000) believes that in a few years time, as the cost of the technology decreases, most HE Institutions will have “comfortable and universal access” (p 320) to the Web. The situation at present however is far from ideal in terms of the level of access, with problems of access to either the appropriate equipment or support being cited in several studies (Dewhurst, Macleod et al. 2000; Benson Soong, Chuan Chan et al. 2001; Pelgrum 2001).

Collaboration and social use
Peer support and collaborative activity are identified as positive factors in encouraging students to engage with new technologies (Crawford 1999; Benson Soong, Chuan Chan et al. 2001). Learning is a social process and collaborative activities encourage students to become active participants, thereby encouraging a deeper approach to learning (Benson Soong, Chuan Chan et al. 2001). There are strong arguments that students also respond more positively to authentic situations and learning experiences (Brown and Duiguid 1996). Jeffries and Hussain (1998) found that students “value use of the Internet for leisure purposes slightly more highly than for other purposes.” (p 362). This is reinforced by Wilson (2000) who found that students were more likely to use the computer mediated communication systems (CMCS) for communicating with family and friends than for group based work activities.

Information Overload
Learners are discouraged from using the Internet when they spend valuable
time down loading information which then turns out not to be what they required. They can also be confused by the volume of information available on the Internet. Selwyn et al. (2000) found that students felt that they did not have the time to develop the appropriate skills, especially if this meant jeopardising their grades. This points to a need for students to have effective search and evaluation strategies if they are to use the Internet effectively. The availability of information is no longer the main problem for students, the biggest issue is how to evaluate and synthesise it. As Abbott (1999) says:

As a species we have grown to the point where, theoretically, everything we have ever known can be put together as information available to everyone. What is needed is more meaningful knowledge synthesis, more 'intelligence', more understanding of the information we already have, and more understanding of the reasons for personal choice. Otherwise, we may become increasingly alienated from our information resource. (Abbott 1999, p 3)

It appears that in order to be valid, any new pedagogy must address the ways in which the learners interact with, and use information.

Information handling and study skills

Learners are coming into contact with more and more technology in their daily lives, but the literature shows that this does not always translate into confidence and competence with IT. Phelps, Ellis et al. (2001) state that "working effectively with computers and IT require creativity, intuition, confidence in managing and learning and in an ability to perform" (p.483). They argue that computer capability is "much more to do with an approach to learning and working than a simply a set of technological skills" (p.483). This will require learners to be aware of the "knowledge and skills they do or do not possess and use appropriate strategies to actively implement or acquire them" (Phelps, Ellis et al. 2001, p 483)

It is important that these skills are not developed in isolation, but are integrated into the students subject area so they can understand how they are used in context (Hunter, 1999, Crook, 1994). The sheer volume of information available on the Internet means that students need to develop "Information literacy" (Williams and Zald, 1997) and advanced searching skills. Hale and Moss (1999) have identified the role of language in
determining the success of an Internet search.

...language has both fixed and flexible dimensions. There are core meanings that are widely understood and other meanings understood only by groups or individuals. The perceptions of subjects undertaking Internet searches are likely to share both of these aspects of language. The Sheffield University Internet Searching Project explicitly recognises that language has both regularities and inconsistencies and that conventional signs have a multiplicity of internal meanings and gradations, with zones of indeterminancy as well as shared meaning i.e. that concepts are hazyspaces. (Hale and Moss 1999a), online)

A lack of these important research skills combined with the vast range of material available can confuse students. James (1995) suggests that offering a "customised interface, i.e. course-related (local/offline) html pages dedicated to the needs of, and accessible to, specific course participants." (online) can help to resolve this situation. Macdonald, Mason & Heap (1998) suggest that students will benefit from help in the development of these skills. Marchionini (1995) argues that in order to deal with the large amounts of information in our lives we have had to develop "complex personal information infrastructures" (p 2). The amount of information available is growing at a phenomenal rate, access to this information in digital form is he says both "enabling and complicating" (p 3).

**Approaches to Information Seeking**

Two key information seeking approaches identified by Marchionini (1995) as browsing and analysis. Browsing is "heuristic and opportunistic" (p 8); It relies on recognizing relevant information, and whilst requiring a smaller cognitive load in advance of the search, it demands a "steadier attention load throughout the information seeking process." (p 8). Analytical strategies require careful planning and are often more effective where there are large numbers of documents or information to be dealt with. Typically, novice users will use informal browsing strategies and expert users will use analytical strategies. (Marchionini 1995). The amount of time that a user will invest in a search is directly related to the perceived value of that information, the motivation of the user, and other external factors such as the environment in which the search is taking place. Browsing for information has limitations because "humans fatigue quickly, especially when doing repetitive tasks". (Marchionini 1995, p 117). It can also be time consuming and less efficient
than taking an analytical approach. Systems that encourage browsing he says, also encourage “cognitive laziness”. The user is under the illusion of being productive, when in fact they may not be reflecting upon the information found or the process in which they are engaged.

Boolean systems upon which many search engines are based, are also quite difficult for novices to use, (Hartley, Keen et al. 1990). They are not very intuitive and “seldom have any mechanism for aiding the user in producing a better query” (Harman 1997, p 413). In defence of Boolean logic Hartley (1990) states that; “It is a logical and flexible way of processing queries to match database records and exploits a quite conventional formal logic”. (p 346)

In order to be able to conduct a search, learners need to be able to use the interface for the search system, to control the mouse or keyboard and to scroll and use commands. However, expertise with a system is less important to a successful outcome than expertise within the subject domain (Marchionini 1995). Hartley (1990) says that:

One proposed theory is that problems arise from an inadequacy in that person’s extent of knowledge. So, if the structures of personal knowledge and problem areas can be better understood the appropriate retrieval mechanisms can be selected. (Hartley 1990 p 358-9)

Therefore, it seems that successful searching depends upon literacy within the subject domain, as well as a basic understanding of the interface being used for the search. The problem faced by users of the Internet is that they are confronted with multiple and ever-changing interfaces that use a wide range of retrieval processes. The major search engines support a bewildering array of search protocols and commands; Searchengine watch.com http://www.searchenginewatch.com provides an in-depth analysis of the different Boolean terms and advanced search options that the major search engines support. Added to this the user must have a sound grasp of the appropriate domain specific terminology in order to select and enter keywords.

Literacy, social exclusion and the Internet.

Literacy is a word that regularly appears in the literature on the Internet.
Information literacy, computer literacy, technological literacy, visual literacy are just some of the terms one comes across, but what is meant by literacy and why is it important?

Literacy is defined by Strassman (1997) as “the ability of individuals to cope with communications within their civilization.” (p 135). Warschauer (1999) argues that literacy exists within a context, that changes in technology have an impact upon the way in which we view literacy and that technology also “intersects with other social, economic, cultural, and political factors to help determine how literacy is practiced.” (p 1). Literacy is therefore defined not merely by the ability of the individual to use a computer or read a line of text, but has wider social implications. A student may know everything about how a computer works, but if they are unable to apply this knowledge in order to communicate in the appropriate language, in the appropriate context, they could not be defined as being computer literate.

Literacy in its more traditional definition, i.e. the ability to read and write also has an impact on learners’ ability to utilise the Internet. The Internet is still dominated by text (Walker 1998) and the way that people interact with text on screen is different to the way that they interact with books, because they can follow links and the flow is no longer linear (Walker 1998; Warschauer 1999). Strassman (1997) points to the significance of “graphic languages” in helping to enrich communication. It is possible that art and design students who are used to communicating visually (and a number of whom have been identified as being dyslexic) may well benefit from the use of graphics to communicate.

Literacy in all its definitions will be important in the way the spread of the Internet affects our world and the future of our learners. Confidence in the use of information and communications technology is part of “the new literacy for the 21st century” (Walker 1998). The Internet whilst representing “the most diversified mass medium the world has ever known.” (Warschauer 1999) is also dominated at present by a relatively small and wealthy elite (Warschauer 1999). In the UK moves are being made to counteract this. Government initiatives are placing computers into communities where there might not otherwise be access. Libraries and schools offer Internet access and cheap Internet access is now on offer on the high street and access
through television and mobile phones is available cutting out the need for a personal computer. However, whether these developments are going to be sufficient to enfranchise the poorest and most disadvantaged in our society remains to be seen. Certainly, there are areas of the world where the Internet is barely visible; "Latin America and Africa each have less than 1% of all the world's Internet sites." (Warschauer 1999). Mansell (1996) argues that:

Even in advanced industrial societies such as the USA and the UK, distinctions and divisions between those who have access to the present generation of information and communication technologies are significant enough to warrant caution and to be sceptical about the grander claims for an information society. (Mansell 1996 p 223)

In a world where commerce and education are becoming increasingly global, access to the Internet and to the education that enables people to use it, is an important issue in ensuring equality of opportunity.

Summary
This chapter has identified that there are a number of barriers to the successful integration of IT within the curriculum. These include:

- The attitudes of both learners and tutors toward the medium
- Lack of resources and funding
- Lack of understanding of the pedagogical issues
- Lack of staff development
- The speed of technological change
- A lack of access to and confidence in the use of computers
- A lack of training in appropriate research and information handling skills
- A lack of literacy in the learners subject domain and the application of computer skills

It appears that mistakes in the way IT has been introduced into the curriculum
have often been repeated. Phelps, Ellis et al, (2001) argue that directive computer training programmes based on step-by-step instructions that have been used in many "organisational and tertiary and contexts" (p 482) do not reflect the approaches taken by experienced and confident users. Erhmann (2000) argues that the technological revolution in education has failed to materialise because there is a propensity to blame the technology. He claims that the mistakes that are being made are not technological but about the broader issues of learning, the ways in which the technology is being used, and the problems of the "human expense" involved in designing and developing courseware that quickly becomes obsolete.

Higher education in the UK still seems to be a long way from achieving its pronounced goals of developing a cohort of learners who are able to function effectively in the new knowledge economy. One of the reasons for this may be that there has been too much emphasis on the technology and not enough emphasis upon learning and the learners. Creative solutions need to be found to address some of the physical problems of access and resources. The approaches that have been taken to the teaching of computer skills need to be re-examined if we are to create learners who are both confident and capable in their use of IT.

The last four chapters have identified the need for the study in relation to current research in the field of Internet based learning and fashion education. The pedagogical and practical issues faced by educators wishing to use the Internet as a resource for independent learning have been explored and potential barriers to the successful implementation of Internet based learning have been identified. As a result of this background research the need for the study has emerged This study will try to ascertain whether:

- The Internet and WWW technology can help fashion students to develop independent research skills
- To identify the specific knowledge and skills required to enable the students to utilise this resource to source fabrics
- To gain an understanding of the individual’s experience of using the Internet as a research tool
The next chapter will outline the methodology used in the study and the theoretical models applied in its development.
Chapter 5

Rationale & Description of the Research Methodology

Introduction
This chapter explains the aims and objectives of the study and the methodological approach that was taken. The reasons for the choice of approach are explained and the ethical issues involved in undertaking the study are highlighted. The research tools are outlined and their relationship to the aims and objectives of the study are explored. Problems that were encountered during the research and the solutions that were found are explained.

Robson (1993) states that some of the most interesting research develops from the convergence of interests between two fields. In this study these fields were fashion design education and the use of communication and information technology to support independent learning. The research was addressing an authentic problem that had been identified in the researcher's teaching practice. The subject area was one that the researcher was familiar with having spent 16 years in further and higher fashion education. The problem was how to help students to develop the necessary skills to source fabrics and materials from wholesale suppliers. As outlined in Chapter 1 this is a complex task requiring a sound knowledge base of fabric characteristics and also good information seeking and communication skills. The study aimed to find out whether the Internet could be a useful research tool in this process. The subjects for the study were a group of students to whom the problem related namely HND Fashion Design and Technology students at the London College of Fashion. Second year students were used for the study as they were at a stage in their programme where the issues being examined were relevant to their curriculum.

Researcher as participant
Stenhouse (1975) proposes that the study of the work of teachers should be undertaken by themselves in the context of their own classrooms and that a teacher's personal research and development should increase their understanding of their own work and in so doing improve their teaching. The researcher in this study was also a participant in the delivery of the teaching sessions. This situation has potential advantages and disadvantages. The
advantages include sensitivity to the situation and issues and the ability to use one's own knowledge and insights to develop a critical understanding of the situation. The disadvantages are that one has to be careful not to bring one's own biases and preconceptions to the research. There "are theorists who argue that objectivity is not really possible" (Minichiello, Aroni et al. 1990, p 214). However, it can be "counted in to the research process" (Minichiello, Aroni et al. 1990, p 215 emphasis in the original) by using a process of critical self reflection.

Patton (1990) argues that qualitative methodologies place a strong emphasis on understanding not only the external behaviours, but also upon the "internal states", (1990, p 47). These include the opinions, values and attitudes of the respondents. This is a very different approach from the detached and arguably objective view of positivist methodologies. It is important for the researcher to acknowledge any bias they may bring to the situation, to examine their own reasons for engaging in the research and to constantly question their motivation and decisions. Patton (1990) points to the work of Piaget and Freud, both of whom were close to their subjects and whose personal experience contributed to their work. He argues that distance does not necessarily equal objectivity, and that being close to a subject does not necessarily lead to bias. He also states that in qualitative inquiry the researcher is the instrument and therefore the validity of the research rests upon the ability and rigor of the researcher.

Robson (1993) recognises that the professional practitioner can utilise their professional and personal qualities to contribute to the investigation. These qualities include the ability to listen, to interpret, to ask questions, to be flexible and to be aware of the potential for bias within the investigation. Many of these qualities are also recognised as desirable in good teaching practice. Critical reflection is part of the professional role of the tutor and these skills were applied to the role of the researcher in this study. This was achieved by a process of continuously examining and questioning the assumptions being made, and noting areas where there was potential for bias. In addition, a colleague of the researcher was asked to consider a sample of the data and carry out preliminary analysis that was used as a comparator for the researcher's analysis. In this way the validity of the researcher's analysis could be verified.

It was also necessary to identify the boundaries between the role of tutor
and researcher, and to recognise that the respondents would be more familiar with the role of the researcher as tutor. To operationalise this the researcher made clear at which point she was moving from one role to the other and reminded the respondents at the start of each interview or observation session that this was the case.

**Ethical and political considerations**

There were several ethical considerations to be taken into account in designing and undertaking the study. After obtaining permission from the London College of Fashion to conduct the study, the first issue was that of informed consent. There were no powerful reasons for the students not to be informed of the nature of the study or its purpose. They were informed orally about how the information would be used, the motivation of the researcher in undertaking the study and were then given the opportunity to ask questions. They were also informed about the steps that would be taken to ensure confidentiality and their anonymity within the study. All of the respondents would be given a code and any materials from which they could be identified, e.g. tapes, would be destroyed once the study was completed. Respondents were told before the random selection was made, in the first stage of the study, that they had the right not to participate and that they would not be discriminated against if they chose not to take part.

The dilemma here was that as their Course Director the researcher also held a position of authority that may sub-consciously have led respondents to be compliant. The researcher was aware of this possibility and therefore at each stage of the study, the researcher checked that the respondents were comfortable with the process and reminded them that they did not have to participate. They also did not have to answer any questions that they were not comfortable with. The researcher tried to be particularly sensitive to any indications (e.g. body language) that a respondent was uncomfortable with any aspect of the investigation. The most important issue for some of the group was not one of confidentiality, but of how much of their time would have to be given to the project. It was therefore necessary to give them reassurances about the time that would be involved and to make sure that this was not exceeded.
Aims and Objectives of the study

Aims

- To identify whether the Internet and WWW technology can help fashion students to develop independent research skills.
- To identify the specific knowledge and skills required to enable the students to utilise this resource to source fabrics.
- To gain an understanding of the individual's experience of using the Internet as a research tool.

Objectives

1. To examine the ways in which students interact with the Internet/WWW.
2. To determine their levels of confidence and ability in using the Internet/WWW.
3. To analyse the students' ability to apply appropriate strategies for independent learning.
4. To identify areas in which students have difficulty in using or applying the technology and to propose strategies that may be useful in overcoming these problems.
5. To apply the knowledge gained to the development of other resources that can be utilised by fashion students undertaking independent research.
6. To evaluate whether the Internet is a useful resource for fabric sourcing.
7. To propose strategies for the integration of the media with other traditional teaching methods.

A case study approach to the investigation was decided upon because the focus of the study was to be upon the experience of the individual within a particular context, and was examining contemporary events. Yin (1994) points to the usefulness of the case study in these circumstances. The case study approach is also flexible, allowing the researcher to use multiple methods of data collection as appropriate, and to deal with a wide range of evidence, including interviews and observations. It was recognised that taking this approach would mean that statistical generalization from the
study would not be possible. However Yin (1994) argues that even though case studies are not generalizable to populations or universes, they can be generalized to theoretical propositions. Black (1993) identifies that case studies can provide valuable insights which are not possible to find in larger and more representative samples. He points to the possibility of enhancing the generalizability of a case study “if some of the relevant variables have been investigated on a larger, more representative scale” (Black 1993 p 56). He also argues that links provided by the literature in the field can support and build upon the knowledge gained through an individual study.

This study would be looking at fashion, a mostly unexplored field of education, where there is a very limited range of relevant literature. There is however a growing literature around the use of the Internet in education which could provide links to the study and where some of the relevant variables have been explored. The study would be small scale and based upon an inductive approach to theory building rather than a deductive approach where there is a pre-existing theory.

A qualitative investigation was decided upon because the scale of the study would not lend itself to meaningful quantitative statistical analysis, and therefore suggested that the research questions would require a qualitative approach. Where quantitative techniques were used, it was with the intention of identifying patterns or themes within the data. Because of the emphasis it places upon an inductive approach the grounded theory approach to theory building, as advocated by Glaser and Strauss (1967), was used to inform the design of the study. It was also used to identify themes and categories within the data. This approach also enables the researcher to adjust the methodology as the research progresses, taking into account new patterns and themes as they emerge. The general principles of grounded theory have been used to inform the design of the study. These principles are:

- The use of open processes rather than fixed methods.
- Questioning gaps, omissions and inconsistencies in the data.
- Generation of theory from and grounded in the data.
- Collecting, coding and analysing data simultaneously.
- The use of inductive processes.
• The use of interviews as a means of data collection.
• The importance of context and social structure.
• Constant comparison of the data both within and across categories.

(Addison 1989, p 41 cited in Moustakas 1994)

A mixture of methods of data collection was identified as being appropriate to the aims of the research. Patton (1990) points out that "methodological appropriateness" is more important than "methodological orthodoxy". The issue, he says,

becomes not whether one has uniformly adhered to prescribed canons of either logical-positivism or phenomenology but whether one has made sensible methods decisions given the purpose of the inquiry, the questions being investigated, and the resources available. (Patton 1990 p 39)

The advantages of being able to fit the method used to the particular situation or circumstance are also outlined by Robson (1993), and in particular the increase in validity that can be gained by using multiple means of data gathering. In a naturalistic, qualitative study such as this, the measures for validity and reliability differ from the positivist "scientific" paradigm. In positivist research, reliability means that the research can be replicated and the same result achieved. In naturalistic enquiries, reliability is dependent upon an in depth explanation of the methodology used including decisions made and the reasons for the choice of tools and methods (Robson 1993). Silverman (1993) argues that in qualitative research authenticity is often a more important issue than reliability.

The research tools were selected to meet the aims of the study whilst offering multiple means of data collection. By using multiple methods of data collection within the study, the aim was to achieve increased reliability and validity by enabling "triangulation" of the data. The aim of this triangulation was not to achieve a crude aggregation of the data but to add complexity to the data and to "reveal different facets of the data" (Coffey and Atkinson 1996 p 15). The stages of the study and the tools used at each stage are illustrated in table 3.1. The design and purpose of each tool are covered in depth later in this chapter.
Figure 5.1 illustrates the process of planning and implementation of the study. In the design and planning stage the tools and sampling protocol were devised and the Research Methods Activity (RMA) was piloted. In the second stage data collection and analysis, the data from the three research tools were collected and analysed in an integrated process. The analysis of the data from each tool informed the next stage of data collection. In the final stage analysis and conclusions, the data from all of the stages of the study were analysed and themes and categories were identified and related to existing research in the field.

Fig: 5.1 Diagram Showing the Design of the Study
The Sample

It is important to note that the researcher was not attempting to apply the sampling logic that would be relevant to a large-scale survey or quantitative study, where one would be attempting to generalise to a whole population. This kind of sampling is not relevant in a study of this nature where the emphasis is upon “analytical generalisation” not statistical generalisation (Robson 1993; Yin 1994). Robson (1993) states that:

Case study is explicitly and avowedly not concerned with samples as far as the case is concerned. It is studied in its own right and no attempt is made to seek statistical generalizability. As has already been suggested, external validity is sought by other means. However other aspects of sampling remain. Important decisions have to be made in case study about things like, how, where, when and from who information is to be gathered. Each of these requires sampling decisions.” (Robson 1993, p 144)

The study was designed so that as it progressed through each stage the sample size became smaller and more focused as the level of investigation became deeper. The use of initial sampling and an analysis of the results as a means for selecting further samples is a recognised method in a qualitative approach. Because the sampling process is guided by the emerging theory, it is sometimes referred to as ‘theoretical sampling’ (Robson 1993). The respondents for the first stage of the study were drawn from across the year group, and then the different specialist pathways within the programme. Table 5.1 shows the number of respondents selected from each pathway at each stage of the study.

Table 5.1: Sample size at each stage of the study. Figures in brackets show intended size of sample next to actual number

<table>
<thead>
<tr>
<th>Pathway on the Course</th>
<th>Group Size</th>
<th>Stage 1 Sample Research Methods Activity</th>
<th>Stage 2 Sample Observations</th>
<th>Stage 3 Sample Interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>Designer Pattern Cutter</td>
<td>33</td>
<td>12</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Accessories</td>
<td>7</td>
<td>2</td>
<td>(2) 1</td>
<td>1</td>
</tr>
<tr>
<td>Embroidery</td>
<td>17</td>
<td>5</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Totals</td>
<td>57</td>
<td>19</td>
<td>(12) 11</td>
<td>7</td>
</tr>
</tbody>
</table>
Table 5.1 shows how the sample size reduced at each stage of the study whilst retaining a spread across the three pathways on the programme. Figures in brackets indicate the intended sample size next to the actual sample size.

The initial sample represented one third of the whole year group and was drawn at random using a lottery method. At the beginning of the first teaching session with each group, the students were asked to write their names on a slip of paper. The slips were then placed in a box and students within the group drew the names. A random selection was used to ensure that there was no bias on the part of the researcher in the initial selection. Students were drawn from across the pathways because the intention was to sample a cross section of the year group. Although the selection method ensured that the sample was random, it did take up 10 to 15 minutes at the beginning of the session and as such was not an ideal technique as it impinged upon the taught session.

The samples in the observation and interview stages of the study were selected to ensure variety but not necessarily representativeness (Stake 1994). The sample selected for observation was twelve students, which represented just over half of the original sample that completed the research methods activity in stage one of the study (see table 5.2). Because one of the sessions had to be cut short a total of eleven observations were completed. The selection of the sample to be observed was purposive in that the data from the Research Methods Activity was used to assist in the selection. The respondents selected had given different priorities to the Internet based resources in the research methods activity and were drawn from across the three pathways. It was hoped that this sample would therefore include respondents with different levels of experience and attitudes toward the Internet. A respondent who gave these resources a high priority should theoretically be using them more often than a respondent who gave them a low priority. The scoring system for the research methods activity is explained in the section on research tools.

After the observations at stage two a sample of respondents to be interviewed was selected. This sample included those respondents who
(based on their comments and actions in the observations) seemed the most confident and experienced with the technology and those who appeared unconfident and inexperienced. At this stage of the study assessments of levels of confidence and experience were based upon the researcher's interpretation of the observation data. It was intended that the interviews would confirm whether these assessments were accurate. Table 5.2 shows the researchers' perception of their confidence and experience at this stage and the respondents selected for interviews.

Only two of the respondents actually appeared to be both confident and experienced. It is interesting to note that these were both male students. There is a body of evidence that shows that women are under represented in computing and information technology (Clegg and Trayhum 1999), that the field of computing is generally considered to be masculine and that masculine ways of relating to the technology are more valued (Stanworth 2000). Whilst an in depth examination of these issues is outside the remit of the study it may be an issue that needs to be considered in the design and use of learning activities using the Internet. There are studies that show that the way in which men and women interact in a virtual learning environment are different (Barrett and Lally 1999; Arbaugh 2000) and this may also need to be taken into account in the design of educational activities. It was important too for the researcher to be aware that her perceptions may also be influenced by expectations of a more confident performance by male students. This was noted so that the perception could be verified or rejected at the interview stage.

Table 5.2: Respondent's confidence and experienced as observed. Brackets indicate that the respondent was selected for interview.

<table>
<thead>
<tr>
<th>Respondent Code</th>
<th>Q</th>
<th>(K)</th>
<th>(G)</th>
<th>(L)</th>
<th>(M)</th>
<th>S</th>
<th>(D)</th>
<th>(E)</th>
<th>(H)</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confident</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Experienced</td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Inexperienced</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Unconfident</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

Seven students were interviewed. Respondent K was extremely softly spoken and although a sound check was done at the beginning of the
interview the respondent was almost completely inaudible on the tape so the decision was taken not to include this interview in the final data. The pattern in table 5.2 seems to indicate that there is a relationship between confidence and experience; this was noted as an area for further investigation in the interviews. Table 5.3 shows the respondents who provided the data for each stage of the study.

Table 5.3: Respondents who provided the data for each stage of the study

<table>
<thead>
<tr>
<th>Respondent Code</th>
<th>Research Methods Activity</th>
<th>Observation</th>
<th>Interview</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>E</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>G</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>H</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>I</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>M</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>N</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>O</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Study

The timing of the study was organised to fit in with an assignment being undertaken by the second year HND Fashion Design and Technology students as part of their course. The first part of the assignment was briefed in July 1999 and gave an outline of three themes, Exploration, Down to Earth and Tailored to Perfection, to be researched and developed in their sketchbooks during their summer vacation. The second part of the assignment forms one part of a subdivision on the programme Professional Studies B, Autumn Term Project. This assignment is used to help the
students to generate a body of work for their portfolios and also prepares them for their final major project. The assignment brings together several strands of their first year study programme including business studies, textile technology, design, research and technical skills. It gives them an opportunity to further practice their skills in these areas and to apply them to a set brief. The assignment asked them to source a minimum of four fabrics for each of the three themes that they were researching. They were to show evidence that they had tried to obtain some of their samples from wholesale suppliers. They were also asked to complete a fabric information sheet for each of the fabrics used in their final range identifying the fibre, structure, finish and other relevant information (see appendix 2).

The objectives of this project relevant to the study were to enable the students to:

- Source fabrics/materials from wholesale sources.
- Identify a range of processes/techniques used in the production of textiles.
- Integrate design, technical development, sourcing and business skills in order to produce an appropriate solution to the brief.
- Use professional communication skills: written, oral, visual and IT.
- Conduct independent research.

The assignment would also help to prepare them for the task of sourcing fabrics for their final major project and develop the sourcing skills that they would need in the industry. The students were supported during the project by a series of workshops, lectures and demonstrations including a series of three sessions on Internet skills. They also had periods of self-directed study.

The Teaching Sessions

The first two of the taught sessions were designed to cover all of the basic skills that the students would require to use the course virtual learning environment (VLE), to carry out an Internet search and to organise and save the information that they found. The third session was to enable the students to apply these skills to their current assignment. Each session was two and a half hours long. The sessions were structured so that key skills
were demonstrated and the students then had an opportunity to practise them. Time was also set aside for discussion about the outcome of the exercises they were undertaking. These teaching sessions on Internet skills were used as the vehicle for conducting the research. The students were shown how to:

- send and receive email using the college system and the VLE;
- use the discussion board on the VLE;
- access the external links section of the VLE;
- use bookmarks;
- use the London Institute Library I page as a starting point for an Internet search;
- create folders to organise their bookmarks;
- scan an image and upload it to the course website;
- download a document;
- use a range of search engines, meta search engines and gateways;
- use advanced search options and Boolean terms to refine their searches;
- search for and save images;
- use a URL to identify the source of the information;
- use navigation tools.

The sessions ran between the 15th October 1999 and the 13th of November 1999. The sessions started with a demonstration of the techniques to be covered. The students were then given tasks to carry out independently. The researcher delivered the sessions and also used this experience to inform the study by reflecting upon the teaching experience and the problems that the students faced in carrying out the exercises and using the VLE. In the first sessions it became clear that approximately one third of the year group had either never logged on to the Institute Intranet or had hardly used it since their induction to IT in the first year of the programme and had forgotten their password. This meant that the first session had to be re-structured to allow time for getting each student logged on to the system. In the first session the students were shown how to access the VLE and enrol.
The researcher then demonstrated how to use the Email, and discussion board to communicate and the external links section to access the Internet and the Library I page.

The researcher demonstrated each activity then the students were asked to practice sending emails to each other, posting items on the discussion board and book marking links from the Internet. The majority of the students had to be shown how to create a folder for their bookmarks and did not seem to be aware that they had a home drive on the Institute server despite the fact that this is covered in their IT induction in the first year. They were also shown how to scan in their photograph and put it on their homepage on the VLE. Some of the students managed to complete the scanning in the first session those who did not were asked to do it during the second session.

The scanning presented a challenge as there was only one scanner and students arrived at the second session having missed the first. A solution was found to both these problems. The students who had attended the first week but had not completed the scanning were organised into teams. The leader of each team was shown how to scan the photograph and up-load it to their home drive from where it could be placed on the VLE homepage. Each team leader then had to demonstrate this to the next person in their team who then demonstrated to the next student until all the team had completed the scanning. Whilst they were waiting for the scanner they were asked to carry out the exercises covered at the beginning of the session. Whilst the advanced students were carrying out these exercises the latecomers were brought up to date. The scanning exercise worked very well in that all of the students who had provided a photograph managed to scan and upload it. They only needed help when the computer froze.

In the second session the students were shown how to use the London Institute Library Web Guides and the differences between search engines, meta-search engines and gateways were discussed. None of the students knew what a meta-search engine was and very few could name a gateway that they had used. The advanced search options on Alta Vista and Excite were demonstrated including the facility for an image search on Alta vista. The various Boolean terms that could be used to expand or refine a search and the different sources of information on the Internet, government,
commercial and educational were also discussed. The students were given the keywords textiles, fashion and footwear to try on different search engines to see how the results differed. The group then discussed the results of this exercise, which generated very different results depending upon which search engine was used. The teaching plans for these sessions are in appendix 3.

In the third session the students were asked to use the skills and information they had covered in the previous sessions to try and find information including fabric suppliers for their current project. Throughout all three sessions the majority of the students required support to complete some of the tasks. They sought this support either from the tutor or from those who were seated near to them. This informal collaborative approach was evident in all of the sessions despite the fact that the layout of the room was not very conducive to this type of activity. The students were confused by the layout of some of the search engine front pages. They had difficulty in locating the search box or the results of their hits, which they often had to scroll down the page to find. It was noted that they often mis-spelt keywords. The identification and spelling of appropriate keywords was especially problematic for some of the overseas students for whom English was not a first language.

The range of terminology that the students used was very generic and often lacked focus. For example they would search for fabrics or wool but would not use specific terminology for structures or finishes. A small number of the students had some difficulty with controlling the mouse and using the drag and drop features. This suggested that they had minimal computer experience. Once they had found a site with a supplier they wanted to contact some of the students needed encouragement to use the email facility to request samples and help with how to word their request.

Informal verbal feedback throughout the sessions suggested that the students were gaining new knowledge about the Internet and ways of accessing and retrieving information from it. It was clear that many of the students had not been using the Internet as a research tool at all or had been doing so with no real understanding of how to use it effectively. Many of them expressed gratitude at being shown how to speed up their searches using the methods demonstrated.
There were also some practical obstacles to be overcome that arose during the taught sessions. For one of the sessions the group arrived to find that the room had been double booked. Fortunately both of the groups were fairly small and it was possible to proceed with the session by sharing the room. This was not ideal because it was not possible to use the data projector. This meant that techniques had to be demonstrated to groups of 3-4 students sitting around an individual computer. However the session went well despite the problems and it was possible to cover all the topics for that session. One session had to be cut short because rain started to pour through the ceiling of the computer room causing one of the computers to short circuit. Throughout all of the sessions the computers regularly froze whilst using Netscape and had to be rebooted. This slowed the sessions down and led to a lot of frustration for the students and for the tutor. Download times on the system and response times from the VLE server which was situated in the USA could also be frustratingly slow.

The experience of delivering the sessions gave the researcher an insight into what some of the key issues might be for students using the technology as a research tool and for lecturers trying to integrate the Internet into their teaching. This experience was used to inform the design of the research tools in stages two and three of the study. In particular it highlighted the need for tutors to feel that they are working with a reliable system so that they have confidence that they can include it in their teaching.

The Research Tools

In the three stages of the study three research tools were used. A variety of tools were selected in order to enable triangulation of the data and meet the objectives of the study. The first tool was in the form of a research methods activity that respondents were asked to complete. The second tool involved observations of respondents using the Internet and the third tool took the form of semi-structured interviews. Table 5.4 shows how the tools related to the aims of the study. Each tool and its relationship to the objectives are described in detail later in this section.

Stage 1: The Research Methods Activity

The purpose of the research methods activity (RMA) was to determine the research sources and processes that students were using and the order
of priority they gave to particular research activities when engaged in independent learning. This would help to identify the resources that were being used and may be useful when used in conjunction with the Internet (objectives 5&6). It would also give an indication of the priority students were giving to the Internet as a research tool. The activity took the form of a list of resources and activities that were available to the students. Six general areas of research activity were covered, fabric research, trend research, theme research, general background research, resources used and developmental activities. Each activity was on an individual card so that there was no pre-defined order for the respondents to follow. The respondents were asked to give each activity or resource a number relating to the order in which they would usually use that resource or carry out a particular activity. A number 1 indicated the activity that they undertook first. They could give the same number to processes that they would normally do simultaneously and were asked to mark with an X any activity or resource that they would not normally use. The range of resources and activities is listed in table 5.5.

Table 5.4: Research Tools and Their Relationship to the Aims of the Study

<table>
<thead>
<tr>
<th>Objective</th>
<th>Research Methods Activity</th>
<th>Observations</th>
<th>Interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>To examine the ways in which the students interact with the media</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>To determine their levels of confidence and ability in using the media</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>To analyse the students’ ability to apply appropriate strategies for independent learning using the Internet</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>To identify areas in which students have difficulty in using or applying the technology and to propose strategies that may be useful in overcoming these problems</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>To propose strategies for the integration of the media with other traditional teaching methods</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>To apply the knowledge gained to the development of other resources that can be utilised by fashion students undertaking independent research</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>To identify whether the Internet is a useful resource for fabric sourcing</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
Table 5.5: List Of Activities And Resources In The Research Activity Tool

<table>
<thead>
<tr>
<th>Fabric Research</th>
<th>Trend Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select fabric</td>
<td>Look at trend forecast publications</td>
</tr>
<tr>
<td>Look for fabric suppliers in trade directories</td>
<td>Research fabric trends</td>
</tr>
<tr>
<td>Contact wholesale suppliers</td>
<td>Research colour trends</td>
</tr>
<tr>
<td>Visit retail fabric suppliers</td>
<td>Decide on colour palette</td>
</tr>
<tr>
<td>Resources Used</td>
<td>General Background Research</td>
</tr>
<tr>
<td>Visit the college library</td>
<td>Search for relevant newspaper articles</td>
</tr>
<tr>
<td>Visit specialist/other libraries</td>
<td>Search for relevant articles in the trade press</td>
</tr>
<tr>
<td>Do an Internet search</td>
<td>Conduct market research</td>
</tr>
<tr>
<td>Look at fashion magazines</td>
<td>Developmental Activities</td>
</tr>
<tr>
<td>Search the library OPAC</td>
<td>Sketch initial ideas</td>
</tr>
<tr>
<td>Contact relevant trade associations</td>
<td>Develop ideas through exploratory drawing</td>
</tr>
<tr>
<td>Look at relevant CD ROMs</td>
<td>Develop ideas in 3D (modelling/maquettes)</td>
</tr>
<tr>
<td>Visit relevant exhibitions/art galleries</td>
<td>Sample with the selected fabrics</td>
</tr>
<tr>
<td>View relevant videos (TV footage and/or films)</td>
<td>Theme Research</td>
</tr>
<tr>
<td>Look at fashion Internet sites I know</td>
<td>Decided on theme</td>
</tr>
<tr>
<td>Visit fashion stores</td>
<td>Collect visual images relating to the theme/topic</td>
</tr>
<tr>
<td>Look at lifestyle magazines</td>
<td>Research into background of theme/topic</td>
</tr>
</tbody>
</table>

The research activity was piloted using four tutors from the course in September 1999. Tutors were used for two reasons. They were asked to identify any activities or resources that had not been included in the list that they felt were valid. Also the students were not available at the time, the term did not start until October and there would not have been time to pilot this aspect of the study using students before the first taught session. The tutors were also asked to feedback whether they understood the instructions on how to complete the activity and whether they had any difficulty in completing it. Feedback from the tutors indicated that the instructions were clear and that they had no difficulty in completing the task. One tutor said that they would also have visited trade fairs. Whilst this was a resource that students would use once they entered the industry, it would not be an option normally available to students when undertaking research.
for a project. Most trade fairs do not take place in the UK, and many do not usually admit students, therefore this resource was not included. No adjustments to the task were considered to be necessary.

The results of the pilot (see appendix 3) were also used to test the method of analysis. The scores for each activity were entered into an Excel spreadsheet and these data were sorted to reveal the order in which each research task was undertaken. A low score indicated that the activity was undertaken or the resource was generally used in the earlier stages of the research process. The score for each element was achieved by adding together the numbers allocated by each respondent and then dividing this score by the number of respondents. Where an X indicated that the resource was not used a nominal value of 32 was given as there were 31 elements in the set and this would identify an activity not undertaken from one that had been given a score of 31. Where a respondent failed to enter a number a zero was used and then the respondent was removed from the calculation for that element. The data was then sorted and charts created to illustrate the patterns generated by the data. These charts included the number of respondents not engaging in a particular activity and the score allocated to each particular activity (see Appendix 4 Data from the Research Methods Activity).

The data from this tool were used in conjunction with the data from the observations (stage 2) to inform the design of the interview schedule that was used in stage three. For example the data from stage 1 identified resources that may be useful but were either not being used or were being given a low priority. Trade directories were one such example. Questions about use of these resources could then be included in the interviews.

Stage 2: The Observations

The purpose of the observations was to help to identify what was happening when the students tried to use the Internet to find information about fabrics. They also served as a means of gathering data to identify the types of learning outcome and skills that were needed when using the Internet for research and to inform the direction of the interviews.

There are two main approaches to observations. The more formal coded
schedule approach defines the information to be recorded in advance and in so doing ignores other aspects of the situation under observation. The narrative approach is more closely linked with the naturalistic approach to enquiry and is more flexible allowing the researcher to make decisions about the information recorded. This, however, can make the data more difficult to analyse (Robson 1993). The narrative approach fitted more closely with the nature of the study. The research questions, responses to the research methods activity and the researchers’ experience in delivering the taught sessions were used to provide a framework for the observations but no a priori assumptions were being made about what may or may not happen. The decision was taken not to produce a coded schedule in advance as this may have led to a narrowing of the data collection.

It was recognised that the simple act of observing behaviour may well influence the situation under observation (Robson 1993). The reliability of observation as a method of data collection has been questioned because it is possible for different observers to record different aspects of the same situation (Silverman 1993). This did not present a problem in relation to this study as the observations were being used in an exploratory form in order to inform the design of the interview schedule. It was also recognised that within the observations it would only be possible to gain a “snapshot” of the students’ experience of using the Internet. Although the observations were exploratory in form, broad categories were used as a focus for analysing the data. These categories were derived from the aims of the research and the experience of teaching the three sessions on Internet skills. These preliminary categories were:

- Confidence.
- Knowledge of computer functions.
- Fabric knowledge.
- Motor skills.
- Search strategies.
- Terminology used.
- Literacy.

The students to be observed were asked to use the Internet to find fabric suppliers that might be useful for their project. The original intention had been to take notes as the students were using the Internet. In the first
observation session it proved to be quite difficult to keep track of what was happening on screen and take extensive notes at the same time. These difficulties would have come to light had there been time to pilot the observations but the timescale of the assignment did not allow for this. The decision was taken to tape the observations wherever possible. One of the subjects would not agree to this and in order to respect her wishes and comply with the ethical approach to the research this was accepted. In this instance note taking was used. The observations were taped on an audiostreamer, the students were asked to "talk through" what they were doing and the researcher used a series of questions, commentary and the verbal feedback from the students to provide a narrative. The use of verbal feedback during a task is often used in usability tests and enables the researcher to "gain more accurate information than during retrospective verbal reporting". (Hara and Kling 1999)

This proved to be extremely effective because it was possible not only to observe what the students were doing but also to ascertain why. This approach meant that the observations were partly participatory in that the researcher would intervene to ask questions about what the student was doing and why they had made a particular decision. There were also times when the respondents would ask for help when they got stuck or did not know how to continue their search. This dialogue was part of the process of discovery and was extremely valuable in identifying gaps in the respondents' knowledge. In the session where taping was not possible notes were made during the session and immediately after.

The length of time required for the observations was also something that had to be re-considered. The first observation showed that very little could be accomplished in the ten minutes originally allocated. The decision was made to let each session run to a point where there was a natural break, finishing when it made sense to do so e.g. when the student gave up, the computer crashed for the second or third time, when no more data were forthcoming or when the student got what they considered to be a successful conclusion. This flexible approach made much more sense (especially given the instability of Netscape, 10 minutes could be wasted recovering from a crash). It provided an opportunity to continue an observation when something interesting was happening rather than ending it when the time was up. After the first session a decision was made to conduct the
observations outside of the teaching sessions wherever possible. Because many of the students in the groups were fairly inexperienced in the use of the Internet and the network was very unstable, they required much more support than had been anticipated when the study was designed. The researcher did not want the research to have a negative impact upon the students' learning. Respondents were asked to stay on at the end of each session to participate in the observations. This enabled the researcher to focus upon the observations without being interrupted and ensured that the research would not interfere with the learning process.

The initial problems with the observations were quickly overcome by adjusting the methodology and they provided a rich source of data from which it was possible to identify issues and themes to be investigated in more depth in the interviews. The observation tapes were transcribed and together with the notes they were analysed to identify issues and themes. These issues were entered into a chart and then organised according to themes that were originally identified as being relevant to the objectives of the research and other themes that emerged from the observation data. These included technical issues, web content, attitudes and useful strategies. It was also noted whether the outcome of the search was successful in that the student found a supplier of the type of fabric they were seeking.

The data were also organised according to Gagné's Taxonomy as described in Chapter 3, (Gagne, et al. 1992) to identify which of the five types of learning outcome needed to be addressed in order for the students to use the Internet effectively as a research tool for fabric sourcing. (Gagne, et al. 1992)

The observation data and reflection upon the teaching experience were also used to identify the external conditions that would need to be met in order for the student to be successful and effective in their search.

After much consideration a decision was taken to extend the length of the study (originally to be completed by Easter 2000) into the summer term. This would allow more time to analyse the data from the observations and to refine the interview schedule. It would also enable the researcher to see if the respondents had benefited from the instruction they had received during
the assignment when they came to do the research for their final major project. This also gave the research a more longitudinal character.

Stage 3: The Interviews
The interviews were designed to explore in more depth, the issues that had arisen from the data collected in stages one and two. The interviews were the vehicle through which the student’s perceptions and feelings about the Internet and their knowledge of textile sourcing could be explored. Semi-structured interviews using an interview guide to provide a focus were selected as the most appropriate tool for this stage of the study. The interview guide provided an aide-mémoire of relevant issues to be covered whilst allowing the researcher to change the wording of questions, ask them in a different order, to omit inappropriate questions or ask additional probing questions, in response to the flow of the interview and the emergence of new themes. (Minichiello et al. 1990)

This method was selected in preference to a more structured approach because it is more flexible and in keeping with the humanistic or naturalistic approach to research. In a semi-structured interview the respondent has more control over the direction of the interview and there is a greater opportunity for the emergence of themes that the researcher may not have already identified. The design of the interview guide was informed by:

- The objectives of the study.
- Data from the research methods activity.
- Data from the observations.
- The researcher’s reflection upon the delivery of the taught sessions.

The interviews started with broad introductory questions designed to help the respondent to feel at ease. (Minichiello, et al. 1990). The Interview guide was piloted by interviewing three students who were not in the study. The questions were designed to relate to the objectives of the study but also to take into account the themes and categories that had arisen in the research methods activity and observation data. Some of the questions had to be re-worded as they were unclear and respondents seemed confused by them.
A good example of this was the question relating to the use of information from other parts of the course, which was re-worded to be more specific about what these areas might be. It became clear through the pilots that some of the more specific questions may not be relevant if the student had little or no experience of using the Internet e.g. Which sites on the Internet do you visit most? These questions were left on the guide to be used if appropriate to the respondent's level of experience. The guide with both pre-pilot and post pilot questions is in appendix 6.

The interviews took place during the summer term, May and June 2000. Seven of the students who had been observed were interviewed. The interviews took place in an office at the site on which the students were working. This ensured privacy and the minimum of disruption for the student. The purpose of the research was reiterated and the respondents were reassured of their anonymity and the confidentiality of the information given.

The interviews were taped using a cassette recorder; this left the researcher free to concentrate upon the responses and meant that there was an accurate record of the raw data. The preservation of this data allowed for subsequent checking of responses thus enhancing the validity of the interpretation (Minichiello, 1990). On one of the interview tapes the respondent who was extremely softly spoken was completely inaudible and therefore, as has been stated, the data from this interview was not included in the final analysis.

It is important to acknowledge the limitations of interviews as they do not represent authentic situations nor do they enable us to see how respondents "actually perform a wide variety of daily activities". (Coffey and Atkinson 1996, p 7). It was for this reason that observations were also used as a source of collecting data, making triangulation of the data possible.

Methodology for the Analysis of the data.
In designing the methodology, consideration was given to how the data would be analysed. The methodology employed for analysing the data was based upon the principles of qualitative data analysis outlined in key texts in the literature (Glaser and Strauss 1967; Patton 1990; Strauss and Corbin
Robson (1990; Robson 1993; Denzin and Lincoln 1994; Miles and Huberman 1994; Coffey and Atkinson 1996). Much of this literature builds upon the work of Glaser and Strauss (1967) that advocated a methodology for developing theory that is "grounded in data systematically gathered and analysed" (Strauss and Corbin 1994, p 273).

Robson (1997) suggests, "there is no clear and accepted set of conventions for analysis" (p 370) of qualitative data. He advocates "playing" (p 378) with the data, constructing and reconstructing it in order to form comparisons. It is he says in the reflection upon, and systematic analysis of the data that patterns and categories begin to emerge. It is important not to come to conclusions too early in the process or to put off any analysis until all the data is collected.

A coding system using keywords that appeared in the data was used in order to begin the analysis. Coffey and Atkinson (1996) describe coding as a way of organizing the data into "meaningful categories". It is not a purely "mechanistic activity" because in coding the data one is selecting from the data and interpreting it. The purpose of coding is to "generate ideas and broader conceptual frameworks." (Coffey and Atkinson 1996, p 48) 3. This view is reinforced by Miles and Huberman (1994) who state that "coding is analysis. To review a set of field notes, transcribed or synthesized, and to dissect the parts intact, is the stuff of analysis." (p 56). Having developed these initial categories the data was arranged in various charts and matrices to illustrate the themes that were emerging and to compare themes within and across the categories and the three different stages of the study.

Analysis of the Research Methods Activity

The scores allocated by each respondent were used to generate a mean score for each element (research activity or research resource) using an Excel spreadsheet. The data were then sorted to show which elements had the lowest scores (indicating that they were used most often at the earlier stages of the research process) and those, which had high scores (indicating that they were not used as frequently or as early in the research process). Resources that were not used by some of the respondents and the percentage of respondents not using them were also identified from the data. The scores given to resources specifically relating to textiles sourcing
and the Internet were also compared with the overall patterns of resources used and activities undertaken. The data and charts created in this process are in Chapter 6 Data presentation and analysis.

Analysis of the Observation data
Data from the observations were analysed using two different processes. The first process used Gagne's taxonomy of five kinds of learned capabilities:

- Intellectual skills.
- Cognitive strategies.
- Verbal information.
- Motor skills.
- Attitudes.

The five categories of learned capabilities were used as a means of identifying and classifying the range of skills that students using the Internet for research would require. External factors that might influence the outcome of a search were also identified. These factors include issues relating to hardware, software, content and design of web sites and the learning environment.

The intention in using this process had been to use Gagné's methods to devise an instructional curriculum map (ICM) that would assist in the realisation of objective 6 of the research:

6. To apply the knowledge gained to the development of other resources that can be utilised by fashion students undertaking independent research.

It was hoped that by applying “instructional task analysis” as defined by Gagné (1992) that it would be possible to devise a computer based package that would guide the students through the process of using the Internet to source fabrics effectively. In the process of developing this ICM several problems arose in trying to apply the taxonomy. Gagné points to two types of task analysis, procedural task analysis and learning task analysis. Procedural task analysis breaks down a task into the steps that must be performed in order to complete the task. This was fairly simple at a very basic level for example logging on to the computer, launching the browser etc. However, when it came to the more sophisticated and complex parts of the learning, selecting an appropriate keyword, for example, questions arose about the validity of this approach. This task was in itself complex,
dependent upon other supporting knowledge and the cognitive processes of the learner.

The data generated by the observations and the experience of delivering the taught sessions indicated that conducting an Internet search was not a linear process that could easily be broken down into step-by-step (Gagné type) instruction. There were several routes to a successful outcome and many variables that could impact upon the students' ability to carry out a successful search. There were some elements that were dependent upon others, for example if the student could not control the mouse it was very difficult for them to do anything else. They also needed to be able to launch the browser and enter a key word in the search box but beyond these entry-level skills the picture became much more complex.

It was difficult to decide at which level in Gagné's hierarchy of intellectual skills a particular skill belonged. Discrimination is placed at the bottom of the hierarchy. Gagné (1992) uses "the discrimination of differences in woods, metals, textiles, papers, forms of printing" (p 58) as examples of what he calls a "very basic kind of intellectual skill". This definition seems to be erroneous in the context of modern textile technology. Textiles are incredibly complex and in order to discriminate between them even on a fairly basic level a student would require a lot of underpinning knowledge in order to complete the task. The student may have a formed concrete concept of a class of fabrics called silks or synthetics but actually being able to identify a fabric can be much more complex because there are many elements that come together to create a fabric including fibres, yarns, construction, and finishing (Humphries 2000).

The process began to feel very artificial as if one were trying to fit learning into neat little boxes when in fact the task under examination crosses boundaries and various skills and elements of knowledge come into play at several different stages within the learning process. There was not an easy fit between the taxonomy, which is fairly rigid in its structure and the medium under examination, the Internet, which is widely acknowledged as a flexible learning environment that is constantly evolving (Johnston and Cormack 1996; Fayter 1998; Dewhurst, Macleod et al. 2000). The taxonomy was useful in that it identified the range of learning outcomes.
and the internal and external conditions that were needed for students to complete the task but it seemed that continuing with this methodology was inappropriate for the type of learning being explored. After several attempts at creating an instructional curriculum map as advocated by Gagné it was decided to explore alternative ways of using the data to develop resources based upon the themes and categories that were emerging from the data using constructivist principles.

The need for the activity to be authentic and to be situated within an authentic environment is a key theme in much of the literature on teaching and learning and is equally appropriate when using CBL and the Internet (CTGV 1993; Fischer and Scharff 1998; Owen 2000). With this in mind the researcher decided to explore the nature of an online learning environment for textiles and how this might best simulate the real world. Using the data from the study several key resources were identified which would need to be included in the design of an online resource for textile sourcing. These included a glossary of textile terms, links to key sites on the Internet, a search facility, textile identification information and terminology used in the wholesale supply chain. The design and nature of this resource are illustrated in Appendix 13 (The Textile Studio).

The second method of analysing the observation data was based upon the principles of grounded theory. The data from the tapes and notes were coded and key themes were identified. An observation chart (appendix 7) was drawn up identifying themes and issues that arose. This was used to identify preliminary categories that were relevant to the objectives of the study. The relevance of these categories was to be explored in more depth in the interviews. A typist was engaged for the purpose of transcribing the interview tapes. The transcripts were then checked against the tape recordings for accuracy. The decision was taken not to use a computer programme for analysis of the data even though this may have made the process quicker. The researcher preferred to work manually and thus become immersed in the data. However a word processing programme was used to cut and paste text to organise it into categories and Microsoft Excel was used to generate the charts and tables. The data from the interview transcripts was read thoroughly, preliminary categories were identified and key words highlighted. Themes that emerged from these notes were given
provisional titles. The categories that were identified in the observations were used as preliminary themes for the interview data. Further categories that arose in the interview data that had not been identified in the observations were noted and the corresponding data was sorted into a table and given operational titles. Table 5.6 identifies the themes that arose from the observations and additional themes from the interviews.

Table 5.6: Themes identified in the observations and interviews

<table>
<thead>
<tr>
<th>Themes identified in the Observations</th>
<th>Additional Themes identified in the Interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confidence</td>
<td>Experience /Level of Use</td>
</tr>
<tr>
<td>Knowledge of computer functions</td>
<td>Social use &amp; Collaboration</td>
</tr>
<tr>
<td>Fabric knowledge</td>
<td>Anxiety</td>
</tr>
<tr>
<td>Motor skills</td>
<td>Time</td>
</tr>
<tr>
<td>Search strategies</td>
<td>Access</td>
</tr>
<tr>
<td>Terminology used and literacy</td>
<td>Support</td>
</tr>
<tr>
<td>Attitudes</td>
<td></td>
</tr>
<tr>
<td>Useful strategies</td>
<td></td>
</tr>
<tr>
<td>Web content issues</td>
<td></td>
</tr>
<tr>
<td>Technical issues</td>
<td></td>
</tr>
<tr>
<td>Environmental issues</td>
<td></td>
</tr>
</tbody>
</table>

The relevant responses of all the respondents were then arranged under each of these headings. In this way it was possible to check the responses of an individual across all categories and the responses relating to a particular category across all respondents. An issue was identified as a category if it related to two or more of the respondents. Issues that were relevant to an individual but had a direct relationship to a category were also noted. For example dyslexia was reported by one respondent but had a direct relationship with literacy and confidence and although it related to only one respondent its impact upon that respondent was profound.

The specific response or group of words that related to each category was entered into a table under the appropriate heading and referenced to the respondent. Responses relating to a particular theme were brought together under a series of sub-headings. For example under the heading of attitudes- responses were identified that related to the themes of time, access, confidence, frustration, technical information, literacy, social use, collaboration and content. The themes that emerged were checked back against the data to ensure that the data within a particular category were
“meaningful” i.e. that there was strong enough evidence within the data to justify the categorisation and that the categories were “bold and clear” (Patton 1990). The data were then checked to ensure that the categories included all the appropriate data and information and that these had been appropriately placed (Patton 1990).

To make sense of the data they were reduced and displayed utilising the techniques described by Miles and Huberman (1994). A series of matrices were devised to display the data in a format from which, comparisons could be made and conclusions drawn. The reduction, display and verification of the data all played a part in the analytical process (Miles and Huberman, 1994). Deciding upon the format of the matrices helped to clarify the relationships between categories and verify or reject some of the conclusions formed earlier in the process of sorting the data. The analysis of the data concentrated upon looking at the underpinning issues relating to these themes and their relationship with one another in order to try and gain a holistic view of the respondent’s experience. For this reason a profile of each respondent was also drawn up. This made it possible to identify the interrelationships between categories as they affected the individual.

The core categories and sub categories were organised into a “conceptually clustered matrix” (Miles and Huberman 1994. p 127) so that the range of responses relating to a category could be compared. For example, the responses relating to confidence varied in their intensity from mild apprehension to being “scared”. These matrices are presented and explained in Chapter 6 (Data Presentation).

**Follow up study**

The decision to undertake a follow up study two years after the original study was taken for a variety of reasons. The data from the original study had identified a number of themes that justified further exploration and the follow up study may add further depth and texture to the data. It was recognised that the rate of development and change within both software and hardware happens at such speed that some of the issues raised in the original study may already have been addressed or further issues may have developed. Although there was no intention in the original study to generalise to other populations it may be possible to identify issues that
continued to be of significance to student groups engaged in the same area of study or to identify further issues not covered in the original study. The further study would also present a means by which the validity and reliability of the original analysis could be checked.

The aim of the follow up study was not to replicate the original study, which would not have been possible as the conditions were different. The students in the original study had moved on and the curriculum had been adapted and developed. There would also not have been time to replicate all of the stages of the original study. Instead it was decided to repeat the observations with another small random sample of students to see if the same issues emerged and whether the categories originally identified were still relevant.

The observations were undertaken in the autumn term of the 2001/2 and were conducted at the end of taught IT sessions delivered by the researcher. One student was selected at random from each of the four Year Two HND Fashion Design and Technology groups who were involved in these sessions. These were designer pattern cutter and embroidery students. A month of the year was selected at random by the researcher before each session and a student from the group whose birthday fell in this month was asked to participate in the study. If there was more than one student with a birthday in that month then the names were drawn out of a "hat". This method took up less of the teaching session than the lottery system used in the original study but still ensured that each student had the opportunity of being selected.

The teaching sessions differed from the sessions in the original study in that they were focusing upon the use of a software package called Artworks. The course web site had been moved during the summer from the Blackboard server in the USA to a server within the London Institute. At the beginning of the first session the students had to download some image files that had been emailed to them via the course website. The exercise was devised as a means of checking that all of the students were logged on to the site and knew how to use the new system.

This activity identified a series of issues. These second year students
had access to the course website for a year and a half, an induction onto the system and were involved in Internet based projects during their first year programme. The students had been given an information sheet on how to log in to the new site. The modifications in the new site had been demonstrated to them and there was a help link they could use to get assistance. The expectation was that given this amount of input they would be fairly capable at using the Internet and the course website. In reality this was not the case. There were several students in each group who had not logged on or had done so but had not entered an Email address in their information. Some students did not know how to open an Email attachment or how to save it, and most of them had to be shown how to create a folder on their home drive in which to save the files. What should have been a simple operation could take up to three quarters of an hour at the beginning of the session. The problems continued into the second session because some students had not attended the first. One student whose attendance was not good seemed not to have received any of the information and was still trying to log into the old site in the USA that he had bookmarked. The exercise was extremely valuable as it highlighted the need for further input on Internet skills and the modified VLE for this group of students. It also explained why some had not received course related information.

The selected respondents were asked to stay at the end of the session. The nature of the research was explained to them, they were given the opportunity not to participate and the issues of anonymity and confidentiality were discussed. They were asked to use the Internet to try and find some fabric that would be useful for their current project. Their actions and thoughts were tape-recorded using the same narrative approach as in the original study. Notes were made immediately following the sessions. The participants had been kind enough to spare some of their lunch hour in order to take part in the study and by way of compensation at the end of the observation the researcher gave the respondents a few tips on how to improve their Internet skills. This meant that the respondents gained a direct benefit from their participation. The tapes were then transcribed and the transcripts checked against the tapes for accuracy. The data were analysed using the same approach as in the original study. These data were then checked against the original categories to identify overlaps, omissions and additional categories.
Summary

The flexibility of the case study approach made it possible to adjust the methodology as problems arose (with the observations for example) without compromising the validity of the study. Each stage of the study was useful because it added texture and depth to the data. However, the whole process of gathering, organising and analysing the data did take longer than had been anticipated. The original study was quite complex because it was in three stages. It could also be said that it was ambitious to undertake a complex study in such a short time frame, dictated by the availability of the students and access to the resources. If the study were to be repeated with the same resource and time constraints it would have been simpler to leave out the first stage and carry out more observations and interviews. These tools provided a deeper insight into the issues and it was for this reason that a follow up study was decided upon.

There were considerable practical issues to overcome in terms of combining the role of part time researcher and full time educator especially as the research was being conducted during the run up to a subject review in the college. During the course of the study there was a considerable amount of additional work associated with the subject review that had not accounted for in the original plan and therefore adjustments were made to the timescale. Other adjustments to the methodology were made because it was important to ensure that the research did not impact upon the students' learning experience. The follow up study was extremely useful in identifying issues that were still valid and adding further texture to the data. The next chapter will present the data from each stage of the study.
Chapter Six Data Presentation

This chapter will present the data from all stages of the study. The study revealed six main themes, knowledge and skills, experience, strategies, confidence, attitudes and access. The data have been synthesised and displayed under these headings with sub-headings where appropriate and have been reduced and displayed in a variety of tables that illustrate these themes and sub-themes. Respondents’ replies to interview questions have been recorded verbatim including grammatical errors. The data from the follow up study were compared with the data from the main study. Areas of similarity and divergence have been identified.

Knowledge & Skills

The data from the observations was first organised into categories according to Gagné (1992). This process identified that the knowledge and skills required to conduct an effective search for fabrics on the Internet are complex and cross all of the five categories of learned capabilities and all levels of Intellectual skill from discrimination to problem solving. However in reflecting upon the data from the observations it became clear that it was not possible to produce the kind of linear Instructional Curriculum Map (ICM) for the activity that Gagné (1992) recommends. This was because so many of the factors were interdependent and there were many approaches that the students could take and still arrive at a successful outcome. The observations revealed that the process was holistic in nature and the pattern of connections between the various skills and knowledge was not fundamentally hierarchical. The data in Appendix 8 shows the skills and knowledge that are required. Using these data it was then possible to identify the skills and knowledge individual respondents did not have and to explore the effects this had on their ability to conduct an effective search. There were also several factors external to the learner that had an effect upon the process. These factors are identified in Table 6.1

Themes that arose from the data showed that there were several areas in which the respondents had knowledge gaps. These were knowledge of:

- Computers and the associated technical knowledge necessary to use them effectively.
- The Internet including, tools for searching and navigation
and sites of interest.
- Subject specific knowledge relating to fabric sourcing and textile terminology.

Table 6.1 Factors external to the learner that could have an impact upon their ability to conduct an effective search.

<table>
<thead>
<tr>
<th>Hardware Issues</th>
<th>Software Issues</th>
<th>Content Issues</th>
<th>Environmental Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to a computer on a regular basis</td>
<td>Stable network connections</td>
<td>File not found messages</td>
<td>Layout of the room did not encourage collaboration</td>
</tr>
<tr>
<td>Specification of equipment (memory, modem speed)</td>
<td>Browsers with appropriate plug ins</td>
<td>Sites that are more promotional than informative</td>
<td>Leaking roof interrupted a session</td>
</tr>
<tr>
<td>Access to printers</td>
<td>Contact details missing off sites</td>
<td></td>
<td>Double booking of rooms</td>
</tr>
<tr>
<td>Access to zip or other storage facilities</td>
<td>Advertising banners that are misleading and confusing</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cluttered Search engines pages</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Search engines accept different Boolean term</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Search engines offer different advanced search facilities</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Knowledge of Computers and associated technical skills

The observations indicated that some of the respondents lacked basic computer skills including in three cases how to control a mouse or use a keyboard. Throughout the observations the computers frequently crashed and Netscape performed “illegal operations”. Some of the respondents did not know how to escape from a crash others did not have basic file management skills or did not understand how to save and retrieve documents. Table 6.2 shows the categories identified in the observations.
This lack of technical awareness was confirmed by the interview data. In the interviews respondents expressed a desire to understand more about computers and the way in which they work. Some of the respondents felt that they did not know enough about how computers worked to feel confident in using them. Even the most experienced user felt that he needed to know more. More training was often seen as the solution to the problems along with increased access where this was an issue.

**Q. Do you think you’ve got enough knowledge of how a computer works?**
**A. No I think I could use more training.**

**Q. What sort of things would you like to be able to know what to do**
on the computer?
A. I would like to know a bit more about Word. I know the basic, but like for instance when we had to fill out that thing, the program detail we had to transfer it into word and I didn't have a clue how to do it. (sic)
(Respondent F)

Internet Knowledge
Coupled with a lack of technical knowledge about computers there was a lack of knowledge about the Internet, how it functioned and the tools available to help them to find appropriate information. Some of the respondents did not know how to use bookmarks even though this had been covered in the classes. Respondent M struggled with how to get into the computer network and how to send emails.

Q: Having done that [sent an email to a supplier] once would you feel confident to do it again?
A: I don't know. No I don't think so.
Q: And why would that be?
A: Because I wouldn't know how to get into the system.
(Respondent M)

Respondent (M) also had major problems with navigation and did not know how to use the back button to return to the previous page. Two respondents (S&J) did not understand how to use links to navigate. They also had problems with using Boolean logic to refine their searches and four of the respondents were unable to identify from the URL what kind of site they were linking to. Although they had been covered in the taught sessions none of the respondents went to a relevant gateway or the Library Ipage to start their search. All of the respondents went directly to a search engine that they usually used or one of the search engines that had been demonstrated in the class. Three respondents (Q, G &J) also had problems with creating folders and two (M&F) had difficulties sending an email.

Knowledge tended to be uneven with respondents having retained some relevant information or having discovered something for themselves.

Q: Do you use advanced search techniques?
A: I was trying to do it, but something went wrong, because you had
to put in some different letters. I couldn’t remember how to do it.
(Respondent F)

Only two of the respondents, H & D, seemed to have sufficient Internet knowledge to be able to use it confidently these respondents both owned their own computers.

Knowledge Gaps Textiles

The respondents used a very limited range of terminology in their searches. They were often unaware of trade names or companies that may have been useful keywords to use. They did not seem to be aware of textile trade associations or organisations that might have been good starting points for a search. This lack of awareness of resources was evident in the data from the Research Methods Activity which showed that Trade associations and CD ROMs were not used by 58% of the respondents; wholesale fabric suppliers and trade directories were not used by 44% of respondents (see appendix 5 for the full range of data from the Research Methods Activity).

The respondents did not seem to have planned in advance which keywords may be useful and tended to use generic terms such as fabrics and textiles. The range of keywords used in the searches is shown in Table 6.8. This table illustrates that most of the keywords used were generic in nature. The use of generic terms usually resulted in a large number of “hits”, many of which were not relevant to the type of information being sought.

Even when the respondents tried to refine the search, the terms being used were still usually not specific enough to generate a focused list of results. Two of the respondents (M&F) needed to be encouraged to send an email requesting fabrics because they did not know what to ask for. Respondent M had taken Advanced level textiles and therefore felt quite knowledgeable in this area. The other respondents felt that they did not have sufficient knowledge about textiles and that their knowledge was either basic or inadequate.
Table 6.3: Keywords used during observations

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Keywords used</th>
<th>Respondent</th>
<th>Keywords used</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>Debenhams</td>
<td>L</td>
<td>Fashion</td>
</tr>
<tr>
<td></td>
<td>Philip Treacy</td>
<td></td>
<td>Textiles</td>
</tr>
<tr>
<td></td>
<td>Accessories</td>
<td></td>
<td>Fashion textiles</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Woolblend</td>
</tr>
<tr>
<td>F</td>
<td>Courtaulds</td>
<td>M</td>
<td>Tartan</td>
</tr>
<tr>
<td></td>
<td>Fabrics</td>
<td></td>
<td>Tartan &amp; fabrics</td>
</tr>
<tr>
<td>G</td>
<td>Space</td>
<td>O</td>
<td>Textiles</td>
</tr>
<tr>
<td></td>
<td>Space fabrics</td>
<td></td>
<td>Technical fabrics</td>
</tr>
<tr>
<td></td>
<td>Waterproof fabrics</td>
<td></td>
<td>Organic textiles</td>
</tr>
<tr>
<td></td>
<td>Outdoor fabrics</td>
<td></td>
<td>Hessian</td>
</tr>
<tr>
<td></td>
<td>Goretx</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Goretx &amp; fabrics</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Goretx &amp; sales</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>Fabrics in London</td>
<td>Q</td>
<td>Neoprene</td>
</tr>
<tr>
<td></td>
<td>Fashion fabrics in London</td>
<td></td>
<td>Neoprene fabric</td>
</tr>
<tr>
<td></td>
<td>Fabric seller</td>
<td></td>
<td>Latex &amp; neoprene</td>
</tr>
<tr>
<td></td>
<td>Fabric merchandiser</td>
<td></td>
<td>Neoprene &amp; textiles</td>
</tr>
<tr>
<td></td>
<td>Fabric wholesaler</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>Tweed</td>
<td>S</td>
<td>Textiles</td>
</tr>
<tr>
<td></td>
<td>Fabric</td>
<td></td>
<td>Textiles &amp; UK</td>
</tr>
<tr>
<td></td>
<td>Textiles &amp; tweed</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Textiles &amp; wool</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>Textile</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wholesale fabrics</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 6.3 indicates that the respondents had limited access to the appropriate terminology, this is also illustrated by their responses to questions about the extent of their textile knowledge.

*Not a lot really. We don’t have a lot of textile lessons, we didn’t know a lot about fabrics, some people struggled with the final project. We want to use a lot of fabric, but we don’t know.* (Respondent G)

*I need a lot more, I just know the basics, to start the whole thing, but obviously if I had in depth knowledge, these problems would not have occurred, like if I had known the terms, and if I had exactly known the composition. I’m sure when I want wool they have loads of compositions, and if I had known the exact like 60% or 40% in something else it would have helped. If I don’t know that it takes a lot more time explaining things to people.* (Respondent H)
I don't feel that confident. I don't feel that I know enough about fabrics. I mean general fabrics, but I couldn't say that's got that and such and such. Some things I'm still not sure about. I don't feel very confident. (Respondent L)

This caused difficulties because they were uncertain of the terminology to enter as keywords when conducting a search. It also made some of them unconfident about communicating with suppliers and reluctant to send email requests for fabric swatches because they were unsure how to ask for them.

Some of the least confident users had knowledge gaps in all three areas. It is perhaps unsurprising that this connection exists for some of the users. In many learning theories it is accepted that learners need to build upon existing knowledge in order to be able to develop higher order problem solving and metacognitive skills. This is true of both the Instructional and constructivist approaches to the use of technology in learning and teaching. Without this basic level of knowledge the computer can become a barrier to the learning activity instead of a tool to facilitate it.

Experience

The data from the observations and the interviews showed that the students with the least experience were also the least confident and the least knowledgeable about computers and the Internet. However, experience in itself did not necessarily lead to either confidence or a more strategic approach to searching. A lack of experience was also closely linked to a lack of access. The issues relating to experience fell into two categories:

- Experience with computers and the Internet.
- Experience in dealing with wholesale suppliers.

Experience with computers and the Internet

It was clear from the observations that some of the respondents had very limited experience with computers and this was supported by the interview data. They either had no experience with computers prior to their college course or had not spent sufficient time on them to build skills and confidence. For some respondents the issues of access and experience are very closely linked.
If I had more access to it earlier in life, maybe I would be more used to using it. (Respondent F)

The levels of experience of the interviewees are indicated in table 6.4

Table 6.4: Experience of Using the Internet and related themes.

<table>
<thead>
<tr>
<th>Respondent</th>
<th>D</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>L</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Experienced</strong></td>
<td>Q How long have you had access to the Internet?</td>
<td>I’ve been using it almost 4 or 5 days a week [for over a year]</td>
<td>I had used it before but just for email</td>
<td></td>
<td>I did [use it] at work experience-I had a list of what to look at.</td>
<td></td>
</tr>
<tr>
<td><strong>Limited experience</strong></td>
<td></td>
<td>As I said I really haven’t used it that much.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Inexperienced</strong></td>
<td></td>
<td></td>
<td></td>
<td>It was the first time I’ve used it.... I haven’t been on it enough</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A lack of experience was often accompanied by a lack of technical knowledge. The ability of an individual to access the computer and spend time building confidence and gaining knowledge seems to be a key factor in their attitude to the media. The most experienced users with access to their own computers displayed the most positive attitudes, (Respondents H&D).
Experience in dealing with wholesale suppliers

The respondents experience in using wholesale suppliers prior to the project was very limited. Respondent L explained why she had not bothered to use wholesale suppliers.

*You just always think you're going to get the fabrics down the road. But I think you just think that when you're out. Then you have to do something like that, but you don't really think that you're going to need to while you're still studying, unless you want something really exotic, or you've actually been out of London or somewhere else and seen the fabric, so you specifically wanted that. You can always go here or there or they'll send you somewhere else that you can get the fabric.* (Respondent L)

Respondent F had never contacted a wholesale supplier prior to the project where this was set as a task. Whilst some respondents said that they had previously used a trade directory they did not necessarily use them consistently. Some were aware of and had used trade associations for information. The Textile Institute was cited by two respondents (L&D), but respondent F was not aware of its functions. This lack of understanding about the roles of trade associations and the information they are able to offer could account for the low percentage of students accessing and using them at all stages of the study.

Strategies

The respondents did not evidence a strategic approach to the way that they searched nor to information seeking generally. This was identified in the observations and supported by the interviews. There were a variety of strategies that the respondents employed for dealing with different aspects of the task. These have been broken down into strategies relating to searching, technical issues and issues relating to fabric sourcing.

Searching Strategies

Respondents employed a range of strategies to search the Internet and make choices about the sites to go to. These strategies varied in their effectiveness and in some cases the complete lack of knowledge about how the Internet works led students to employ ineffective strategies. This could be why they felt so overwhelmed with the amount of content on the Internet. The most confident and experienced respondents employed the most effective strategies.
If I put in fabrics in the UK, it gives me 35 answers, then I write raw silk fabrics in the UK, so it narrows down. (Respondent H)

Respondents tended to stick to between one and three search engines with which they were familiar, Yahoo was by far the most popular being cited by four of the respondents. Reasons given were that friends recommended it; they knew the address; it was easy to use and that they were familiar with it. This contrasted with the data from the observations, see table 6.5, where Alta Vista was the most popular search engine. However this could be explained by the fact that Alta Vista had been used in the taught sessions.

Table 6.5: Search engines used during the observations

<table>
<thead>
<tr>
<th></th>
<th>Q</th>
<th>K</th>
<th>G</th>
<th>L</th>
<th>M</th>
<th>S</th>
<th>D</th>
<th>J</th>
<th>F</th>
<th>H</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>Google</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lycos</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alta Vista</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yahoo</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Excite</td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The search engines with which the respondents were most familiar might not be the most effective for the type of search they were conducting. A lack of knowledge of, or willingness to experiment with different search engines, may be making their search strategies less effective than they could be. There was overall a lack of strategy in the respondents approach to searching and to their selection of tools for searching. This lack of a strategic approach was partly due to a lack of knowledge about gateways, directories, advanced search techniques, image searches and fashion and textile related sites on the Internet. One of the respondents (D) was very experienced and confident but still did not demonstrate a strategic approach or an extended knowledge of search engines, advanced search techniques or sites that may be useful indicating that experience with the Internet in itself does not necessarily lead to the use of effective search strategies.
Table 6.6 shows that the majority of respondents rely upon browsing strategies in order to conduct their searches. They are aware of some tools that can be of assistance Boolean operators for example, but are not always sure of how to use them (Respondent F). Finding appropriate keywords could be a problem and some of the respondents did not use scan reading techniques to evaluate the results of their search but read through everything. They had difficulty in remaining focused upon their task and felt that it was easy to get lost or spend an inordinate amount of time upon the task.

If you’re trying to find information and you think that it might be useful and just have a look and see what’s in that box or column and it leads you to something else, you think that’s quite interesting, I might print that, it just leads you to other things. (Respondent L)

Table: 6.6: Search strategies used and preferred search engines

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Search Strategies</th>
<th>Preferred Search Engines</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>Q: So how do you work out what is useful? A: Just visit and remember.</td>
<td>No preference stated</td>
</tr>
<tr>
<td></td>
<td>Q: Do you bookmark sites?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A: Yes</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>Normally they have writing underneath, I just read through and see if there is anything.</td>
<td>Yahoo &amp; Alta Vista</td>
</tr>
<tr>
<td>G</td>
<td>Normally I just go onto Yahoo, and if I find anything in there, I try and connect when I’m in there.</td>
<td>Yahoo</td>
</tr>
<tr>
<td>H</td>
<td>I read everything but very fast.-Once in a while, when I’m searching and things are not happening, I then start over again, and think what’s the best way of narrowing down things.</td>
<td>Yahoo Netscape, Lycos</td>
</tr>
<tr>
<td>L</td>
<td>It tells you the percentage of if it’s nearest to what you want, so I either read it or flick through what looks most relevant. Sometimes I just go to the site and see what kind of information they do and if it’s not appropriate then I’ll just go onto the next one.</td>
<td>Yahoo and Lycos</td>
</tr>
<tr>
<td>M</td>
<td>I’ll be looking for one particular thing so I just type that in</td>
<td>No preference stated</td>
</tr>
</tbody>
</table>

Some respondents did not question the accuracy of the information but felt that if a company put it up there it must be accurate. The most experienced
user said that he would use a member of staff to validate information he was unsure of. Other users felt that although the Internet was useful that a lot of the information was inaccurate or out of date.

**Strategies for dealing with technical issues**

Throughout the observations the respondents experienced technical problems. The computers crashed and Netscape would unexpectedly quit. Few of the respondents knew how to deal with these issues and this was reflected in their responses in the interviews as shown in table 6.7.

<table>
<thead>
<tr>
<th>Table 6.7: Strategies for dealing with technical problems</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Respondent</strong></td>
</tr>
<tr>
<td>D</td>
</tr>
<tr>
<td>F</td>
</tr>
<tr>
<td>G</td>
</tr>
<tr>
<td>H</td>
</tr>
<tr>
<td>L</td>
</tr>
<tr>
<td>M</td>
</tr>
</tbody>
</table>

Table 6.7 indicates that all of the respondents have experienced some problems of a technical nature. The strategies they employ to deal with this seem to be instinctive rather than based upon an understanding of the nature of the problem. Respondent H was familiar with some technical terminology and seemed to be aware that running several applications or having a lot of windows open may be part of the problem. Generally they felt ill equipped to deal with technical issues, one of the strategies they employed to deal with
this was to consult a friend or relative who was more knowledgeable. This collaborative approach to problem solving was also apparent in the taught sessions. Some of them felt that they needed more training or more IT classes to help them feel confident in their use of computers.

*It was just four lessons, there were a lot of people, I just think a few more, so you can really understand the scanning and things like that. Everyone was at different stages, so it was just trying to get onto it, and recalling everything that you've done. I felt that maybe if it there was another lesson, if you had wanted to go over something, it would have been quite useful.* (Respondent L)

**Fabric Sourcing strategies**

The RMA showed that the range of resources that students were using for fabric sourcing was limited and that they did not tend to use wholesale suppliers or trade directories and associations. The observations verified this, however by the interview stage (after the taught sessions) the majority of the respondents had tried to contact wholesale suppliers in order to get fabrics for their final major project. This was not always easy nor necessarily led to a successful outcome.

The strategies employed for sourcing fabrics for their final project included:

- Retail suppliers n=3
- Lists given by tutors n=3
- Contacting wholesalers by phone/letter n=5
- Internet for fabric research n=4
- Samples via Internet n=3
- Trade directory n=1

Of the five respondents who contacted wholesale suppliers, three had relied upon the list given to them by the textiles tutor. Some had success in getting samples but then found that they were unable to order small quantities. Three respondents reported an adverse reaction from companies when they said that they were students.

*Yes, a lot of problems. When I phoned them and said I was a student, they said oh no, three times or something like that, and then they send a sample. They had to ask my boss, with I'm working part time, give me her name and I ask them if they can give me samples to her,*
so I had to go and pick them up from there. (Respondent G)

To overcome this one student used a contact in the industry to get the samples for her, another pretended to be an established designer.

One of the most confident respondents, (H), was also the most experienced in using the Internet. He used the Internet for all his sourcing and obtained samples from five of the ten companies he contacted. He had a definite preference for this method of sourcing.

A. On the whole, they have the kind of fabrics they have on offer, so I click on them, and obviously, they have pictures, but I can't feel and see and then I write to them, I know that they have a number, so I quote that, and I say I've seen this on the internet and I was wondering if you could send me some.

Q. So the fact that you can see it is better than just ringing up, is it?

A. Yes, I think so, you get a visual with impact, which is a lot more than talking to someone on the phone, and if you like the colour and texture, you can get some idea, and then you say I've seen this can I have a bit. (Respondent H)

Respondent D who was also an experienced user stated a preference for using more traditional methods but was unable to articulate why this was the case.

Even though they did not all use the Internet to source their fabrics they saw the value of being introduced to wholesale suppliers and had found the sessions useful in helping them to develop their Internet skills although they felt that the number of sessions was not sufficient.

I thought it was good, because it also gave you confidence, to speak to other people and try and sound professional and knowing what you want and try and get that across to someone else. It was confidence building, especially speaking on the phone, and all over the country. Also trying not to sound stupid, or sound like you don't know what you're talking about, and getting someone else to take you seriously on the phone. I thought it was useful for that. (Respondent L)
Confidence

Respondents' levels of confidence when using the technology varied from extreme confidence to extreme anxiety. The data from the observations and interviews indicated that the least confident users were often those with little experience of using the Internet and limited access to it. There were many factors that seemed to have an impact upon levels of confidence. Some of the most confident respondents used the Internet for social purposes as well as work. It may be that social use has helped them to develop confidence or because they are confident in using the Internet that they use it socially. The answer to this lies outside of the scope of this study but there is evidence in the data that the more the student uses the Internet for whatever purpose that this helps them to become more confident.

From problems with spelling to severe dyslexia a lack of confidence in their literacy skills made students nervous and sometimes extremely anxious about using the web. Literacy issues affected some of the students for whom English was not a first language but not all of them. The level to which it affected them seemed to depend upon their level of ability in English and their ability to employ other resources to help them (dictionaries, English friends). Students for whom English was a first language also faced difficulties caused either by a lack of confidence in their use of spelling and grammar or in the case of respondent M, because of her dyslexia.

"The problem is I'm not very good with anything that's written down. I don't take in what I read. I think that's because I'm dyslexic, so I don't do a search by reading things." (Respondent M)

Table 6.8 shows that the respondents varied from extremely confident in their use of computers (Respondent D) to actively avoiding using them (Respondent M). The interview data confirmed the conclusions from the observations that Respondents D & H were the most experienced and confident users of the Internet. Both of these respondents have access to their own computers at home with an Internet connection. This may be a partial explanation for the fact that they are more confident than respondents who have less access and experience. Respondent M has a computer (but no Internet connection at home) and previous experience of using the Internet but is still not confident in it's use. However, as previously indicated this respondent is also severely dyslexic and feels that this has had an impact upon her confidence and the
way in which she uses the Internet.

Table 6.8: Levels of confidence as illustrated by the interview data.

<table>
<thead>
<tr>
<th>Very Confident</th>
<th>Confident</th>
<th>Party Confident</th>
<th>Unconfident</th>
<th>Very Unconfident</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Do you think you've got enough knowledge of how computers work to be able to use them effectively?</strong></td>
<td>I wouldn't say I'm an expert on it, but the things I use normally, I'm quite confident. (H)</td>
<td>I'm not confident enough about using them. I feel I need to go on it and use it. (L)</td>
<td>Q. You don't think you know enough about it to feel very confident? A. That's right (G)...</td>
<td>...even using the machines, it's like oh no! It's just a confidence thing. (M)</td>
</tr>
<tr>
<td>A Yes (D)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The least confident users G, L, and M seemed to be affected by a range of factors including, literacy, access, technical knowledge and subject knowledge. The impact of these factors varied according to how they combined for the individual and the degree to which the individual felt that it was a problem. For Respondent L her problems with spelling had a profound effect on her confidence in written communication.

*I have a problem with spelling. I know some things I can't spell, but sometimes I get more nervous when I think I have to write something*
for someone. Even if I could spell it normally, but the thought of having to type it, and them seeing my mistakes, makes me even more nervous, so I just write it and then type it afterwards. So I do have a problem with spelling, it’s not so much the words, but just the spelling, sometimes making sure it’s in the right grammatical order. (Respondent L)

Respondent G had difficulties with both language and her level of subject knowledge. She was reliant on her sister for access outside of college and support with technical issues. The problems caused by Respondent M’s dyslexia were compounded by a lack of access to the Internet at home. She was very anxious about using the college facilities.

The other problem I have, I know it sounds stupid, but it’s the idea of coming into college and using the computers in college, I don’t have access to email at home, not down here anyway, we do at home. It puts me off the thought of it. I don’t like coming into college, into the library to do it. (Respondent M)

Attitudes

Respondents’ attitudes toward the Internet varied from extremely positive to sceptical. Most of the respondents made a mixture of positive and negative comments that illustrate their attitudes toward the Internet, as shown in Table 6.9 Table 6.9 shows that Respondent H was confident, experienced and extremely enthusiastic whilst Respondent M felt that she had not used it enough to be able to identify any positive aspects.

Respondent L had positively tried to avoid computers although she was now making a conscious effort to try and engage with them because she saw the necessity of using them in her future career.

Even before the Internet, you had to know about computers. Before they would train you, but now they just expect you to know, up to a certain level. So you at least have to be at that level and be aware of all the things that are happening and what you can do with them. Because it changes every year, you do have to know, otherwise when you do go out into the industry or work, whatever you do, the computers are so integrated into everything that you’d just be
left out in the cold, and you would have to start learning it anyway. (Respondent L)

Table 6.9: Respondents' comments illustrating positive and negative attitudes toward the Internet.

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Positive</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>I think it is useful at times ... it can be very educational</td>
<td>I think it [internet] needs a lot of work because it's still quite basic, most websites are still quite basic.</td>
</tr>
<tr>
<td>F</td>
<td>It is up to date...you can find things out that maybe you can't find out in the library in books</td>
<td>What I dislike is you get so many things coming up</td>
</tr>
<tr>
<td>G</td>
<td>There is a lot of information in there</td>
<td>It takes a long time when I don't know [the right keyword]. It never comes up the way I want. Something I don't want comes up</td>
</tr>
<tr>
<td>H</td>
<td>I love the Internet. I haven't come across any negative side-you can get in touch with anybody instantly</td>
<td>Certain things.... they need to be updated; they haven't bothered to do it.</td>
</tr>
<tr>
<td>L</td>
<td>I think it's easier to find the information...it saves you having to go through loads of books or magazines and things</td>
<td>You have so many options on it. You can be there for hours looking through them</td>
</tr>
<tr>
<td>M</td>
<td></td>
<td>Everything is a struggle</td>
</tr>
</tbody>
</table>

The respondents recognised the role that computers and the Internet could play in research as well as in their future professional lives. However, they had reservations about the time it took to learn the appropriate skills and to find the information that they were looking for. Some of the respondents felt overwhelmed by the volume of information offered on the Internet and felt ill equipped to analyse and evaluate it. This was especially the case for some of the respondents for whom English was not a first language.

There is a lot of information in there, but it takes a long time to download that. Sometimes when I type, with English not being my first language, I don’t know how to say a short word to find something. It takes a long time when I don’t know. It never comes up
the way I want. Something I don’t want comes up (Respondent G)

The respondents also had an ambiguous attitude toward the content on the web they were aware of the lack of quality controls and the fact that anyone could put information on the web but most of them did not have well developed strategies for evaluating the information. One of the more experienced users Respondent D was critical of the quality of the information and the ways in which it was presented and promoted.

I think the quality web sites need to advertise themselves more, be more attractive and fun, because education should be fun. (Respondent D)

Access

Access to the technology and the resources to use it effectively had a clear impact upon the level of experience of the user. It was noted that generally the students who had no access outside of college were the least experienced users and were often the least confident. They also had the most limited knowledge of computers, the Internet and search tools.

Some of the respondents clearly felt that not having access at home to a computer with an Internet connection was a disadvantage. They were not always able to access a computer at college at a time that was convenient to them.

It’s mainly in the evening when the college is closed, when you are at home. That’s why you’re restricted. (Respondent F)

I don’t have access to email at home-I don’t like coming into college, into the library to do it. Someone’s always on it. (Respondent M)

Issues relating to access affect the respondents who do not have their own computer or have a computer but no Internet access. The two respondents (D&H) with their own computers and Internet access are able to spend a considerable amount of time each week surfing the WWW for social and work related information and activities. This level of access has enabled them to
build considerable confidence in using and accessing information from the
Internet. At the other end of the spectrum is Respondent F who felt that she has
been disadvantaged both by a lack of access to computers at an earlier stage
in her education and also by the fact that she now has no access outside of
college. It is evident that this respondent perceives access as being important
in enabling her to develop her skills.

Time was also a factor relating to access. The respondents with the most
limited access felt the pressures of time most acutely. Most commonly the
issue of time was linked with the amount of content that was available on the
Internet.

*It's not so much lost, but you can get lost in the search. You
sometimes think I'll just check in this and it just continues. You can
be on there for an hour or two hours, just looking for information. It
seems to go on for so long sometimes. You just go deeper and find
out more things, and one thing leads to another. (Respondent L)*

*What I dislike is the fact that you get so many things coming up,
and you have to spend so much time going through the whole thing,
but that's probably down to how specific you are. What I like is that
it's up to date, in terms that you can find things out that you maybe
can't find out in the library in books. (Respondent F)*

Five of the respondents felt that they needed more training or more class time
in order to be able to use computers effectively. They also wanted to be able
to spend more time on the Internet in order to become familiar with it. The
overall impression was that the respondents felt that they were under a great
deal of pressure when researching and did not have the time to consult all
the resources available to them or to use a resource with which they were not
familiar. They use their time very strategically but this can have the effect of
limiting the range of their research and the resources they use.

A lack of access obviously impacts upon their ability to gain this experience and
therefore they become trapped in a cycle where they cannot build confidence
because they are unable to gain more experience through a lack of access.
External factors

In addition to these skills and areas of knowledge there are certain external factors relating to the media that need to be addressed in order for the student to be successful. These external factors include access to a stable network and the appropriate software and hardware, the level of technical support that is available and the accessibility of the equipment at times that are convenient for the learners. The location of the facilities and the arrangement of the rooms to allow collaborative learning also need to be considered. One of the biggest external barriers was the attitude of suppliers toward students. The Internet provides an excellent medium for students to engage with experts and professionals but this opportunity for the textile industry to engage with and encourage the next generation of designers will be lost if they do not develop a more supportive response.

Relationships Between The Three Stages Of The Study

The relationships between the data in the three stages of the study were examined to ascertain where there was supporting data and where there were gaps. Appendix 10 shows at which stages of the study there were correlations within the data and that the majority of the issues identified in the observation data were confirmed by the interviews. The interviews also identified further issues that were not evident in the observation data for example the levels of anxiety that some of the respondents experienced when trying to use a computer. The issues explored within the first stage the Research Methods Activity were more limited and therefore there is less correlation between the data from this stage of the study and the observations and interviews. However, the interviews and observations did confirm that, as indicated in the Research Methods Activity, the students were not using and were not aware of the full range of resources that were available to them. They also had limited experience of using wholesale suppliers and professional resources such as trade directories.

The data from the main study reveal that the respondents were not using a strategic approach to their searching. They generally lacked confidence and experience in the use of computers and were not making use of functions that could speed up or simplify the search process for them. Most were not transferring or consulting information that had already been covered in the taught sessions or in other parts of the course. This meant that the majority of
the respondents were not working effectively and were taking much longer than necessary to find relevant information. These results are consistent with results from other studies that have examined the information seeking strategies of novice users of electronic information systems (Marchionini 1995).

The strategies that were used and seemed to be helpful were scan reading and in the case of respondent H the use of related resources that he had brought with him to help with the search. Some of the respondents had retained information from the taught sessions and tried to refine their searches using Boolean terms or book marked sites to come back to. The observations suggest that although the taught sessions were helpful to some of the students they were not in themselves sufficient to overcome the lack of experience of the majority of the students. It was also apparent that knowledge and experience of computers needed to be accompanied by well-developed information seeking skills. This need was also identified by (Lazonder 2000). Despite the problems they encountered more than half of the respondents managed to find some relevant information even during the limited time for which they were being observed. This would indicate that there is potential for the Internet to be a useful sourcing tool even though they were not using it as efficiently as they could be.

Follow up study
The follow up study was undertaken two years after the original study and its purpose was to identify whether the issues raised in the original study were still valid. The follow up study was felt to be necessary because it was recognised that the Internet develops at a phenomenal speed and there may well have been developments over this period of time.

Although much smaller in scale the follow up study still generated a rich tapestry of data that reinforces many of the findings of the original study. Because of the small scale of this element of the investigation there are necessarily some areas of the original data that are not represented. There were many convergences in the themes emerging from the data in the follow up study and a few areas where there were marked differences. The data are presented and discussed under the some headings as for the original study. Some new issues relating to the themes were identified. These included perceptions of authenticity of the activity, financial barriers. Two of the respondents were
almost totally dependent upon the Internet as their research tool.

Follow Up Study: Experience

The respondents varied widely in their levels of experience. The most inexperienced respondent (V) had very little opportunity to use computers before joining the course and had no close friends or relatives who could provide him with access to one outside of college. This respondent rarely used the Internet and faced all kinds of issues and problems relating to his lack of experience. This included an inability to access or use email. Respondent (W) was also fairly inexperienced and tended to rely upon support from family members. When this support from home became unavailable she faced major difficulties. Observation revealed that she had a very limited ability to use the Internet and did not know how to conduct a search relying instead upon typing in the URL for sites that she found in other resources. The two most experienced users had their own computers at home and tended to rely upon this resource rather than those provided by the college. They spent considerable amounts of time using the Internet but still did not have sophisticated information seeking and evaluation strategies in place. Their knowledge of search engines, Boolean terms and advanced search techniques was still very limited despite their experience. The level of use also related to an individual's level of experience. The two most experienced users also spent a lot of time each week on the Internet. They were able to do so because they owned their own computers.

The students who relied on the college facility were restricted in the amount of time they were allowed to spend on the Internet by the open access booking system. This connection between experience and levels of use, access and ownership of a computer was evident in the original study and has been reinforced and clarified by this stage of the research.

There does not seem to be a direct relationship between the level of experience and the speed with which a respondent is able to conduct a search. Respondent Z is the most experienced Internet user and yet does not seem to find what he is looking for any quicker than the least experienced.

Q: How long would you spend do you think looking for something before you got fed up?
A: Three hours, five hours.
Q: Do you do that often?
A: Yeah, I do because I usually get the visual from the Internet every time, sometimes it takes five hours to find the one pictures. (sic) (Respondent Z)

This is probably because despite his experience he had very limited knowledge of search techniques and subject terminology. He has come to rely upon the Internet as his research tool almost to the exclusion of other resources although he will use related resources to help him direct his searches.

Follow Up Study: Confidence

In the original study the most experienced respondents were also the most confident, this was also the case in the follow up study. This confidence seemed to be based upon familiarity with and access to the computer rather than an extensive technical knowledge. The less experienced users seemed to have a perception that using computers was difficult and complicated. Once shown how to send an email and perform some basic searches respondent (V) gained confidence and indicated that the whole process was much easier than he had feared. This would seem to indicate that experience coupled with support could reduce anxiety for individual users. Again the most confident users were those with access to their own computer that would seem to indicate that access and experience helps to build confidence.

Table: 6.10: Levels of confidence and access to computers & the Internet

<table>
<thead>
<tr>
<th>Respondent</th>
<th>V</th>
<th>Y</th>
<th>X</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of confidence</td>
<td>I'm not very confident to tell the truth</td>
<td>It wasn't very difficult actually</td>
<td>Actually I am not very good computer (sic)</td>
<td>I don't need to go anywhere just sit in my chair and just do everything</td>
</tr>
<tr>
<td>Access to computers /Internet</td>
<td>No access at home</td>
<td>Owns computer with Internet</td>
<td>No access at home</td>
<td>Owns computer with Internet</td>
</tr>
</tbody>
</table>

Other factors that affected confidence reflected those in the original study. These included literacy particularly searching in English for the two overseas respondents.
If I searching English sometimes I will not know what is called in English so I will need to try a wide, wide range like textiles, textiles company, stretch fabric. (Respondent Z)

Respondent X, also an overseas student, presented as unconfident in her use of computers. She also had problems with her English. This was mentioned in relation to her ability to use a search engine. Access was also an issue for this respondent. Respondent V was the least confident but he felt that if he knew more about how computers worked and had more access to them that this would help him to build confidence. When shown how to perform some basic tasks he immediately appeared to be more confident and positive. The most confident and experienced user was respondent Z.

Follow Up Study: Attitudes

All of the respondents recognised the value of the Internet as a professional research tool. The two respondents who did not own a computer expressed a desire to do so. Table 6.11 Shows that the attitudes of respondents toward the Internet were both positive and negative. It was generally seen as a useful research tool. Respondent Z felt that it offered an advantage in that the range of material available was much wider than that which was available from the library. However other users identified the range of materials as being problematic indicating that the time that it took to find something and the problems of navigating through the vast quantities of material were off-putting. Although a lack of confidence and experience did not necessarily mean that respondents had a negative view of computers and the Internet it could certainly make individuals feel more anxious about using them (Respondent V).
Table: 6.11: Respondents Attitudes towards the Internet

<table>
<thead>
<tr>
<th>V</th>
<th>X</th>
<th>Y</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>Q: What about the Internet? Do you think that would be useful to you when you go out to work?</td>
<td>Yes really useful because if they have so many company then try and call them (sic)</td>
<td>I think it is really useful actually. You do get the help that you find on the Internet, books, you do find a lot of resources</td>
</tr>
<tr>
<td></td>
<td>A: Oh yeah very like I said I need to learn a bit more get a bit more confident on there first</td>
<td>I spend a lot of time on the Internet if I want to see something because I have to look at everything</td>
<td>I spend quite long time actually (sic) an hour or two. It does take quite a long time to find what you really want</td>
</tr>
<tr>
<td>Negative</td>
<td>Q: Do you actually avoid using it? Does it make you anxious?</td>
<td>I spend quite long time actually (sic) an hour or two. It does take quite a long time to find what you really want</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A: A little bit yeah because you are not sure where you should be going –like going away from where you should be something like that.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Follow Up Study: Strategies
The approaches to searching used by the respondents relied almost entirely upon browsing strategies. Respondent X was not really able to conduct a search at all and relied upon entering the URLs of sites that she had found in directories or that had been given to her. The least experienced (Respondent V) was using a browsing strategy and had difficulty with refining his search and navigating through the web. Whilst some of the respondents used scan reading to evaluate the results of their search, respondent Y read through everything. Respondent Z took advantage of some of the advanced features
offered by search engines including language translation and auto correction of spelling. He was unaware of or not using several other features that would have helped him speed up his search. He was quite happy to spend five hours looking for one image considering this to be more convenient for him than other resources. This supports the findings of the original study in that experience with computers does not necessarily lead to good information seeking skills. Respondent Z relies heavily upon the Internet as his research tool but does recognise its limitations. When contacting suppliers he often resorted to letter or phone either because suppliers did not respond to his emails or because many of them did not have an Internet address.

Table 6.12: Search Strategies used by respondents

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Search Strategies</th>
<th>Search Engines</th>
</tr>
</thead>
<tbody>
<tr>
<td>V</td>
<td>That's what I do generally just browse around going back and forward till I find something I might be able to use from what I am looking at</td>
<td>I normally use this one: Lycos</td>
</tr>
<tr>
<td></td>
<td>Q: Is there a reason for that?</td>
<td>A: No it's just the one I normally go to</td>
</tr>
<tr>
<td></td>
<td>Q: Did someone tell you about it or did you find it?</td>
<td>A: Just found it. It's the first one I found</td>
</tr>
<tr>
<td>W</td>
<td>Probably I would look by myself, I try to look everything then this one is the right thing I am looking for then I just note it down. (sic)</td>
<td>Because at the beginning first come to the UK a friend of mine introduce me to Yahoo they say fast and more easy so that's why I use Yahoo. (sic)</td>
</tr>
<tr>
<td>Y</td>
<td>Well I read them fast see what they supply, what the company is. If it is the most popular one, sometimes, I normally see the Wolfins suppliers, these ones. So I probably go into these ones that I'm most familiar with.</td>
<td>Q: Is Yahoo what you usually use?</td>
</tr>
<tr>
<td></td>
<td>A: Mostly Yahoo yes</td>
<td>Q: Is there a reason for that?</td>
</tr>
<tr>
<td></td>
<td>A: I find it easier It's an easier engine research engine I just used that for ages sometimes I do use ask Jeeves it's quite good as well</td>
<td></td>
</tr>
<tr>
<td>Z</td>
<td>Always start with big range like textile company search fabric... Just First see the URL and if I can see the English one, but usually its dot com. (sic)</td>
<td>Because it [Google] is fastest search engine in the world the easiest one, it is the easiest one. (sic)</td>
</tr>
</tbody>
</table>

Table 6.12 shows that respondents were not selecting Search Engines for their appropriateness to the task but because they were familiar with them and felt more comfortable using them. Even when anchors and supports were provided in the form of help buttons and advanced search features the respondents
were either unaware of them or had not made use of them.

Respondent Z claimed that he used Google because it was the fastest and easiest but it is not known whether this is based upon experience of using other search engines or not.

Fabric Sourcing Strategies

More of the respondents reported using trade directories and trade magazines to locate suppliers than in the original study and some of them were using the Internet to contact suppliers. However, there were problems associated with this as many suppliers did not have a website or offer an email address. Some suppliers did not respond to emails. All of the respondents reported that they had a negative response to their student status and had developed a variety of solutions to the problem usually by pretending to be a practising designer or by using contacts within the industry. This mirrored the experience of the respondents in the original study.

I go to the list the college gave us last year then go to the web sites have a look and then sometimes I look at the textile book tell me where the website is then get the information (Respondent W)

Q: Would you normally have gone to a wholesale supplier?  
A: Umm well haven’t actually been but researching from the Internet would be the starting point. But, I would think of maybe going along to a wholesale fabric seller and seeing what they’ve got

Q: You haven’t done it before this project was set?  
A: No I haven’t actually. I haven’t done it before, this is my first time and I have had some replies back

Q: From the Internet?  
A: I emailed them and they sent me a reply back with a price list on there saying if you just tick the ones you want we can send you a swatch (Respondent Y)

Q: For this project where did you look for fabrics?  
A: We got some names and address and telephone numbers from the textiles lecturer so I’ve just been using that

Q: And how successful have you been so far?  
A: I haven’t had anything back yet. People on the phone normally
say if you just write us as letter we'll get back to you when we can. It's normally when you say you are a student they're not really that interested. (Respondent V)

Three of the respondents continued to use UK suppliers because of a perception that this would be easier. Even though they were being encouraged to engage in an authentic activity they felt that as it was just a college project that their student status prevented them from engaging in sourcing in the same way they would in the real world.

I think I would be probably looking for somewhere in England
Q: Why?
A: It would be easier for them to supply it. I'm only a student so in order for them to send it over it would be better if I was a designer or freelance designer. It would be actually much cheaper to import it from another country because it is just research at the moment. (Respondent Y)

The exception to this was Respondent X who was actually running her own business and had sophisticated strategies for sourcing from global suppliers calling upon friends who spoke other languages to assist her. This respondent had managed to form a relationship with individual suppliers based upon the fact that she was coming back to order fabrics for her business.

Technical problems
The network was more stable than in the previous study. However it was also on occasion very slow. Students also experienced dialogue boxes appearing informning them that they were unable to perform the operation and to contact the system administrator. Experience showed that if they closed this box they could carry on working. There were a couple of occasions on which the system crashed but certainly on a less regular basis than in the previous study.

Follow Up Study: Knowledge & Skills
As in the previous study, knowledge issues fell into three categories; subject knowledge, computer knowledge, and Internet knowledge. All of the respondents had knowledge gaps in all of the three areas. At the most extreme end of the scale was the respondent who had no idea how to send
an email. Other respondents had a more advanced knowledge of computers and the Internet but a very poor knowledge of the subject domain. Table 6.13 outlines some of the data and issues connected to knowledge gaps. Although none of the respondents mentioned a lack of fabric knowledge as being an issue, it was evident from their search strategies and the generic keywords used that their knowledge was fairly limited and that this affected the efficacy of their searches. A stronger grasp of the appropriate terminology would have enabled them to refine their searches and achieve more focused results. As in the original study the respondents used generic terms like “fabrics” and “textiles” and a very limited range of key words as evidenced in Table 6.14.

Table: 6.13: Issues relating to Knowledge

<table>
<thead>
<tr>
<th>Subject Knowledge</th>
<th>V</th>
<th>X</th>
<th>Y</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well I don’t know. I suppose if I was looking for a specific fabric like leather then I would put leather in obviously but I mean apart from putting the exact name of a material not really.</td>
<td>Because I want to know about winter textile, (sic) you know, fabric is easy for me to find. The summer fabric in Asia, silk something, I can get any silk very easily. I know how to get in Thailand and also Thai silk blends. I don’t know they [Winter fabrics] quite difficult for me (sic).</td>
<td>Well I guess I use wholesale fabrics that’s the way I would probably ask. I don’t know a shorter way.</td>
<td>Only just only Lycra. I usually search fabric and see this website</td>
<td></td>
</tr>
<tr>
<td>No I wouldn’t know how to send an email to tell you the truth</td>
<td>Some people are good computer, some people not very good computer (sic). For example I am not very good computer.</td>
<td>Q: Do you know how to refine a search? A: No</td>
<td>Q: Have you used the search tips or not? A: No I don’t</td>
<td></td>
</tr>
<tr>
<td>Q: Have you heard of Boolean terms? A: No</td>
<td>Q: Or advanced searching techniques? A: No</td>
<td>Q: Do you think they might be useful? A: I never tried this</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table: 6.14: Keywords used in the observations

<table>
<thead>
<tr>
<th>V</th>
<th>X</th>
<th>Y</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cashmere</td>
<td>Companies that sell wholesale fabrics</td>
<td>Textile</td>
</tr>
<tr>
<td>Fabrics</td>
<td>Wholesale fabrics companies</td>
<td>Pattern Stretch</td>
<td></td>
</tr>
<tr>
<td>Wool</td>
<td>Wholesale fabrics UK</td>
<td>Stretch fabric</td>
<td></td>
</tr>
<tr>
<td>Wool UK</td>
<td></td>
<td>Lycra</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sweat suiting</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stretch Suiting</td>
<td>Wholesalers</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sports wear wholesaler</td>
</tr>
</tbody>
</table>

Follow Up Study: Access

Access issues featured as strongly in this stage of the study as they had done previously. Access was identified as an issue by both of the respondents who did not own a computer. Respondent W identified the open access system as being inadequate for her needs. As discussed under the main themes a lack of access has an impact upon most of the other areas including, experience, confidence and knowledge. Respondent X cited financial difficulties that prevented her from buying a computer and the cost of Internet access through commercial outlets as being prohibitive because of the amount of time she needed to spend on a search.

_The cost is too expensive. For overseas student is too expensive, £5-£6K for course fees three years I have to pay for that._

_Q: So that means that you can't afford a computer?_

_A: Yeah I need a good computer so I don't want to buy secondhand computer. (sic) The good computer is £1-2 thousand something like that (Respondent X)_

Respondent V came from a social background where there was not a culture of computer ownership and use. As well as not owning a computer he also did not have access to the informal support network from which other respondents in both studies had benefited.
Time
Respondent X who did not own a computer felt that she could not spend sufficient time on the resources provided at college because it took her longer to find something than the booking system would allow. On the other hand, respondent Y who had her own computer could look things up at her leisure and felt that it saved her time to the point where she always used the Internet. All of the respondents mentioned the amount of time that it took to conduct a search and find relevant information on the Internet as an issue. Even the most experienced user complained that it took a long time to find something. The observations showed that none of the respondents were using efficient search strategies and therefore their ability to find relevant information was more a matter of luck than judgement. It is interesting to note that the perception of respondent Y is that searching the Internet can be both a time-consuming activity but over all she still feels that as a resource it saves her time.

Q: How long do you usually spend on the Internet?
A: I spend quite a long time actually an hour or two. It does take quite a long time to find what you really want.
Q: Do you think that the Internet saves time?
A: I think it does, Yeah because then I have an idea where to go and what to research.
Q: And have you used anything other than the Internet?
A: I just look at the Internet all the time
(Respondent Y)

Literacy

Literacy issues although not as clearly identified as in the original study are threaded throughout the data. The respondents continued to misspell words but some of the search engines had evolved to deal with this. Two of the respondents were overseas students for whom English was not a first language. However whilst Respondent X saw this as an obstacle the other more experienced user Respondent Z had developed strategies to deal with this using translation services.

I usually use Google because they have got Japanese. So I use that
(Respondent Z)

The Internet it seemed had adapted to address some of the issues faced by its users. Search engine developers had recognised that not all users were native English speakers and that some of them had problems with spelling.
Conclusions

The follow up study shows that very little had changed over the two years in terms of the respondents' abilities and levels of knowledge both of computers and textiles. However, as previously stated, the Internet had developed to take account of some of the problems that users were facing.

Table 6.15 illustrates the relationships between the original study and the follow up study. In the second study none of the respondents had problems with manual skills. They also did not experience the same difficulties with the hardware and the environment but this is most certainly due to the fact that the observations were undertaken in a room that was better equipped. They did still experience some problems with the computers crashing but generally the Network was more stable, if a bit slower. The latter is probably explained by the fact that the sessions took place at a site that was some distance from the main server and the network connections were not of the same speed as on the main site.

Table 6.15 shows the themes and sub themes that were identified in both studies and indicates where the data from the second study supported the conclusions drawn from the original study. External conditions like the environment, quality of equipment and the changes in the support systems were the major differences between the two studies. The issues relating to the learners and their levels of confidence, knowledge and experience were remarkably similar. Significant factors in both studies were:

- A lack of knowledge about computers, the Internet and the subject domain
- Issues relating to access and time available for using the Internet

These will be examined in more detail in the next chapter.
Table 6.15: Themes identified in the data in the original and follow-up studies

<table>
<thead>
<tr>
<th>Theme</th>
<th>Original Study</th>
<th>Follow-Up Study</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Attitudes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Content</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Authenticity</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Confidence</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Literacy</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Access</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Collaboration</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Anxiety</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Avoidance</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Support</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Experience</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Level Of Use</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Prior Experience</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Social Use</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Time</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Manual Skills</td>
<td>✓</td>
<td>O</td>
</tr>
<tr>
<td><strong>Knowledge</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer Knowledge</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Internet Knowledge</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Subject Knowledge</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Strategies</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Searching</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Evaluating</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Related Resources</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Contacting Suppliers</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Collaboration</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Validation</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Dealing With Student Status</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>External Factors</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hardware Issues</td>
<td>✓</td>
<td>O</td>
</tr>
</tbody>
</table>
Summary

This chapter has presented the data from all four stages of the study. The implications of the data and its relationship with the objectives of the study will be analysed and discussed in the next chapter, which will also explore the ways in which the study has contributed to knowledge within the fields of fashion education and use of the Internet as a research tool in teaching and learning.
Chapter 7 Analysis, Conclusions and Recommendations

This chapter will discuss the extent to which the study has answered the research questions. It will relate the findings to other related research in the field. It will also identify the areas in which it has brought forward new knowledge within the field. Recommendations for further research will be made and the strengths and weaknesses of this research study will be examined. Each of the research objectives will be revisited and the extent to which the study has met the objectives will be discussed.

1 To examine the ways in which students interact with the Internet/WWW

This study showed that the ways in which the students related to and interacted with the medium was dependent upon a wide range of factors. These include the students' levels of experience with computers in general and the Internet in particular. Responses to the medium ranged from extremely positive and enthusiastic to very anxious. Anxiety was a particular problem for those students whose lack of experience was exacerbated by another issue dyslexia, for example, or other problems with literacy. Williams (2002) points to the need for specific formatting of pages with regard to students with dyslexia and has identified this as an area worthy of further investigation.

The observations showed that the students faced a wide range of problems when trying to use the medium. Some of these problems were of a technical nature. The instability of the network was a particular issue and led to some students becoming very frustrated with the technology. There are other studies that have identified similar issues. Williams (2002) found that students complained about networking problems which restricted their access to their website. Technical problems were also cited as a barrier to learning using technology by Hara and Kling (1999) and Felix (2001).

Although these technical problems clearly affected some of the respondents the majority of the problems that they faced were due to gaps in their knowledge or a lack of effective information seeking and evaluation strategies. The sheer volume of information available on the WWW was seen as both an advantage and disadvantage and some of the respondents were clearly overwhelmed by the amount of data. This has been identified as an issue in other studies including Jeffries and Hussain (1998). The problems faced by novice users
undertaking research using electronic databases are well documented by Marchionini (1995). All but one of the respondents employed the browsing strategy that Marchionini (1995) identifies as typical of the novice learner. He claims that they take this approach because it does not require a great deal of advance preparation and because the novice probably lacks knowledge of the systems for refining a search and the tools that could assist them. Johnson et al (2001) found that “users relate efficiency to the amount of effort required from themselves to conduct a search.” (p. 45). Belew (2000) cites a study by Silverstein et al (1999) that showed that 78 percent of query sessions on Alta Vista involved only a single query and that the average session involved only two queries (Belew 2000, p 294). Boolean operators were used in only 20 percent of queries (Belew, 2000, p 293). The respondents in this study therefore, are not unusual in that they used simple queries and a limited range of keywords. The information seeking approaches of the respondents in the main and follow up study were examined and compared with the approaches of information experts, as defined in the relevant literature (Marchionini 1995; Abbott 1999). Four approaches were identified and the characteristics for each of these approaches are categorised in Table 7.1. The categories were drawn from the empirical data and the respondents were allocated to the category that most closely matched their search strategies.

Table 7.1 shows that seven of the ten respondents, from the main and follow up study, were not employing strategic approaches. Belew (2000) argues that “if the browsing user really knew the answer of their information need precisely, they wouldn’t be surfing” (p 315). This points to a need for the novice searcher to be assisted in identifying the precise nature of the information that needs to be found and a range of appropriate keywords. Guidance from librarians and information seeking experts on how to formulate appropriate search queries would help the students to become more efficient surfers and improve the speed and relevance of the search. This would enable them to move from novice to strategic analyst reflecting the theories of Lave and Wenger (1990) who advocate a learning model where the learner starts as a novice and through interaction with experts in their domain they move gradually toward the acquisition of expertise.
Table 7.1 Respondents' Information Seeking Characteristics When Using The Internet.

<table>
<thead>
<tr>
<th>Approach</th>
<th>Characteristics</th>
<th>Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analytical</td>
<td>Uses the full range of available tools and information sources</td>
<td>None of the</td>
</tr>
<tr>
<td>Strategist</td>
<td>Plans the search strategy</td>
<td>respondents</td>
</tr>
<tr>
<td></td>
<td>Refines and reformulates the query as necessary</td>
<td>in the main or</td>
</tr>
<tr>
<td></td>
<td>Utilises a range of search engines and gateways for their relevance to the task in hand</td>
<td>second study</td>
</tr>
<tr>
<td></td>
<td>Analyses and evaluates the information found</td>
<td>demonstrated</td>
</tr>
<tr>
<td></td>
<td>Stores and organises the information found for future reference</td>
<td>all of these</td>
</tr>
<tr>
<td></td>
<td></td>
<td>characteristics</td>
</tr>
<tr>
<td>Strategic</td>
<td>Mainly uses a browsing strategy but may use other resources to inform the search</td>
<td>H</td>
</tr>
<tr>
<td>Browser</td>
<td>Does not have a systematic plan</td>
<td>Z</td>
</tr>
<tr>
<td></td>
<td>Takes a heuristic approach</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td>Has some knowledge of the tools and resources available but does not use the full range</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Engages in some analysis and evaluation of the information</td>
<td></td>
</tr>
<tr>
<td></td>
<td>May refine and reformulate the query as required</td>
<td></td>
</tr>
<tr>
<td></td>
<td>May store some of the information for future reference</td>
<td></td>
</tr>
<tr>
<td>Non-strategic</td>
<td>Relies on a browsing strategy</td>
<td>L</td>
</tr>
<tr>
<td>Browser</td>
<td>Does not have systematic plan or well defined goal</td>
<td>G</td>
</tr>
<tr>
<td></td>
<td>May not refine and reformulate the query as required</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Uses a single or limited number of search engines with which they are familiar</td>
<td>F</td>
</tr>
<tr>
<td></td>
<td>May not utilise advance search tools or other resources to assist in the refinement of their search</td>
<td></td>
</tr>
<tr>
<td></td>
<td>May not engage in analysis and evaluation of the information found</td>
<td>Y</td>
</tr>
<tr>
<td></td>
<td>May not store and organise information for future reference</td>
<td></td>
</tr>
<tr>
<td>Novice</td>
<td>Has insufficient knowledge of computers to engage in an effective search</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td>May not have used the internet often enough to understand how to use it</td>
<td>X</td>
</tr>
</tbody>
</table>

Some of the respondents struggled with the most basic functions of the computer for example, controlling the mouse or using the keyboard. Others had difficulty in understanding how to navigate around the WWW using links and forward and back buttons. There were very few instances observed where the respondents made use of other tools that could have assisted them e.g. the history button, book marking facilities or advance search options. Even when they were aware of these facilities they had rarely considered using them,
preferring instead to wander deeper into a trail of links or keep returning to a list of hits from a search. The respondents seemed to lack the inquisitiveness to try something new. Sometimes this was the result of anxiety about getting lost or doing something that might make the computer crash. They preferred to stick to search engines they were familiar with and used these even when there were other resources to which they had been introduced that were specific to their subject domain.

This finding is reinforced by a recent study EDNER (2002) found that 62 percent of students searching for information used a search engine as their starting point and that "search engines are liked for their familiarity and because they had provided successful results on previous occasions" (online). Their knowledge of sites and organisations on the WWW that were specific to fashion and textiles was extremely limited and reflected their use of physical resources in the college library. The data from the RMA showed that students were most likely to seek information from magazines and least likely to use trade directories and wholesale sources. This was also true of their activities online. If they visited fashion and textile related sites it was more likely to be a magazine or trend based site than a commercial one.

This lack of familiarity with the WWW was often linked to a lack of experience and access particularly for those students who had very limited prior experience and did not have their own computer. However, it has to be noted that not even the most experienced users were using these functions to their full advantage. Experience with computers in itself it seems, does not necessarily lead to effective information seeking. This has also been noted by Lazonder (2000). Once they had found a site they had problems identifying the appropriate vocabulary for ordering fabric and were sometimes reluctant to contact suppliers by email because they had concerns about their written communication skills. A little knowledge of the technical aspects of computers and basic functions could remove some of the learners' anxieties. They also need to be taught how to utilise the support systems that are available, to be inducted into the basic strategies for information seeking, evaluation and validation and some of the accompanying literacy skills such as scan reading that are used by information experts. Phelps et al (2001) recognise the need for learners to be able to adapt to the continuing changes in software and that this requires capability with computers as opposed to competence in a specific programme or environment. This capability is achieved they say through hands on experience, regular
practice and reflection on the part of the learner. They claim that computer capability is "much more to do with an approach to learning and working than simply a set of technological skills." (Phelps et al. 2001, p. 483). However, this study shows that the learners saw further training and lessons as the answer to their problems rather than developing self efficacy. The study also shows that we cannot assume that learners are entering higher education with the appropriate skills to enable them to effectively use the Internet or other forms of information for independent learning.

2 To determine their levels of confidence and ability in using the Internet/WWW

The respondents' ability to use the Internet and WWW confidently and effectively seemed to be associated with their levels of usage and previous experience. The respondents who were the most confident and experienced were usually those who had access to a computer at home. Williams (2002) found that the students with access at home used the system more than those who did not. Certainly the respondents who did not have access at home often saw this as a barrier and felt disadvantaged. The facilities offered by the college were not meeting their needs. The students who relied upon the college facilities felt the pressure of time more acutely than those who could browse at leisure at home and were further restricted in terms of the times and locations where the facility was available to them. Much of the literature on the use of the Internet as a tool for learning talks of the flexibility of the medium as being one of its main advantages (Dewhurst et al. 2000; Wilson 2000; Felix 2001). Some of the respondents in this study were unable to benefit from this flexibility because of limited access.

Some of the students indicated that using technology made them anxious and it has been shown that this can have a negative impact upon learning (Hara and Kling 1999). Some of the respondents reported feelings of anxiety that were related to their literacy skills and this connection is also identified by Brosnan (1998). It would therefore be appropriate to provide adequate support for students with literacy problems to enable them to use the medium confidently. Hale and Moss (1999) found that there was an emotional factor to searching that shaped search sequences and could lead to the abandonment of a search for emotional rather than rational reasons. In this study it was also clear that the respondents' attitudes and emotions were a factor in their approach to using the medium. Some of the respondents actively avoided using it for reasons that
seemed to be emotional rather than rational (Respondent L). Others became very frustrated with the technical problems (Respondent M) or because their search strategies were ineffective and time consuming (Respondent G).

These students seemed to have slipped into a cycle of negative feelings toward the technology that were reinforced by their inability to use it effectively. This was often because of quite minor issues or knowledge gaps that could be easily rectified. These phenomena were identified by Hale and Moss (1999) who describe it as the "lowest event level" where simple errors that go uncorrected can have a profound effect upon the learner. Phelps (2001) found that expert learners were able to identify and reflect upon the "knowledge and skills they do or do not possess and use appropriate strategies to actively implement or acquire them" (p 483). In order to move from being novice to expert it seems that learners need to be encouraged to reflect upon their learning and to identify the gaps in their knowledge and skills for themselves (Schon 1987, Laurillard, 1993).

The three most confident users across the two studies were all male and had access to their own computers. This is not particularly surprising given the culture of communications technology, which is described by Gorard and Selwyn (1999) as "firmly young, white, middle-class and male" (online) and the overall under-representation of women within the field. Boys are also more likely to be familiar with computers through games that are predominantly male oriented. The only male in the sample who was not confident with the technology had no access to it outside of the college. It would seem that access rather than gender is the key issue in developing confidence. Arbaugh (2000) states that:

**Prior studies have shown that if a user owns a computer, gender differences in attitudes toward computers and self efficacy in using computers become negligible. (p 506)**

Respondent Y was the only female student in this study who owned a computer with Internet access and did not have other problems such as dyslexia. She seemed to have an equally positive attitude to the male computer owners. Overall the users with the easiest access and the most experience were the most confident users even if they were not necessarily any more efficient. This was true of both male and female respondents.
Devine (1997) also highlights the importance of access. Inadequate access he says is “arguably no better than no access at all” (online). It needs to be recognised that students in higher education with limited access to computers are going to be disadvantaged. Whilst it is unlikely that most institutions will ever be in a position to provide each student with their own personal computer, they do have a duty to ensure that they have a strategic approach to the integration of information technology that takes account of access issues.

A surprising development in the follow up study was the level to which the two respondents who owned computers with Internet access had become reliant upon this as their main source of information. They used the Internet even when it may not have been the most appropriate source of the information that they were seeking. It could take them much longer to find the information this way than it would have done using traditional resources. There is a danger that these internet dependent students will be narrowing rather than expanding their range of references through their use of the medium. It is important therefore that educators who are trying to develop students’ online research skills do not neglect to highlight their limitations and the value of using a variety of resources as appropriate.

3 To analyse the students ability to apply appropriate strategies for independent learning using the Internet

A clear theme that emerged from the data were that the respondents lacked a coherent and strategic approach to independent learning using the Internet. They stuck to resources with which they were familiar, often because they were under pressure and felt that they did not have the time to explore alternatives or develop new skills. They drew upon the support of others when possible and the respondents who had friends or family with computer skills often relied heavily upon this source of support.

The respondents often felt overwhelmed by the sheer volume of information that was available to them and did not have well-developed strategies for evaluating and synthesising it. Felix (2001) notes that the wealth of information offered by the Internet was seen by students as an advantage that the resource offered but also created the disadvantage of distraction; findings that were also reflected in this study. This explosion in information and its incumbent
issues has been noted by Abbott (1999) who suggests that what is required
is not access to yet more information but development of the skills of critical
analysis and synthesis. The respondents were aware that information on the
Internet could be of a dubious nature. However, they did not always know how
to assess and authenticate it. There is a clear need for novice users to be
given some instruction and guidance on how to use the WWW and the tools
that it offers because “unguided exploration is a highly inefficient approach to
learning to use software “(Lazonder 2000, p 326). They also need instruction
in how to evaluate the information that they find.

Dalgrano (2001) advocates the use of context sensitive pedagogical guidance
and cognitive tools to assist learners as they browse. These could be built
into an online environment that utilises both instructional and constructivist
principles to support the learner, by providing a structure yet still enabling
them to discover their own sources of information and construct their own
understanding of the subject. This provision of scaffolding to enable the
learner to move from the known to the unknown is consistent with Vygotsky’s
theory that he calls the zone of proximal development (Vygotsky 1978). This
zone is the area between what the learner is able to do alone and what they are
able to do with assistance. However, this study shows that merely providing
scaffolding in the form of search tools and help buttons does not guarantee
that the user will take advantage of them. They need to be introduced to them
in a structured way that highlights how these tools can reduce the amount of
effort involved in information seeking in a complex environment. Providing
active links within documents or online environments is one way of guiding
students to appropriate resources. EDNER (2002) stress the importance of
providing a context to these links in the form of a brief accurate description and
the need for regular checking and up-dating of this kind of facility.

4 To identify areas in which students have difficulty in using or applying
the technology and to propose strategies that may be useful in
overcoming these problems.

This study identified many areas where the respondents encountered
difficulties of both a technical and pedagogical nature.
Some commentators have argued that it is not the technology itself that we
should be researching but the pedagogy that is applied to it (Fetherston
2001). However, the technical barriers that are faced by students cannot
be overlooked. If technical problems prevent the user from engaging in the
learning activity then the issues of pedagogy become redundant. The first requirement of using technology within a teaching and learning activity has to be to provide reliable and consistent access and sufficient technical support. The technology needs to become invisible so that the learner is able to concentrate upon the task for which they are using it. This study shows that there are still many barriers to this situation and this is identified by other investigations into the use of technology in teaching and learning (Johnston and McCormack 1996). This study shows that the institution used for the research is still a long way from achieving this ideal. There are, however, some strategies that can be employed and encouraged in order to move closer to this goal.

One of the first barriers that students faced was in the form of their username and password. It was evident during the taught sessions and observations that students had a propensity to forget their username or password or to confuse their Intranet password with the one for the course website. A simple password protocol and an easy method for retrieving a lost password would alleviate these problems.

The students who were able to call upon the support of others used this as a device for overcoming their own lack of technical or computer knowledge. Internet based learning offers the potential for students to support each other as part of a constructivist learning environment using “approaches that encompass collaboration and build a sense of community” (Fetherston 2001, online) skills necessary so that they can confidently use information on the Web for learning purposes”. This he says “is not a new challenge but has been around as long as we have had information stored in permanent form.” (Fetherston 2001, online). A taught programme of information seeking skills that encourages the learner to reflect upon their individual strengths and weaknesses and to identify gaps in their knowledge would help them to overcome some of the difficulties they faced in dealing with the large quantities of information available on the net. This need is also identified by Hara and Kling (1999).

Fetherston (2001) advocates the development of a system that identifies sites that have quality information that correspond to the “veracity of what might be found in a university library” (online). There have been many attempts by librarians and information professionals to provide this type of resource and help students to validate the information that they find. This study shows that
even though these resources exist e.g. ADAM and the London Institute Ipage, the respondents were not using them or were not aware of them. So perhaps a strategy for better dissemination of information about the resources that already exist is needed before more are developed.

Many of the respondents faced issues that related to the predominantly text based nature of the Internet and web-based communication. Some had problems with spelling and lacked confidence in their grasp of the subject based terminology or their own literacy skills. This led to reluctance to communicate by email. Others were uncertain about how an email worked and did not know how to undertake basic actions like replying to an email or adding an attachment. These aspects of Internet use are covered in their induction to the network but it is clear from the results of this study that this input is insufficient for a considerable number of the respondents. This prevented them from getting the full benefit of the resources available to them.

The provision of supported open access sessions covering some of these basic skills would help the less confident and experienced students to overcome these barriers and would be of particular benefit to those students who did not have access to a computer outside of the college.

5 To propose strategies for the integration of the media with other traditional teaching methods.

This study identified that there were other traditional sources of information (directories, magazines and classnotes) that could be used in conjunction with the Internet to enable the students to develop independent research and sourcing skills. The respondents were not generally transferring and integrating skills from other areas of the programme and tutors delivering the programme were not using strategies that would encourage this integration. A good example of this was the list of suppliers provided by one of the tutors. Although several of the respondents used this as their main source of information no web addresses or sites of interest were listed. Trade magazines and trade directories that list suppliers can be a good source for quick reference but were used inconsistently and some respondents were happy to spend hours on the Internet seeking information that it may have been easier and quicker to find in these resources.

The students had been introduced to a wide range of terminology that was
relevant to their search through their textile technology and business studies classes. This study showed that they had not retained a large amount of this information or were not able to call upon to assist them with their search. It may therefore be useful to provide a glossary as a support tool. There are such glossaries available on the web but the students were either unaware of them or did not use them. Although the respondents had been introduced to some gateways and other web-based resources they did not automatically use these sites. It would seem that they need to be reminded of their existence through other methods e.g. on project briefs and in tutorials and workshops.

Within the college the majority of the computers are in specialist laboratories and only a few are situated within workshops. This creates a barrier to integration within the curriculum. The tutor who is delivering a textile technology workshop would not find it easy to break in the middle of a session to show the students an interesting site on the WWW. Likewise the student in a design class would not be able to log into a website and download an image of a print that they wanted to use in their collection. The marginalisation of computers has been identified by Crook (1994, p 15) as undermining their impact.

James (1997) suggests that the WWW should not be seen as an external resource but should be used as a "powerful teaching resource resident within our own academic institutions and under our control" (online). This could be achieved by developing an interface that guides the user to a selected range of online and traditional resources. This could be used as a starting point from which the learner can construct their own route through the information on offer and having become familiar with the subject area, can then become more independent in their investigation.

6 To apply the knowledge gained to the development of other resources that can be utilised by fashion students undertaking independent research.

In order to be able to undertake independent research the students need to have effective information seeking strategies and the ability to critically evaluate and synthesise the information that they find. There are already some guides on the web that present this sort of information (Schrock 1998) and these could be used in addition to workshops and tutorials to help students to develop and practice these skills.
It would appear from the results of this study that what is required is an integrated approach to the presentation of both web-based and traditional resources for fabric sourcing. This could involve the production of a printed guide to fabric sourcing which outlines all the available resources and the methods of accessing them. This could then be supplemented by a web based resource area within the course website that would provide an electronic version of the guide with links to “informational help” (Alessi and Trollop, 2001, p 77) in the form of useful sites, glossaries and textile dictionaries and a link to notes from their textile technology and business classes. The resource base could also contain examples of letters and emails requesting samples and information and a guide to the different terminology used by various countries. Students for whom English is not a first language may need to be guided towards search engines and textile dictionaries that offer language options. The learners would also need “procedural help” (Alessi and Trollop, 2001, p 77). This refers to assistance in using the resource in the form of tutorials, a help button or contextual rollovers.

As evidenced in the data provided by respondent M, the problems for dyslexic students are more complex. The on screen resource should be developed taking the needs of these students into account using fonts, colours and layouts that it is easier for them to deal with. The computer can offer some advantages for dyslexic students as identified in the information sheet produced by the British Educational Communications and Technology agency (BECTA 2001) these include:

- The ability for the user to experiment with a variety of fonts and colours to suit their preferences
- Evidence that learning touch typing and finger patterns on the computer can help to reinforce correct spelling
- Software and hardware that can help dyslexics to develop coping strategies including speech recognition software

Although this paper makes reference to the Internet it does not identify any specific issues or problems that dyslexic users face when trying to use it. The British Dyslexia Association (2002) identifies the Internet as a useful resource for dyslexics and offers advice on making websites user friendly for dyslexics. The Web Accessibility Initiative (2002) is developing a code of practice for accessible web design for people with a wide range of disabilities including
dyslexia. Microsoft (2002) list a range of assistive technologies to help people with cognitive or language difficulties to use their software including:

- Keyboard filters
- Speech recognition programs & speech synthesizers
- Touch screens

7 To identify whether the Internet is a useful resource for fabric sourcing.

This study identified that the Internet has a great deal of potential as a tool for fabric sourcing for both professional and student users. If this potential is to be fully achieved there are many barriers that need to be overcome. Some of these barriers are a direct consequence of the nature of the medium and the lack of structure that is inherent in an open environment of this kind. The sheer volume of information on offer can be overwhelming. Users and developers of search facilities need to develop the appropriate strategies for dealing with this. Language and literacy skills can be a barrier although support tools that enable users to overcome these problems are evolving.

One of the most interesting aspects of the follow up study was that it indicated that the designers of search engines were constantly modifying the services on offer in order to help users to overcome some of the more common problems that they encountered. These include improvements in spell checking services, phrase matching and the development and expansion of translation services see (Sullivan 2001) and (Google b. 2002). The size of search engine indexes is also constantly growing, for example in June 2000 Google indexed 250 million pages whereas by December 2001 it had indexed a record 1.5 billion documents. (Sullivan 2001). This has potential advantages and disadvantages. On one hand the search engine is more likely to include the information that a user is looking for especially when they are searching for an obscure term. Alternatively, when a user is using a broad or popular term it may generate more hits. For example a simple keyword search for wool conducted by the researcher on a series of search engines in January 2000 (Gaimster 2000) was repeated in July 2002 gave the following results
As the web is developing so is the number of potentially useful fashion and textile sites on the web. Some of these sites are becoming very sophisticated with glossaries and specific advanced search facilities (FabricPro.com 2002) and others have been developed as business to business models which whilst useful to the industry may not always be accessible to students or require a subscription e.g. Entexa Database (Entexa 2002). A Google search for textile related sites in May 2002 generated 1,580,000 hits, refining the search to textile manufacturers reduced the number of hits to 191,000 still a daunting result for the novice searcher who does not know how to refine their search.

Other barriers are related to access. The Internet is still usually accessed through a personal computer with a browser. The cost of this technology although reducing is still substantial. For a learner to develop the required skills the ideal situation would be for them to own their own computer. This would enable them to practice at a place and time that they find convenient. The reality is that most of the respondents in this study still do not have sufficient access to be able to develop the confidence and skills to use the Internet and WWW effectively.

The quality of information available on some of the sites also needs to be addressed. Even when the students were able to find a relevant site it was not always easy to find sufficient information to be able to order a product. Although some larger companies are becoming part of organised portals and networks that allow online ordering and transactions these are not usually available to student users. There are some smaller companies that are more accessible. Whaleys of Bradford (www.whaleys.com) is a good example of a supplier who deals in small minimum quantities and is hospitable to students. Although the Internet has been identified as a resource that enables students to access authentic materials (Fayter 1998) this access is becoming more restricted.

<table>
<thead>
<tr>
<th>Search Engine</th>
<th>Jan 2000</th>
<th>June 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alta Vista</td>
<td>368,835 hits</td>
<td>473,789</td>
</tr>
<tr>
<td>Lycos</td>
<td>945</td>
<td>3,431,234</td>
</tr>
<tr>
<td>Yahoo</td>
<td>485</td>
<td>348 websites</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24,000 shopping listings</td>
</tr>
<tr>
<td>Hotbot</td>
<td>399,600</td>
<td>Number of hits no longer given</td>
</tr>
<tr>
<td>Excite</td>
<td>40,530</td>
<td>Number of hits no longer given</td>
</tr>
</tbody>
</table>
The fashion and textile industry needs to recognise that if it wants graduates with good sourcing skills then it needs to support students who are trying to develop these skills. This could be achieved by giving them guest access to some of the bigger commercial sites so that they can learn about the latest developments in textiles and the companies who manufacture them, even if they are not able to order them. Apparelkey (2002) and WGSN (WGSN) offer a student log in service. In the case of Apparelkey this gives them access to a limited range of information and WGSN offers them a specific time delayed version of their commercial site.

How this study has contributed new knowledge to the field
An investigation of the existing literature in the field has shown that whilst there are a great many papers on the use of technology in education there is a lack of the voice of the learner within these papers. Many of the papers cover computer mediated communication or the use of technology for the delivery of online courses and "are more anecdotal than systematically empirical or critical" (Hara and Kling 1999). There is a limited amount of information about how students use the Internet for independent study and as a resource for research. This study has identified that many of the issues faced by the respondents are not unique and are applicable to learners in higher education in general and this conclusion is supported by the findings of other investigations into the online searching behaviours of students (Johnson, Griffiths et al. 2001; EDNER 2002). These issues include:

- technical problems
- a lack of knowledge about the functions of computers and the Internet
- a lack of information seeking and analytical skills
- a lack of domain specific knowledge and vocabulary.

This study has added a further dimension to the understanding of the impact of the use of technology upon the individual. The nature and strength of this impact are dependent upon a complex set of factors that are defined by circumstances and experience of the individual. These factors include:

- access
- confidence
- literacy skills
• knowledge of the subject domain
• attitudes toward the media

Educators who wish to use technology within their programmes need to be mindful of these issues if they are to avoid a situation where a substantial number of their students feel disadvantaged or reject technology because they do not have the necessary support and access to be able to use it effectively. This study has also highlighted some issues that are specific to fashion students. The use of different terminology across an industry that is becoming increasingly global can be confusing. The reaction of the experts and professionals in the field to requests for information from students was often negative and deterred students who were unconfident from seeking information from these sources. Amongst the respondents there was an overall lack of knowledge about fabrics and commercial suppliers that needs to be addressed.

The respondents were also unaware of, or not making use of, other resources that could have supported them and made the location of appropriate information easier. The use of the Internet as a communication and promotional tool by the textile and fashion industry is still in the developmental stages. As one of the respondents indicated many of the companies he wished to contact did not have a web presence. This situation is changing helped by initiatives from the DTI e.g. UK online for business www.ukonlineforbusiness.gov.uk and textile organisations like the Textile Institute www.texi.org. These initiatives are being driven by the move within the Industry to use technology to meet the demands of the supply chain (Colussy 2000).

This study has identified a range of prerequisites that need to be met in order for fashion students to be able to use the WWW as an effective sourcing tool. The need for students to have these skills will become more imperative as more of the industry moves online. Educators in fashion and textiles can use this information to ensure that their students are equipped with the skills that employers will require.

There have been many attempts to define a pedagogy that should underpin the use of technology in learning and teaching and unsurprisingly consensus in this as in any other area of teaching and learning theory has yet to be reached. (Alessi and Trollop, 2001). This study has identified that the Internet
is a complex medium and its effective use as a research tool in teaching and learning requires that the tutor have a broad understanding of the range of teaching and learning theories that can be drawn upon to support the design of specific activities. There does not seem to be an individual theory that can be applied in all circumstances, rather there may be elements from several theories that can be drawn together to create the appropriate support for an individual or group of learners. The instructional and constructivist theories of teaching and learning both have something of value to offer. In the design of Internet based research activities it is the matching of the desired learning outcome with the appropriate teaching method that will ensure that the learner benefits from the activity. Table 7.3 shows a range of learning theories and how they relate to the findings of this study. The table shows that the tutor needs to be aware of a range of pedagogical approaches each of which can be utilised in the development of Internet Based Learning.

**Recommendations**

This study has identified a range of areas that are worthy of further investigation. These are:

- The design of Web resources that meet the specific needs of dyslexic students and those with other literacy issues
- The specific needs of non-English speaking students using the web
- The identification of processes for helping students to develop effective information seeking strategies
- Identification of the reasons why novice researchers do not use the support tools that are available
- The identification of effective methodologies for the integration of traditional and electronic resources
- Identification of effective strategies to promote the transfer of knowledge and skills from one context to another

There is a need for further research in greater depth that focuses upon the experience of the learner when applying and integrating new technology within specific areas of teaching and learning. More of that which is written about the role of technology in teaching and learning needs to be based upon empirical evidence. It seems that many of the issues that have been raised in
this study are identified within the literature. These include the identification of the situational and attitudinal barriers that exist but there has been insufficient testing of the possible solutions to these issues. This is possibly because much of the debate is still centred on the technology itself rather than its appropriate application.

Whilst search engines have evolved to become “fast, robust, scalable, sustainable and use a variety of techniques derived from 30 years of research in IR to achieve their performance” (Johnson, Griffiths et al. 2001, p 2) Johnson et al also note that “search engine developers may be approaching a fundamental limit in terms of the capabilities of their systems.” (p 3). Ultimately the effectiveness of online searching will depend upon an individual user’s ability to formulate an effective query and their willingness to “expend effort in narrowing a search.” (Johnson, Griffiths et al. 2001, p 4). Students will need to develop the ability to “gather, organize and critique information in order to learn” (Ehrmann 1999, online) in an increasingly complex and information rich environment. The challenge for higher education will be in finding effective ways of enabling learners to develop these skills.

Analysis of the data shows that whilst the Internet offers opportunities and has potential to be a useful tool for fabric sourcing there can be many barriers that prevent individual users from benefiting from the resource. For any given individual these factors, the combinations in which they appear and the profoundness of their affect can vary. Whilst it is not possible from this type of study to demonstrate statistical correlations between individual themes in the data, it is possible to draw up a list of factors that appear to enable users to be more effective in their searching. These have been summarised as in the following list.

Access to:
- Reliable equipment and infrastructure
- Peer support
- Technical support

Knowledge of:
- Directories and gateways
- Basic terminology and fabric types and constructions
- Subject specific vocabulary
- Basic functions of the computer
• How the Internet works
• A range of search engines and their particular strengths
• How to refine a search and use Boolean Logic

Strategies
• Using other methods and resources to support the search
• Calling upon friends and others to help when faced with problems
• Employing a range of search strategies
• Planning the search and identifying a range of appropriate keywords
• Using anchors and support tools to aid the search
• Remaining focused upon the task in hand
• Willingness to change strategies and use an experimental approach to problem solving
• Ability to scan and evaluate search results effectively
• Using a range of sources of information as appropriate

Confidence to:
• Use email as a means of communication
• Communicate using the written word
• Take an investigative and experimental approach to using the Internet
• Communicate with professionals in the subject domain

Attitudes
• A positive attitude towards the potential of the technology
• The motivation to undertake self directed study and practice
• The motivation to gain new skills and explore new resources
• Understanding of the relationship between the activity and the real world

Experience in:
• Using computers and the Internet
• Dealing with suppliers
• Communicating via email
• Using a range of resources for research
• Using a range of information seeking strategies
• Dealing with technical problems
• Using support systems and tools
• Evaluating and validating information from a variety of sources
The student who is able to bring together all of these factors should obtain a more consistent and faster result when trying to source fabrics on the Internet. It is possible to find useful information "accidentally" but this can take longer than using traditional resources such as trade directories if the user does not have a clearly defined search strategy. It is easier to be side tracked on the Internet and to get lost or be overwhelmed by huge quantities of information much of which may not be useful. The data show that the Internet is a complex environment that it is difficult for novice users to access and utilise efficiently and that in order to do so they need to employ higher order cognitive skills. This complexity and the associated difficulties have been identified by other studies in the field including Lazonder (2000). These complexities are illustrated in Fig 7.1

Strengths and weaknesses of the research
This study generated valuable insights into the issues and problems faced by students attempting to use the Internet and WWW as a research tool. The strength of this study lies in the opportunity it presents to hear the authentic voice of the learners. The variety of methods used enabled the researcher to gain a more holistic picture of the issues than would have been possible using a single research tool. The follow up study was especially useful in that it validated the findings of the original study and also highlighted the issues that were still not addressed. Although the study was small scale many of the themes that arose are reflected in other studies with student bodies working in various other disciplines. (Jeffries and Hussain 1998; Hale and Moss 1999; Arbaugh 2000; Lazonder 2000).

The study was conducted by a lone researcher and within fairly tight restrictions in terms of the resources available. The researcher has been aware at all stages of the study of the potential for bias in this kind of research and has therefore ensured that the data were carefully examined and the themes that were identified were supported by the data. Samples of the data were also analysed by a colleague. The use of multiple researchers would allow for further cross checking of the data and strengthen the reliability of the study.

The timescale of this study was dictated by the availability of the respondents
and there was not always as much time available for the analysis of the data between each stage of the study as the researcher would have liked. On the other hand this did mean that the data were fresh in the mind of the researcher as it was analysed and that the whole process was dynamic. The timescale was ambitious and it proved not to be possible to pilot at least one stage of the study. This stage, the observations, proved to be quite complex. However, a more satisfactory solution was found that proved to be more effective than the intended method of note taking. Further reading of the literature showed that this method of "talking aloud" was in fact a widely used and successful methodology for the evaluation of computer based learning and had been used very successfully in at least one other study focusing upon student use of the internet (Hale and Moss 1999).

The size of the sample was small, which meant that there were some issues relating to an individual that may have been identified as relevant to a larger number of respondents in a larger scale study. The student who reported as dyslexic is a case in point. The researcher was aware that there were many other students on the course with these difficulties and there may be other aspects to this issue that are not covered in the study. Given that the sample was small the study generated an incredibly rich and diverse set of issues and themes that may have been missed in a larger study with a narrower remit. This is one of the particular strengths of a qualitative approach.

This study provided data that answered all of the objectives of the study to some degree although in answering these objectives further questions were raised for which the data from the study was not able to provide the answers. These were identified as areas worthy of further research.

It is the intention of the researcher to apply the knowledge gained from this study to her teaching practice and in particular to the development of an online resource base for students to support them in the task of fabric sourcing. The evaluation of this resource will form the basis for further investigation into the area. A fast prototype of the resource has been developed see Appendix 13 and the researcher hopes to gain the funding to build the full resource.
Table 7.3 Pedagogical Theories and their relationship to this study

<table>
<thead>
<tr>
<th>Theory</th>
<th>Example Texts</th>
<th>Relevance to the Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Situated Cognition</td>
<td>(Bruner 1986; Bruner 1990)</td>
<td>Learners need access to computers and the time in which to explore the Internet. The context of the activity should relate to their needs and give them the opportunity for exploration and to build upon their existing knowledge.</td>
</tr>
<tr>
<td>Experiential Learning</td>
<td>(Rogers and Freiberg 1994)</td>
<td>Learners need to feel confident with the technology, have technical support and subject knowledge. They need the opportunity to practice their skills and apply their knowledge.</td>
</tr>
<tr>
<td>Social Development Theory</td>
<td>(Vygotsky 1962; Vygotsky 1978)</td>
<td>Collaboration with others and social use of computers can help to build confidence. Prior experience can enable students to engage more confidently in the task. They require scaffolding and support in order to be able to move forward from what they know to what they don't know.</td>
</tr>
<tr>
<td>Zone of Proximal Development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Situated Learning &amp; Cognitive Apprenticeship</td>
<td>(Brown, Collins et al. 1989; Lave and Wenger 1991)</td>
<td>Learners see the need for IT skills and how they would be useful in their future careers. Collaboration with others is used as a support strategy. Cognitive tools are acquired and applied within the subject domain.</td>
</tr>
<tr>
<td>Anchored Instruction</td>
<td>(Bransford 1990; CTGV 1990; CTGV 1993)</td>
<td>The activity needs to be relevant to the learners' needs and the problem set is realistic and set within an authentic context.</td>
</tr>
<tr>
<td>Cognitive Flexibility Theory</td>
<td>(Spiro, Coulson et al. 1988; Spiro, Feltovich et al. 1992)</td>
<td>The respondents needed to be able to draw upon a range of prior knowledge and skills and apply them in a different and complex environment.</td>
</tr>
<tr>
<td>Instructional Technology</td>
<td>(Gagne 1985; Gagne, Briggs et al. 1992)</td>
<td>External factors like unreliable connections and the poor content of some of the websites has an impact upon respondents' attitudes. Learners require basic technical and subject knowledge upon which to build in order to apply appropriate strategies. Using the internet encompasses a range of learning outcomes that require different types of skills and performance usually built from lower to higher order skills.</td>
</tr>
<tr>
<td>Genetic epistemology</td>
<td>(Piaget 1970; Piaget 1972)</td>
<td>Experience with computers and the knowledge of appropriate strategies helps to build confidence. Using the Internet requires the active engagement of the user. They need to be able to apply and adapt their existing intellectual and cognitive skills to develop appropriate strategies.</td>
</tr>
<tr>
<td>Reflective practice</td>
<td>(Schon.D.A. 1987; Laurillard 1993)</td>
<td>The learner needs to reflect upon the knowledge and skills that they possess and identify those that they need to acquire.</td>
</tr>
</tbody>
</table>
Fig 7.1 Diagram illustrating the relationships between the main themes of the study.
<table>
<thead>
<tr>
<th>Themes from the study</th>
<th>Links in the literature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dyslexia and literacy skills</td>
<td>Williams 2002, Brosnan 1998, Hale and Moss 1999</td>
</tr>
<tr>
<td>Information overload</td>
<td>Jeffries and Hussain 1998, Abbott 1999</td>
</tr>
<tr>
<td>Novice users lack a strategic approach to searching</td>
<td>Marchioni 1995, Belew 2000</td>
</tr>
<tr>
<td>Novice users use a limited range of search engines</td>
<td>EDNER 2002</td>
</tr>
<tr>
<td>Good computer skills do not equate to good information seeking skills</td>
<td>Lazander 2000</td>
</tr>
<tr>
<td>Anxiety and technophobia</td>
<td>Hara and Kling 1999, Brosnan 1998</td>
</tr>
<tr>
<td>Need for reflection on the part of the learner</td>
<td>Phelps 2001, Laurillard 1993</td>
</tr>
<tr>
<td>Gender is less important than computer ownership</td>
<td>Arbaugh 2000</td>
</tr>
<tr>
<td>Easy to get distracted if not using a strategic approach</td>
<td>Felix 2001, Selwyn et al. 2000</td>
</tr>
<tr>
<td>Collaboration is a useful strategy</td>
<td>Fetherston 2001, Crawford 1999, Benson Soong et al 2001</td>
</tr>
<tr>
<td>Need to integrate computers into the main curriculum and studios so they can be used in context</td>
<td>Crook 1994, James 1997, Comu 1995, Hunter 1999</td>
</tr>
<tr>
<td>Search engine designers are adapting the web to meet the needs of learners</td>
<td>Sullivan 2001, Johnson et al. 2001</td>
</tr>
<tr>
<td>The Internet is a complex environment requiring the user to employ higher order cognitive skills in order to use it effectively</td>
<td>Lazander 2000, Burbles 1998, Phelps et al 2001</td>
</tr>
<tr>
<td>Experience with computers can lead to confidence and a positive attitude</td>
<td>Wilson 2000, Dewhurst et al. 2000</td>
</tr>
</tbody>
</table>
Appendix 1: Assignment Brief

**BTEC HND FASHION DESIGN AND TECHNOLOGY**

Year 2 Groups 1:2:3:4

Project: Project 1 Transcending Tradition

Sub-division: Professional Studies B. Part I (Research)

- To demonstrate the ability to respond effectively to a range of different briefs.
- To demonstrate the ability to manage the design process from 2D Designing to 3D prototype and vice versa with professional ease.
- To demonstrate specialist technical knowledge and skills.
- To demonstrate skills of self-assessment and evaluation.

Learning outcomes:
At the end of the subdivision you will be able to:

- Source fabrics/materials from wholesale sources
- Identify a range of processes/techniques used in the production of
- Integrate design, technical development, sourcing and business skills in order to produce an appropriate solution to the brief.
- Use professional communication skills: written, oral, visual and IT.
- Conduct independent research
- Analyse and make comparisons between the selected markets/retail outlets.
- Integrate design skills, technical development skills and market knowledge in the production of a garment/product to the appropriate standard.

Introduction

This project is in two parts, part 1 is visual research, part 2 is development and realisation and will involve fabric sourcing and the production of a shop report.

You will be developing a range of co-ordinated garments (to include outerwear) or accessories for each of the given concepts. Outerwear in this context is a lined jacket or coat. Accessory students will be designing bags, shoes or hats depending on their area of specialism.

Each range should be developed for a different market and this should be clearly reflected in your solution to the brief including your choice of fabric/material. You may design for men and or women. You may design for any season between Spring 2000 and Spring 2001, including trans-seasonal.

You will develop each concept to produce 3 clearly defined projects in your portfolio

This project will involve the integration of design, technical development skills, textile technology and business studies. Part 1 is visual research which you are expected to conduct independently during the summer vacation. The second part of the project will be briefed at the critique
session on Thursday October 7th.

The concepts
**Explorations:** A look inspired by the intrepid spirit of explorers, from Captain Scott & Edmund Hilary to cosmonauts. Protection from the elements and survival in a hostile environment. Traditional and technological developments are mixed to create a fusion between the past and the future.

**Textures/fabrics:** water resistant, breathable, performance fabrics, brushed finishes, coated fabrics, and leather. 3D surface effects crackle finish, creased surfaces.

**Tailored to perfection:** Old values meet new cufing. Traditional detailing transferred to a new silhouette. Traditional styling gets a makeover in time for the new millennium. **Textures/fabrics:** matt finish, worsteds, flannels, smooth finishes, fine stripes, melanges.

**Down to earth:** A celebration of the natural environment and our relationship with the land. From peasant style to country sports the feeling is rural and uncomplicated. Country tweeds for urban living. **Textures/fabrics:** hairy, coarse finishes, speckled and multi-coloured tweed look, irregular surface effects, felts, surfaces are brushed and raised.

**The Brief**
For each of the concepts listed you are required to produce sketchbook and moodboard showing initial visual inspiration and market level.

At least 50% of your sketchbooks must consist of exploratory drawings, experimentation in fabric, notes and your own photographs.

All of the above is to be presented at the critique on Thursday 7th October.

**Assessment requirements**
**Pattern Cutter/ Textiles for Fashion/Accessories**
- Moodboard & Sketchbook for each concept, (completed in part 1)
- 4 development sheets for each concept. (Total 12 sheets).
- 4 presentation sheets & 1 range board (for the selected concept only.)
- Garment/product with appropriate technical information, patterns, working
- Drawing and a costing produced on the CAD/CAM system.
- Comparative shop report for chosen retail outlets. (Minimum 500, maximum 1,000 of your OWN words on each of the retailers) see separate sheet on shop report format.
- Rationale for the selected range (200 words).
• Fabric/materials board with a minimum of 4 fabrics/materials and accompanying information sheets.
• A folder containing evidence of fabric sourcing (letters, faxes, business cards, e-mails etc.)

Assessment Criteria:

An exceptional standard of work throughout, which follows a well thought through progression of ideas from visual research to garment/product construction indicating a strong personal direction and commitment demonstrated by a large body of investigative work through sketchbooks and sampling linking all areas of the course. The student will demonstrate a high degree of technical expertise sensitivity to colour and fabric properties with an imaginative design showing comprehension of fashion directions and market levels. The presentation will exhibit balance, sensitivity and skill in all areas of work.

MERIT
A high general standard of work, showing comprehensive research and progression to product construction. A good amount of inquiry shown in samples, fabrics and sketchbooks. A good grasp of technical matters with strong awareness of colour and fabric properties. Design will be sympathetic to the samples produced and backed by a sound rationale and market research. Presentation should be clean, careful and well thought through.

PAss
A satisfactory standard of work in all areas. A progression of study from research to finished product with technical and market information covered and sketchbooks showing the investigation of ideas. The execution of the design should be logical and carried out to a satisfactory standard. Presentation should be consistent and clean.
<table>
<thead>
<tr>
<th>Fabric/Materials Information</th>
<th>Student:</th>
<th>Group:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Supplier:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fabric/ material Type / Description</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fabric Width</td>
<td></td>
<td></td>
</tr>
<tr>
<td>cm/sq ft</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Swatch:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Woven:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>per linear metre</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knitted:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>per square metre</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost per Metre</td>
<td></td>
<td></td>
</tr>
<tr>
<td>kilo/sq ft/skin</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fibre Content</strong> eg. 50% wool 50% acrylic or 100% leather</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Yarns Type / Spinning Method:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fabric Structure:</strong> e.g. Type of Weave or Knit or Lace, etc. or material type</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dyeing Stage / Description:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Print Type / Technique:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Finish Type / Method:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Other Information</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Appendix 2: Lesson Plans

### Teaching Plan

#### Internet Skills Workshops

<table>
<thead>
<tr>
<th>Session 1</th>
<th>Date</th>
<th>Group 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time</strong></td>
<td><strong>Activity</strong></td>
<td><strong>Resources/Notes</strong></td>
</tr>
<tr>
<td>First Hour</td>
<td>Registration &amp; select respondents for RMA</td>
<td>Data projector</td>
</tr>
<tr>
<td>0-60 minutes</td>
<td>Logging on to the system</td>
<td>Students need to have checked their usernames and passwords</td>
</tr>
<tr>
<td></td>
<td>Enrol on VLE</td>
<td>OHP with URL</td>
</tr>
<tr>
<td></td>
<td>Email send/retrieve</td>
<td>Some students do not know how to reply to email attachments</td>
</tr>
<tr>
<td></td>
<td>Practice (5-10 mins)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Discussion Board</td>
<td></td>
</tr>
<tr>
<td>Break 15 minutes</td>
<td>Practice (10-15 minutes)</td>
<td></td>
</tr>
<tr>
<td>75-150 minutes</td>
<td>External links &amp; bookmarking</td>
<td>Library 1 page</td>
</tr>
<tr>
<td></td>
<td>Organising bookmarks</td>
<td>Onnes not compiled</td>
</tr>
<tr>
<td></td>
<td>Practice (10-15 minutes)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Creating new folders on the H drive</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Scanning and uploading an image to VLE</td>
<td>Student photos / Zip disk / scanner</td>
</tr>
<tr>
<td></td>
<td>Discussion &amp; Feedback (10-15 minutes)</td>
<td>Survey session needs layering into and session</td>
</tr>
<tr>
<td></td>
<td>Collect RMA</td>
<td></td>
</tr>
</tbody>
</table>

### Reflection/action Plan

On time needed for logging on - students not using the student numbers provided. Not using initialism, some need guidance on more skills with the image on the library page. Scanning needs only 1 scan can then no access due to zip disks. Needs copy to PV and held. Know if the new makes it difficult to see what the students are doing. Manual calibration is best place. May have no feedback on their system.

Next session - level 1 skills much lower than I expected. Students her very experienced.
# Teaching Plan
## Internet Skills Workshops

### Session 2

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Resources/Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-60 minutes</td>
<td>Registration (identify students for observation)</td>
<td>Data projector</td>
</tr>
<tr>
<td></td>
<td>Navigation in Netscape</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Saving documents – from the Internet/VLE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ipage web guides</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Search engines</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Meta search engines</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Continue scanning</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Student photos / Zip disk /scanner</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Keyword exercise</td>
<td>OHP with keywords</td>
</tr>
<tr>
<td></td>
<td>Discussion</td>
<td></td>
</tr>
<tr>
<td>Break 15 minutes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>75-135 minutes</td>
<td>Advanced searching &amp; Boolean terms recognising URLs</td>
<td>Library I page</td>
</tr>
<tr>
<td></td>
<td>Practice</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Discussion &amp; Feedback (10-15 minutes)</td>
<td></td>
</tr>
</tbody>
</table>

### Reflection/action Plan

A students in the group who did not attend the previous week. Bright then upset speed and other students were able to start off well. Search exercise at different engines. Students had access of gateways that might be useful. General bulletin board sites is a bar keyword online general IBF and discussion. Did evaluate the rules & rules...

Formal students + JJ seemed to be quite not very much in 1 enthusiastic but no new experience.
# Teaching Plan

## Internet Skills Workshops

### Session 3

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Resources/Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Hour</td>
<td>Registration (identify students for observation)</td>
<td>Data projector</td>
</tr>
<tr>
<td>0-60 minutes</td>
<td>Logging on to the system</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Re-cap</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Set task finding wholesale suppliers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(divide group help students who have missed sessions to catch up)</td>
<td></td>
</tr>
<tr>
<td>Break</td>
<td>15 minutes</td>
<td></td>
</tr>
<tr>
<td>75-150 minutes</td>
<td>One-one help as required</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Discussion (10-15 minutes)</td>
<td></td>
</tr>
</tbody>
</table>

### Reflection/Action Plan

8 students in this session who attended session 1 but not 2 had to put their work speed. All students still have support to put together some article. The skills covered in the earlier session seem that they have not helped in learning, which I asked the group to fill in with access to the system. A telephone with the system, which is still available, was used to find some of the online materials to use online to contact the suppliers. Students seem to be well developed. Need to get exercises to do more. Closes to answer met the required teaching skills.

159
Appendix 3: Pilot Results Research Methods Activity

<table>
<thead>
<tr>
<th>Tutor Code</th>
<th>T</th>
<th>A</th>
<th>V</th>
<th>E</th>
<th>Mean Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fabric Research</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select Fabrics</td>
<td>10</td>
<td>7</td>
<td>17</td>
<td>5</td>
<td>39</td>
</tr>
<tr>
<td>Look For Fabric Suppliers In Trade Directories</td>
<td>9</td>
<td>5</td>
<td>15</td>
<td>3</td>
<td>32</td>
</tr>
<tr>
<td>Contact Wholesale Fabric Suppliers</td>
<td>9</td>
<td>6</td>
<td>16</td>
<td>4</td>
<td>35</td>
</tr>
<tr>
<td>Visit Retail Fabric Suppliers</td>
<td>9</td>
<td>32</td>
<td>32</td>
<td>2</td>
<td>75</td>
</tr>
<tr>
<td><strong>Trend Research</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Look At Trend Forecast Publications</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>Research Fabric Trends</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>Research Colour Trends</td>
<td>3</td>
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<td>View Relevant Videos (TV Footage And/ Or Films )</td>
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<td>18</td>
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<tr>
<td>museums)</td>
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<td>Visit specialist/other libraries</td>
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<td>Research colour trends</td>
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<td>Look at trend forecast publications</td>
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<tr>
<td>Look at Lifestyle magazines</td>
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<td>5</td>
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<td>Visit retail fabric suppliers</td>
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<tr>
<td>Select fabrics</td>
<td>8</td>
<td>15</td>
<td>9</td>
<td>24</td>
<td>32</td>
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<tr>
<td>View relevant videos (TV footage and/ or films)</td>
<td>7</td>
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<td>4</td>
<td>8</td>
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<td>Search for relevant articles in the trade press</td>
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<td>26</td>
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<td>19</td>
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<td>Sample with the selected fabrics</td>
<td>8</td>
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<td>18</td>
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<tr>
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<td>32</td>
<td>21</td>
<td>5</td>
<td>19</td>
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<td>Develop ideas in 3d (modelling/maquettes)</td>
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<tr>
<td>Look at relevant CD Roms</td>
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<td>14</td>
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<td>10</td>
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<tr>
<td>Contact wholesale fabric suppliers</td>
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<td>8</td>
<td>28</td>
<td>20</td>
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<tr>
<td>Contact relevant trade associations</td>
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<td>27</td>
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## Appendix 5: Data from the Research Methods Activity Sorted by Mean Score

<table>
<thead>
<tr>
<th>Activity</th>
<th>Mean Score</th>
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<tbody>
<tr>
<td>1 Visit the college library.</td>
<td>2.67</td>
</tr>
<tr>
<td>2 Decide on theme</td>
<td>3.39</td>
</tr>
<tr>
<td>3 Collect visual images relating to theme/topic</td>
<td>4.32</td>
</tr>
<tr>
<td>4 Research into background of theme/topic</td>
<td>6.21</td>
</tr>
<tr>
<td>5 Look at fashion magazines</td>
<td>6.78</td>
</tr>
<tr>
<td>6 Sketch initial ideas</td>
<td>6.78</td>
</tr>
<tr>
<td>7 Search the library OPAC</td>
<td>7.58</td>
</tr>
<tr>
<td>8 Visit relevant exhibitions (art galleries and/or museums)</td>
<td>8.11</td>
</tr>
<tr>
<td>9 Visit fashion stores</td>
<td>9.74</td>
</tr>
<tr>
<td>10 Do an Internet search</td>
<td>9.94</td>
</tr>
<tr>
<td>11 Develop ideas through exploratory drawings</td>
<td>10.2</td>
</tr>
<tr>
<td>12 Visit specialist/other libraries</td>
<td>10.8</td>
</tr>
<tr>
<td>13 Research colour trends</td>
<td>11.1</td>
</tr>
<tr>
<td>14 Search for relevant newspaper articles</td>
<td>11.2</td>
</tr>
<tr>
<td>15 Look at trend forecast publications</td>
<td>11.4</td>
</tr>
<tr>
<td>16 Look at fashion Internet sites I know</td>
<td>11.8</td>
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<tr>
<td>17 Visit the Library I page</td>
<td>12.4</td>
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<tr>
<td>18 Decide on colour palette</td>
<td>12.5</td>
</tr>
<tr>
<td>19 Research fabric trends</td>
<td>12.6</td>
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<tr>
<td>20 Look at Lifestyle magazines</td>
<td>12.7</td>
</tr>
<tr>
<td>21 Visit retail fabric suppliers</td>
<td>13</td>
</tr>
<tr>
<td>22 Select fabrics</td>
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</tr>
<tr>
<td>23 View relevant videos (TV footage and/or films)</td>
<td>15.7</td>
</tr>
<tr>
<td>24 Search for relevant articles in the trade press</td>
<td>16.1</td>
</tr>
<tr>
<td>25 Sample with the selected fabrics</td>
<td>16.6</td>
</tr>
<tr>
<td>26 Conduct market research</td>
<td>17.2</td>
</tr>
<tr>
<td>27 Develop ideas in 3d (modelling/maquettes)</td>
<td>19.8</td>
</tr>
<tr>
<td>28 Look for fabric suppliers in trade directories</td>
<td>23.6</td>
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<tr>
<td>29 Look at relevant CD Roms</td>
<td>24</td>
</tr>
<tr>
<td>30 Contact wholesale fabric suppliers</td>
<td>24.7</td>
</tr>
<tr>
<td>31 Contact relevant trade associations</td>
<td>25.3</td>
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</table>

In this table a low score indicates that an activity was given higher priority by the respondents.
<table>
<thead>
<tr>
<th>Main issues arising from the observations/ design research task</th>
<th>Interview Questions Pre Pilot</th>
<th>Interview Questions Post Pilot</th>
<th>Related Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem solving, and cognitive strategies</td>
<td>Tell me how you went about the research for your final major project?</td>
<td>Tell me how you went about the research for your final major project?</td>
<td>To assess the students ability to apply appropriate strategies for independent learning</td>
</tr>
<tr>
<td>Time management research skills / Planning strategy</td>
<td>Did you visit the Library for your PMP research? What for? Do you use the Library 1-page /WGSN? How often and for what? Have you ever contacted a trade association/ used a trade directory? Who, what &amp; when for?</td>
<td>Did you visit the Library for your PMP research? Do you use the Library 1-page, WGSN, OPAC Blackboard? How often what for? Have you ever contacted a trade association? Used a trade directory (who, what &amp; when for)?</td>
<td></td>
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<tr>
<td>Using existing resources / Trade directories/ associations / Library</td>
<td>When you find a list of results from a search: how do you identify which ones will be useful? Do you think that the information on the Internet is accurate? How do you know if it is a valid source of information?</td>
<td>When you find a list of results from a search: how do you identify which ones will be useful? Do you think that the information on the Internet is accurate? How do you know if it is a valid source of information?</td>
<td></td>
</tr>
<tr>
<td>Need to be able to analyse and evaluate information (knowing how to validate and recognise source of information)</td>
<td>What sites do you visit most? What for?</td>
<td>What sites do you visit most? What for?</td>
<td></td>
</tr>
<tr>
<td>Students lack of knowledge of useful sites (not using Outlook on job sites)</td>
<td>Do you ever use information from other parts of the course to help you use the Internet? What/How</td>
<td>Have you ever used notes from any of your workshops or lectures to help you in your research? gg: Textiles, business, contextual studies, IT How much knowledge do you have about fabrics? Do you think this is enough? What strategies would you use to find out more?</td>
<td></td>
</tr>
<tr>
<td>Transfer knowledge from other areas of the course that using knowledge gained from TT classes</td>
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Appendix 5.4 Pre and Post Pilot Interview Questions
<table>
<thead>
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<th>Main issues arising from the observations/ design research task</th>
<th>Interview Questions Pre Pilot</th>
<th>Interview questions Post Pilot</th>
<th>Related Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verbal information, Rules and defined concepts and motor skills</td>
<td>What terms do you use when you are looking for fabric? Did you have any problems with finding the right words? Do you have any difficulty with how to spell some of the words? Do you know how to scan read? Did you come across any terms you didn’t understand?</td>
<td>What terms do you use when you are looking for fabric? Did you have any problems with finding the right words? Do you have any difficulty with how to spell some of the words? Do you know how to scan read? Did you come across any terms you didn’t understand? Do you know what the American term for clothing is?</td>
<td>4. To identify areas in which students have difficulty in using or applying the technology and to propose strategies that may be useful in overcoming these problems.</td>
</tr>
<tr>
<td>Literacy (spelling, synonyms etc.) technical terminology American terminology</td>
<td>Computer literacy (basic functions, organising and structuring information) scan reading</td>
<td>Need for keyboard skills and knowledge of basic commands</td>
<td>Technical literacy not using appropriate term (not aware of different search engines search tools) Advanced search techniques Boolean terms</td>
</tr>
<tr>
<td>Content</td>
<td>Difficulty in finding appropriate information. Lack of Information on sites. Too much information is confusing American bias of the content on the web</td>
<td>What do you think about the information on the textile sites you found? Was it useful? Do you think it is quicker easier to find information on the internet than it is to find it from other sources? Why? What if anything do you think would make the process easier?</td>
<td>When you find textile sites do you find the information on them useful? Which of any of the following sites have you visited? Fashion web, Textile Institute, Textile web, Apparel net, Fashion UK, First view, Premier vision, London Fashion Week, Courtaulds, Woolmark, WGSN, SATRA Do you think it is quicker easier to find information on the internet than it is to find it from other sources? Why? What if anything do you think would make the process easier?</td>
</tr>
<tr>
<td>Poor site design</td>
<td>Do you find most of the sites you find easy to navigate/understand? What kinds of things on sites do you find confusing?</td>
<td>Do you ever get lost or confused whilst using the Internet? What kinds of things do you find confusing?</td>
<td></td>
</tr>
<tr>
<td>Main issues arising from the observations/ design research task</td>
<td>Interview Questions Pre Pilot</td>
<td>Interview questions Post Pilot</td>
<td>Related Objectives</td>
</tr>
<tr>
<td>---------------------------------------------------------------</td>
<td>--------------------------------</td>
<td>-------------------------------</td>
<td>--------------------</td>
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<tr>
<td><strong>Attitude Confidence</strong></td>
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<tr>
<td>Positive/negative attitude towards the Internet</td>
<td>What do you like/dislike about using the Internet?</td>
<td>What do you like/dislike about using the Internet?</td>
<td>1. To examine the ways in which students' interact with the Internet/WWW 2. To determine their levels of confidence and ability in using the Internet/WWW</td>
</tr>
<tr>
<td>To try new search engines</td>
<td>Which search engines do you like to use? Why? Which search engines have you used?</td>
<td>Which search engines do you like to use? Why? Which search engines have you used? Do you understand how they work?</td>
<td></td>
</tr>
<tr>
<td>To contact suppliers</td>
<td>Had you ever contacted a wholesale supplier for fabric before this project? If not why not? Did you have any problems with this?</td>
<td>Had you ever contacted a wholesale supplier for fabric before this project? If not why not? Where did you find their address/tel number? Which companies did you use? Did you have any problems with this? Were you able to understand the terms they used/describe accurately what you were looking for? Did you receive any samples?</td>
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<tr>
<td><strong>Experience</strong></td>
<td>When did you first use the Internet? How often do you use the Internet? What for? Do you use it socially? What for? Do you have access outside of college?</td>
<td>When did you first use the Internet? How often do you use the Internet? What for? Do you use it socially? What for? Do you have access outside of college?</td>
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<tr>
<td>To use e-mail to contact companies</td>
<td>When you were searching for fabrics on the Internet did you use e-mail to contact a supplier? If not why not? Would you feel comfortable doing this why/why not?</td>
<td>When you were searching for fabrics on the Internet did you use e-mail to contact a supplier? If not why not? Would you feel comfortable doing this why/why not?</td>
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<tr>
<td>Need for a stable connection and reliable software/hardware so students can trust the computer and not get frustrated</td>
<td>Did you have any technical problems with the equipment? What happened? How did you feel about this?</td>
<td>Did you have any technical problems with the equipment? Does it ever crash on you? How does this make you feel? Do you know what to do when this happens?</td>
<td></td>
</tr>
<tr>
<td><strong>Relate activity to real world problems</strong></td>
<td>Do you think that the Internet is a useful resource for fashion students? What knowledge and skills do you think a fashion designer needs in the industry? Do you see a role for the Internet in helping you develop these skills?</td>
<td>Do you think that the Internet is a useful resource for fashion students? For what purposes do you think you might use the Internet in the fashion industry?</td>
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## Appendix 7: Observation Chart

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<th>L</th>
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<th>F</th>
<th>H</th>
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Appendix 8: Table showing the Skills and Knowledge required for a successful Internet Search to Source fabrics as identified in the observations and organised according to Gagné's Taxonomy

<table>
<thead>
<tr>
<th>Motor skills</th>
<th>Cognitive strategies</th>
<th>Intellectual Skills</th>
<th>Attitudes</th>
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<td>Use Boolean search terms/advanced techniques to refine or expand search</td>
<td>Use appropriate garment apparel terminology</td>
<td>Wanting to use computer</td>
</tr>
<tr>
<td>Control mouse</td>
<td>Use Boolean search terms/advanced techniques to refine or expand search</td>
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<td>Wanting to use computer</td>
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<tr>
<td>Evaluate organised search results; Scan reading/scroll through information</td>
<td>Evaluate organised search results; Scan reading/scroll through information</td>
<td>Use appropriate garment apparel terminology</td>
<td>Wanting to use computer</td>
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<td>Problem Solving: Identify appropriate key words, relate existing knowledge to new situation, seek alternative solutions</td>
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<td>Recognise relevance of activity to real world</td>
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<td>Use appropriate garment apparel terminology</td>
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<td>Recognise relevance of activity to real world</td>
<td>Use appropriate garment apparel terminology</td>
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Appendix 9: Sample Interview Transcript Respondent L

Q. In the process of that, did you go into the library?

A. Yes I did go into the library, just to look at things for reference, because I had most of my research already. It was just things like the companies, finding out more about the companies, looking at the Internet, the market, more like images and fabrics. It was more of that kind of research, rather than the theme.

Q. So you already had a visual research?

A. Yes.

Q. Where did you get that information from?

A. Well I had it from magazines, also the company that I chose to work for, then just looking through books on the body, any buildings, just taking things that related to it, like even the new tube station. I looked at things like that and took images, that all related to what I was trying to produce or show.

Q. You said you used the Internet, what did you find there, what were you looking for?

A. I looked at the Internet more for the company, because I already phoned them up, and asked for a press pack, they didn’t have that much to offer, so I looked on the Internet site which was quite useful, and it showed what their shop looked like. You could travel in the shop and you could see their latest collections and their previous collections. If you wanted to find out more you could join and become a member. It just gave you lots of information about this, the specialist fabrics, and things like that.

Q. Have you used the worth global network card we gave you?

A. No I haven’t. I wanted to get my computer connected to the Internet so I could have a look at it properly, I’ve been so busy, that I thought if I use it now I’ll run it up in the month when I won’t need to get so much out of it.

Q. The card lasts for six months.

A. Six months? I thought it was only for a month. I wanted to look at it properly, and I haven’t had enough time nip down to JPS. I wanted to get the full advantage.
Q. What about the blackboard, do you use that at all?

A. I've used it a few times, but not that much, because in the last couple of months, I haven't really been over at IPS, I've spent a lot of my time at Curtain Road.

Q. You can access it here. 

A. Yes I know. Also my password. I'm not really a computer person that much, even though I've been wanting to go on it, I haven't really used it as much as I should.

Q. When you say that you're not really a computer person, can you describe what that means?

A. I always try and stay away from computers or computer games, I've never really been into it. But now I try and get myself to be more familiar with the Internet and e-mails. I'm not confident enough about using them. I feel I need to go on it and use it. I don't think it's difficult, I just need to get used to using the system.

Q. When you came to college, is that the first time that you used the Internet?

A. Yes it was the first time I've used it. We had that introduction to the Internet. I had used it in the library before that, I didn't really understand, it seemed a lot more complicated than it was.

Q. So the lessons that you had with me, did you find that useful?

A. Yes I did find those useful. I think you should have them a bit more. It was just four lessons, there were a lot of people, I just think a few more, so you can really understand the scanning and things like that. Everyone was at different stages, so it was just trying to get onto it, and recalling everything that you've done. I felt that maybe if it there was another lesson, if you had wanted to go over something, it would have been quite useful.

Q. Would an on screen lesson be helpful, like a tutorial?

A. I think it would be useful, although I know the general, I don't feel like I can say I'm going to send this e-mail. Even though I don't think it's complicated, but I feel I'm not quite sure. Even though I know it, I would like to be able to feel that I could just type it up and send it. But I still feel that I'm a bit rusty and I need a bit of fine-tuning, to just get confident enough to use the system.

Q. Do you worry about things going wrong?

A. I used to worry about things. Before I got my own computer, I used to think, even now I think I'm going to crash it, but it is quite difficult unless you really mess it up to make the computer crash, so it's just having confidence to explore things, open and close things and knowing what to do.

Q. Do you know what to do to get out of a crash?
A. Well you can switch it off with the reset button, or with different computers you can press certain keys and it resets it. If it’s not something else then it will reset it, but otherwise you will have to reset it.

Q. So you’re not so worried about that side of things?

A. No not any more.

Q. On the Internet is there anything that worries you?

A. I’m not really worried about anything. I’d just like to do more with it. I’d like to have my own web page, because everyone seems to be doing it. I’m like it can’t be that complicated, if anyone can do it, it’s just a case of knowing how. It’s like years when you didn’t know about the computer and it seemed like oh my god. I’d like to be able to feel confident to make my own web site, scan things on there. Just be able to do these basic things.

Q. Just flipping back to the library, did you ever use any of the trade directories in there?

A. Yes I did. Not so much now, not on this particular project, but for the previous project, I looked through the trade directories.

Q. What sort of things were you looking for?

A. Company names, suppliers, information on their turnover, if they’re expanding, how many stores they have, if they’re merging, or if they have other companies within their big groups. Things like that really.

Q. You said suppliers, was that for fabrics?

A. Suppliers for fabrics, sponsors or specialists. People you might not know within London, outside London or outside of the U.K.

Q. Are you aware of any trade directories on the Internet?

A. Not really, because I haven’t been on it enough, but I know that there probably is, because there’s nearly one for everything now.

Q. When you do use the Internet and you do a search, how do you identify from the results, what might be useful to you?

A. With the library Internet, depending on what user you use, it tells you the percentage of if it’s nearest to what you want, so I either read it or flick through what looks most relevant. Some of them you can see, that it’s not really, it might be London shoes or something like that.

Q. When you get information, do you think it’s accurate?
evaluation skills

A. If it's the company site, then I assume it's accurate, depending on what it is that I'm trying to find out, then if the company didn't put it up there, then I'd be a bit unsure, but I'd think it was fairly accurate.

Q. You said you'd see if it was a company site, are there any other ways you use to validate sources of information to see if their accurate.

A. I'm not really sure. I mean I just read it and see generally whether it seems correct or whether it's just far out, because you can put anything up there.

Q. When you use the Internet, what sites do you visit most?

A. Because I haven't really been using it for leisure, I've more used it when I need to look for specific things, it's more like with companies, or fabrics or just looking at the Vogue.

Q. Can I just go through some sites and you tell me whether you've been to them?

Fashion wear?

A. I think I've been on that. Is that part of the Vogue, or is that just a specific site?

Q. A specific site.

A. I think I have been on it and had a quick look.

Q. Textile Institute?

A. No I haven't been on that one.

Q. Textile Wear?

A. No.

Q. Apparel net?

A. No.

Q. Fashion U.K.

A. Yes

Q. First View?

A. Yes

Q. Premier Vision?

A. No.

Q. London Fashion Week?
A. I think I saw that one

Q. Wallmark?

A. I think I have been on Wallmark, yes.

Q. Worth you said you haven't?

A. No.

Q. Do you think that it's quicker and easier to find information on the Internet, than other sources. Or do you think it's slower?

A. I think it's quicker to find out if they haven't got it really, because if I wanted to look up something about Wal-Mart for instance, it's quicker to just type it in and see if they have it on the Internet. You can find out whether they have it or not, and then look for it somewhere else, like write off to the company or through business files or something like that. I think it's easier to find the information and also to find out if they don't have it. So it saves you having to go through loads of books or magazines and things.

Q. Have you ever contacted a trade association?

A. Yes.

Q. Which one?

A. It was the London show, but Barker Browns event, I did one of the shows with them, and that was quite useful, because I went around all the stands, and spoke to all the stands nearly, and you met a lot of interesting people. Some still in contact, so it's quite good really. And the London Fashion week as well. I was with the organisers. That was basically front of house and going around as well to all the stands.

Q. So a job related thing?

A. Yes.

Q. Have you contacted one for information?

A. Not really.

Q. Do you ever refer back to your notes from other workshops or lectures from other areas of the course to help you with your research. Things like textile technology?

A. I kept all the IT stuff and also business stuff as well. Those are the two I've probably used the most.

Q. So you didn't just keep them, you did actually use them?
Q. How much knowledge would you say you have about fabrics. How confident do you feel?

A. I don’t feel that confident. I don’t feel that I know enough about fabrics. I mean general fabrics, but I couldn’t say that that’s got that and such and such. Somethings I’m still not sure about. I don’t feel that I’m very confident.

Q. So if you’re contacting the wholesale supplier, would you know what to ask for.

A. Yes. With that I would know what I was looking for. I’ve done that when we had to ring up different companies. I felt confident about that, but if it was something that I didn’t know, or if I had to identify different fabrics, I could roughly guess, but I don’t think I’m confident enough if to say I was at work to say go and buy this, or a certain type. It’s just like knowing the fabric content and things like that. I don’t feel that confident about that.

Q. Did the wholesalers use any terms that you didn’t understand where you thought what are they talking about?

A. Not really, because the fabrics I was asking for, they might not have needed to use the terms, but they could have asked about the weight and things like that.

Q. And would you have known what to ask for?

A. Well I would probably have to ask them. I’d have a rough idea, but I’d say would that be like calico weight, depending on whether they said a certain gram and I didn’t know what the fabric would look like when you actually felt it, then I’d probably ask them.

Q. Would you think about asking them what sort of end product it might be used for?

A. I probably would, but I felt that if I was calling them, I’d probably have an idea what I would want to use it for.

Q. What do you think you could do to find out more about fabrics?

A. I think like the Textile Institute would be quite good, and also there’s a gallery not the Textile Institute, they can also send you information, Textile something, I can’t remember the name of it, sorry. They can send you information, or you can look on the web now. There’s lots of things on fabrics and I’ve actually looked on there and found out about different fabrics, and they tell you what it’s made of, what it can do, what the content, fibre content and weight and things like that. So that’s quite useful. There’s books and magazines and things.

Q. Do you know which sites they were that you looked at to find out that information?
A. I can’t remember off the top of my head, but there’s sites that you can use to get into them, and you can then find out about lots of different companies that specialise in fabrics and certain types, but I can’t remember the site.

Q. Are there certain search engines that you like to use when you go onto the Internet?

A. Yes I do tend to use Yahoo and about two other ones like Lycos and a different one. I haven’t been on it for a while and there’s so many, but I do tend to use the same three.

Q. Why’s that?

A. I think I just found them easier to look at, or maybe just for the information, the way they lay it out.

Q. And if you did a search and you didn’t find anything on those three, would you go to another one?

A. Yes.

Q. And how would you decide what other one you would go to? At random?

A. I think sometimes I just go to the site and see what kind of information they do and if it’s not appropriate then I’ll just go onto the next one.

Q. Have you ever used a Meta search engine?

A. No.

Q. Gateway?

A. I’ve used a gateway.

Q. Do you know which one?

A. I can’t remember.

Q. And what about the web guides on the library eye page, have you used those?

A. Yes I think I have used them.

Q. It’s not something you’ve used often?

A. Not really.

Q. What about on the blackboard, have you ever used the external links on that?

A. I used it once or twice, but not very often.
Q. Before we did this project, where we made you contact an outside supplier had you done that before?

A. No. Not through using a phone, or that far. It’s more just going to the shops and asking them how much this would be, or if they could get this and stuff like that. Not actually going out of London so much and speaking to different people.

Q. Was there a reason for that?

A. You just always think you’re going to get the fabrics down the road. But I think you just think that when you’re out. Then you have to do something like that, but you don’t really think that you’re going to need to while you’re still studying, unless you want something really exotic, or you’ve actually been out of London or somewhere else and seen the fabric, so you specifically wanted that. You can always go here or there or they’ll send you somewhere else that you can get the fabric.

Q. Having done it, do you think that there is an advantage in using a wholesaler?

A. Yes I think there is an advantage if you’re planning to make a lot of garments, cost wise, but if you’re just making a few pieces, then I suppose it depends how much they’re prepared to, the smallest amount, then I suppose you could save money. You can also get discount from local fabric suppliers if you buy more. It depends really how many garments you’re planning to make, and how much it costs to get the fabrics to you as well.

Q. Did you see an educational value in doing it?

A. Yes.

Q. What would that be?

A. I thought it was good, because it also gave you confidence, to speak to other people and try and sound professional and knowing what you want and try and get that across to someone else. It was confidence building, especially speaking on the phone, and all over the country. Also trying not to sound stupid, or sound like you don’t know what you’re talking about, and getting someone else to take you seriously on the phone. I thought it was useful for that.

Q. Having done it once, do you think next time you would find it easier?

A. Yes. And also you can sound totally different. It’s not like when they see you and think oh no student. You can sound a lot more grown up, and say whatever really, see how far you can go.

Q. Did you try sending an e-mail, to try and get any fabrics from anybody?

A. No not really. I’m a bit nervous of e-mails and stuff. I’ve only done it once or twice. I feel I need to send some and just get used to doing it.

Q. Do you have access to the Internet, e-mail at home?
A. No, but my computer is set up for it, I just need to get the cable and connect it.

Q. So you haven’t got around to it yet, how long have you had the computer?

A. About five months.

Q. Can you see an advantage in doing it?

A. Yes. I was planning to go and get it, but it seems like one of those things I don’t get round to. Whenever I go on it, it’s only when I have to type something or do something with it. I don’t have time to sit there. I thought I’ll teach myself about it. I thought I’d be able to be scanning, and the scanners been freezing, and I’m like oh god, I need to go on decent training.

Q. You’re probably trying to scan at too high resolutions.

A. Yes, it’s just little things like that, it’s like it’s crashing and then it’ll freeze, I’ll just get nervous. I don’t want to break it.

Q. When it crashes, what do you do?

A. I normally re-set it.

Q. Do you think the Internet is a useful resource for fashion students?

A. Yes I think it is useful. Now people are using it as an instrument. Rather than people going out and trying to find jobs, you can have your own website, and if someone in the fashion industry sees this, then they’ll call you. It’s just a way of advertising yourself to other people around the world, anywhere, any time, it doesn’t limit you to one place, or one country.

Q. If you go out into the industry, other than promoting yourself, can you see other uses for it?

A. Yes I think it’s good business wise, if you wanted to sell things on the Internet, it saves cost. It’s an affective easy way that everyone has access too. You don’t have to go to a shop, everything is there for you to just log on to and buy if you want to.

Q. Did you have any problems with words when you were using the Internet, did you have any problems with spelling things?

A. Yes, because I have a problem with spelling. I know somethings I can’t spell, but sometimes I get more nervous when I think I have to write something for someone. Even if I could spell it normally, but the thought of having to type it, and them seeing my mistakes, makes me even more nervous, so I just write it and then type it afterwards. So I do have a problem with spelling, it’s not so much the words, but just the spelling, sometimes making sure it’s in the right grammatical order.

Q. Do you use the spell check on your machine?
A. Yes.
Q. That helps?
A. Yes it does help.
Q. Do you know that you can use spell check on e-mails?
A. Can you? That's good.
Q. Would you feel more confident if you could use that?
A. Yes.
Q. Do you know what the American term for clothing is?
A. Garments?
Q. If I said apparel would that mean anything to you?
A. No.
Q. If you came across (hat word on the Internet you would be a bit confused about what it was?
A. Yes. I don't really know.
Q. What sort of things would you still like to learn?
A. When I ring up if I have a problem with my computer, I still feel computer illiterate, because I don’t know things like how many memory and when you scan it, you can transfer it. I know things you can do, but I can’t do them yet and knowing about the memory and how to change this. Things that seem simple, but I need to get trained and then feel more confident.
Q. Did you get any manuals with the computer?
A. No.
Q. Maybe you should get hold of some.
A. Yes I think I have to buy it separately. But I want to join, there’s a magazine for it. The Mac.
Q. Have you got an apple Mac?
A. Yes, but not the monitor, it’s different, it’s just the system. I was going to subscribe to them, so I could find out more, and do an evening course or something.
Q. If you got an Internet connection, you could go to the web site and do it for nothing. Do you know how to copy and paste?
A. Yes.  

Q. Can you create folders?
A. Yes. 

Q. Use bookmarks on the Internet?
A. No. 

Q. Organise things?
A. No I haven’t done that. 

Q. Do you know how to put an attachment on to an e-mail?
A. No. 

Q. We did file search techniques in the classes, do you remember those?
A. Yes. 

Q. Have you use them since?
A. No. 

Q. Do you know how to do an image search?
A. No. 

Q. Do you ever get lost or confused when you’re using the Internet?
A. It’s not so much lost, but you can get lost in the search. You sometimes think I’ll just check in this and it just continues. You can be on there for an hour or two hours, just looking for information. It seems to go on for so long sometimes. You just go deeper and find out more things, and one thing leads to another. 

Q. Are they useful things, or not useful things?
A. I think sometimes they can be useful, sometimes they can just side track, or information you don’t really need. So you go back and try another. You have so many options on it. You can be there for hours looking through them. 

Q. So you can waste time rather than save it?
A. You can sometimes. If you’re trying to find information and you think that might be useful and just have a look and see what’s in that box or column and it leads you to
something else, you think that’s quite interesting, I might print that, it just leads you to other things.

Q. So it’s easy to wander?

A. Yes.

Q. Do you ever find yourself looking at things that have absolutely nothing to do with what you need?

A. Yes, sometimes you get a bit side tracked.

Q. In terms of site designs, is there anything that you find confusing when you actually get to sites.

A. Not really. Sometimes you’re not sure if something is not highlighted, whether you can click on it, and it will lead you to something else. Where as on other sites it’s a different colour.

Q. Do you ever find yourself lost in an advert or gone into something that you can’t get out of.

A. Yes I think I have once, but not very often.

Q. So that generally isn’t an issue for you?

A. No. Not really.

Q. How would you describe your feelings towards computers and the Internet?

A. I used to just try and avoid them, but now I’m trying to embrace them. Just try and make myself at least familiar enough to be confident about going somewhere and doing something and not have to worry about whether I’m doing this right. Because I feel like everyone else is, that you’re not catching up with this whole Internet revolution.

Q. You think it’s going to be something that’s important for you in your career?

A. Yes definitely. Even before the Internet, you had to know about computers. Before they would train you, but now they just expect you to know, up to a certain level. So you at least have to be at that level and be aware of all the things that are happening and what you can do with them. Because it changes every year. You do have to know, otherwise when you do go out into the industry or work, whatever you do, the computers are so integrated into everything, that you just be left out in the cold, and you would have to start learning it anyway.

Q. I think we’ve covered everything, so thank you very much.
Appendix 10: Table showing the Issues that were evident in the data at each stage of the study

<table>
<thead>
<tr>
<th>Issue</th>
<th>Research Methods Activity</th>
<th>Observations</th>
<th>Interviews</th>
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<tr>
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<tr>
<td><strong>Attitudes</strong></td>
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<td>Attitudes of Suppliers</td>
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<tr>
<td>Time</td>
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Observation Respondent L 21/10/99

10:45-11:05

J: I want you to try and find some fabric for your current project using the search techniques we covered in the class. I will ask you questions about what you are doing OK?

L: Yes

J: So where do you want to start?

L: Because it covers the whole web

J: What are you going to put in there?

L: Fashion textiles

J: Do you have anything particular in mind that you want to find?

L: I’m not too sure I am just going to see what they have

(Entered search term Fashion Textiles—several pages—only looked at first 2)

L: If I want to go on to the next page do I just click?—navigation—

(Had to show her where the link was to move to the next set of results—Found a site she had bookmarked already) —uses bookmarks—

J: What are you doing?

L: I am just reading what people have

(Moved to next page)

(21-30 did not know that only showed 10 results at a time—Found a site Nottingham Trent)

J: Do you know what ac in a URL means?

L: No

J: It is an education site do you think it would be useful for finding fabrics?

L: NO

(Clicked on URL that had .com site was not useful—Sheila’s dressmaking page—Returned to list clicked on Woolmark—book marked the site)

L: I’ll get lots of other addresses from there

J: Is there any information about suppliers?

L: What does apparel mean?—knowledge exposed—

J: It is the American term for clothing. What do you want to do now?

L: Go back to the previous list and see if there is anything there

(Clicked on Fabric terms A-Z)

J: Could that be useful?

L: Yeah it could be useful if you are looking for certain types of fabric

(Found trying to navigate through the glossary kept coming back to S)

J: Anything else there?

L: A retailer’s forum—North American

J: Mills and manufacturers that sounds quite useful?

L: I will be pleased to get some fabric samples in the UK—easier?

J: So what have we got there, there is womenswear—(found a picture of a fabric swatch)

L: There is some jersey there

L: I’ll go back to where it had all the dresses and jackets

J: Which theme are you doing?

L: Tailored to perfection

J: What are you going to be making?

L: A jacket
L: I am not with it today

J: Perhaps if you tried outerwear that is a term for coats and jackets

L: At least it shows you what it is like but it doesn't have any

J: Does it tell you how to order it

L: No

J: I wonder if there is a list of mills on the site?

J: Look at the links on the bottom there is usually a home button or a site map-

J: What have we got here?

J: Lots of companies

L: Wonder if there is a list of mills on the site?

J: Look at the links on the bottom there is usually a home button or a site map-

J: What have we got here?

L: Lots of companies and what are these links?

(Did not recognise a live link, explained that when the cursor changed this was a link
-Clicked a link)

J: Is that useful?

L: Yes

J: Where are you going to go? (Clicked a link)

J: Technical info about fibres that one-Rugged outerwear apparel is that useful?

J: Wonder if it is for outerwear it depends what kind of jacket I am making

J: Active fabric for snowboarding

J: Any names there that you recognise?

L: (not audible) I looked on their website before

J: What sort of fabric are you looking for?

L: I want something medium weight wool mixed fabric

(Back to search engine)

J: Why don't you try searching for wool fabrics and see what happens?

L: It is for outerwear apparel that is useful?

J: Wool blend OK are you putting it in commas?

L: Oh Ok

(Typed wool fabrics in " marks)

J: Is that fabrics or garments? - Exclusive collection of sports coats-Is that any well?

L: No

J: Menswear, menswear, outerwear, minimums 500 metres per colour

L: Oh!!

J: That is not unusual for wholesale suppliers but it doesn't mean that you can't get

swatches from them

J: Where is the email?

L: What are you going to ask for?

L: I am going to have to think about what I say before I actually send it off how to ask

for what I want because I am not too sure

J: Right, well you want swatches. What are they offering? Just click back on here

Meltons, velour cashmere, camel and mohair blends in rich colours

(Showed her how to copy and paste the information in the email)

J: If you use their terminology you know you are asking for the right thing

Was that useful?

L: Yes I did find that useful but I am not really used to using the search engine and I

think I need to practice a bit more
J: What do you find particularly difficult?
L: I think it is just getting used to knowing which, how to search properly, just knowing to it in I used it in the library just knowing which is going to offer you something that is more appropriate and I think I just need to use it more to be more confident with it.

J: Have you done a lot of Internet searching at college or not?
L: No

J: Did you use it last year?
L: No I didn’t use it at all. Actually I did use it in the library but not like lots I mean I like look up on different projects to look up certain things but not constantly.

J: Why was that?
L: I wasn’t really sure what to do.

OK fair enough, thanks.
Appendix 12: Respondent Profiles

Respondent L

In the RMA respondent L gave doing an Internet search a fairly high priority with a score of 5. She did not use wholesale fabric suppliers or trade associations. The observations and interviews showed that although she had used the Internet she was not very experienced at conducting searches. Respondent L displays a mixture of positive and negative attitudes towards computers and the Internet but her level of confidence is quite low.

Although she has access to a computer at home it is not connected to the Internet and she feels that she does not have enough time to sit and learn more about it. The training she received in the first year was her first experience of using the Internet and she is still fairly unconfident about using e-mail and other aspects of the Internet.

"I don't feel like I can say I'm going to send this e-mail. Even though I don't think it's complicated, but I feel I'm not quite sure. Even though I know it, I would like to be able to feel that I could just type it up and send it. But I still felt that I'm a bit rusty and I need a bit of fine-tuning, to just get confident enough to use the system."

Her lack of confidence seems to be based upon a lack of technical knowledge and fears about things going wrong, "it's like it's crashing and then it'll freeze, I'll just get nervy. I don't want to break it" and also insufficient exposure to the resource. She reports that she does not use the Internet socially and only goes online for specific targeted tasks.

Her confidence is further undermined by the feeling that she has insufficient knowledge about textiles "I don't feel that confident. I don't feel that I know enough about fabrics"

Despite her lack of confidence she is driven to find out more and improve her skills partly through a fear of being left behind.

"I used to just try and avoid them, but now I'm trying to embrace them...Because I feel like everyone else is, that you're not catching up with this whole Internet revolution."
L reports that she uses trade directories when applicable and also notes from other areas of the programme but she was not aware of many of the Internet sites that would have been useful to her. She uses percentage indicators from search engine results to help her identify useful resources but tends to stick to one or 2 search engines with which she is familiar for example Yahoo and Lycos. However, she relied upon the telephone rather than using e-mail to contact the suppliers, "I'm a bit nervous of e-mails and stuff. I've only done it once or twice." This lack of confidence appears to be linked not just to inexperience but also to the student's problems with literacy

*Sometimes I get more nervous when I think I have to write something for someone. Even if I could spell it normally, but the thought of having to type it, and them seeing my mistakes, makes me even more nervous.*

L could see the time saving advantages of using the Internet as a first port of call for information. "You can find out whether they have it or not, and then look for it somewhere else" but also expresses concern about the amount of time that a search can take because of the sheer volume of information available "You have so many options on it. You can be there for hours looking through them."

L sees the value of gaining more skills and identifies with the central role that computers now occupy in the industry.

Prior to the assignment she depended upon retail suppliers for sourcing fabrics "You don't really think that you're going to need to while you're still studying, unless you want something really exotic" but she was able to see the value in learning to contact wholesalers and the educational value in the exercise.

"I thought it was good, because it also gave you confidence, to speak to other people and try and sound professional and knowing what you want and try and get that across to someone else".

**Summary**

To summarise L's lack of confidence is compounded by a lack of experience and technical knowledge, problems with literacy and problems with developing efficient searching strategies to sift through the volume of information that overwhelms her. She also is unaware of the sites gateways and directories that will enable her to conduct more effective searches and feels that she has insufficient knowledge about textiles. Despite having access to a computer she feels that she does not have time to develop the skills and does not use her computer socially.

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Respondent D

Respondent D gave doing an Internet search a score of 7 in the RMA and visiting fashion sites that he knew a lower score of 15. The interviews revealed that these sites were mostly online magazines. He gave the Library I page a score of 5 but gave wholesale fabric suppliers and trade directories low scores at 28 and 27 respectively. The interviews revealed that he did use these resources but not consistently. D presents as extremely confident in his use of computers and the Internet with several years experience. Despite this he professes to prefer traditional methods for fabric sourcing. He has experience of using wholesalers for fabric sourcing and he uses trade directories and associations "I contacted Textile Institute" to support his research but sees the notes from lectures as a foundation to further research so tends not to use them. He expresses a frustration with the lack of quality of content on the Internet "I think it needs a lot of work, because it's still quite basic, most websites are still quite basic." whilst recognising its usefulness.

"It can be very educational. If you want to look at a designer web site, find out more, contact details and stuff, then it's all there you just type it in. There's a lot of nonsense on it too".

He uses e-mail extensively primarily for work rather than leisure and has his own website. The sites he visits tend to be magazines (e.g. Vogue) as opposed to those more specifically related to the industry although he has visited some of them including the Textile Institute site and Textile Web. He feels that he has quite a lot of knowledge about textiles, he would like to learn more but is confident enough to ask if there is something he is not sure of. He has used some advanced search options and is self taught. In the observation he was unable to find the information he was looking for on the Web and said that he would visit the shop instead.

He feels that he has sufficient knowledge about computers to deal with most technical problems that he encounters. He has a fairly positive attitude toward the Internet but feels that there is room for improvement

"I think the quality web sites need to advertise themselves more, be more attractive and fun, because education should be fun."

Summary

D is an extremely confident user of technology with several years experience, access to his own computer a sound technical knowledge and a good knowledge of textiles. He integrates research on the Internet when appropriate but also employs traditional methods and resources. His attitude toward the Internet is mostly positive with some reservations about the quality of the information available. He uses some of the tools available but not always effectively.

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Respondent G

In the RMA respondent G gave the Internet search a score of 11 the Library I page a 1 and wholesalers and trade directories a score of 8 each. This would indicate that she is using a range of useful resources. The Interviews and observation revealed that she was not using the Internet a lot and had some difficulties with searching. G has a basic working knowledge of computers and the Internet she has used it mostly for e-mail for social purposes. She does not have access to a computer at home but is able to visit her sister and use hers. Her sister seems to provide a lot of support. G quotes the price of printing off the Internet at college and the out of date equipment as barriers to using the college IT facilities for research. She has contacted and used wholesalers for fabrics but relies upon the lists given out by tutors rather than researching to find her own contacts and has not used the trade directories in the library.

She has some difficulty with wholesalers when she says that she is a student. She experiences difficulty with the terminology for fabrics and feels that she does not know a lot about fabrics. She has difficulty in selecting keywords for using the Internet.

Sometimes when I type, with English not being my first language, I don’t know how to say a short word to find something. It takes a long time when I don’t know. It never comes up the way I want. Something I don’t want comes up.

She says that she does revisit the notes from lectures in particular for IT. She feels that she does not know enough about computers and the Internet to feel totally confident in using them and is often thrown by the amount of information that a search produces.

There is a lot of information in there, but it takes a long time to download that. To be honest I don’t use it a lot.

Her attitude toward the Internet is positive but tempered by a feeling that she needs more training in order to be able to practice.

Learning more at college, if I’ve got a basic knowledge I can try to do it at home and have more confidence to use it.

She usually uses Yahoo for searches but will use alternatives if this does not produce the required results.

Summary

Although G has some experience of using the Internet she does not seem to use it often enough to begin to feel at ease with it. Not having access at home means
that she relies on her sister for support and is liable to forget things between sessions because she is unable to practice them. She does not perceive the college facilities as meeting her needs. She has difficulties with literacy, lack of technical knowledge and lack of knowledge about fabrics all of which contribute to her lack of confidence. She is not very independent in her research processes relying upon information supplied by tutors and support from others.

**Respondent M**

In the RMA respondent M indicated that she was not using the Internet, the library, page, trade directories or wholesale suppliers. The reasons for this became evident through the observations and interviews.

This student has fairly extensive experience using computers including a period of work experience where she was using the Internet as a research tool. "I had list of what I had to look at, the different addresses, so that was pretty straight forward." She also has access to a computer at home. These factors that should have had a positive effect upon her confidence with the medium are almost completely negated by the impact of her dyslexia. The dyslexia makes it difficult for her to use lecture notes and other resources that other students find helpful. She is unaware of the role of trade associations and has never contacted one. The text-based nature of the web also causes her problems. She has a computer at home with type talk but does not have Internet access and states that the computers at college are always busy. The thought of having to use a computer causes her extreme anxiety and she only uses a computer if she absolutely has to.

Searching is particularly difficult "I'm really not very good with anything that's written down. I don't take in what I read. I think that's because I'm dyslexic, so I don't do a search by reading things". She has a fairly good knowledge of textiles having studied textiles at A level. Although she has been provided with a computer with type talk to help with her dyslexia it has not solved her problems

*if there was a spelling mistake it would underline it in red and I wouldn't necessarily pick up on it, or I wouldn't know the correct spelling, even if it was listed*
She finds that having someone around to support her whilst working on the computer helps to reduce her anxiety. The design of web pages with strong colours and animation makes it even more difficult for her and there are some colour combinations and font styles that are particularly difficult for her to decipher.

Summary
Dyslexia is clearly the defining factor in this student’s lack of confidence with the medium. The level of anxiety that she reported when faced with having to use a computer is extremely high. Access to the Internet is also an issue because she does not have a connection at home and finds it causes her more anxiety having to use it at college when she cannot get support. Despite these difficulties she still expresses a desire to learn more and feel more confident but will probably require a lot of support in order to reach this goal.

Respondent H
The RMA indicated that respondent H did a lot of his research using fashion magazines and stores but he also gave visiting fashion related Internet sites a fairly high priority with a score of 6. However, he did not use trade directories and wholesale suppliers.

H has access to the Internet at home and uses it extensively for social purposes as well as work

I love the Internet. I haven’t come across any negative side. I visit a lot of sites. I’m very interested in music, so I look up a lot of bands, obviously fashion sites, cheap tickets for going home.

He used the Internet to source fabrics for his project and had quite a good response getting samples from half of the companies he contacted. Despite this success he still feels that he does not know enough about fabrics and not knowing the correct terminology caused him some problems “I was saying raw silk and they wanted the term dupion”, He has used trade directories but not extensively. Yahoo is his preferred search engine but he also uses Netscape and Lycos. He is able to use scan reading techniques to evaluate search results and advanced search techniques to narrow a search. He particularly likes the fact that some sites have images of the fabrics on offer. He has a good grasp of technical issues and uses technical terms e.g. re-boot. He spends a lot of time on the Internet and sometimes has problems remaining focussed and is easily side tracked.

This respondent is using the Internet fairly effectively as a research tool and is very successful in using it to source fabrics despite the fact that he feels that
his knowledge of textiles is limited. He employs a range of strategies and has a good level of understanding of how to conduct a search. However, the observations showed that he was not being as strategic in his searches as he could be and still had some gaps in his knowledge. He used a limited and fairly generic range of keywords. He has good access to the Internet and a lot of experience. He is clearly confident in his use of the media, English is not his first language but this does not seem to create huge problems for him.

Respondent F

In the RMA respondent F gave the Internet and fashion sites that she knew a high priority with scores of 7 and 3 however the observations and interviews showed that her search strategies were not as effective as they could be. This led to feelings of frustration with the technology and her lack of access to it. F does not have access to the Internet at home and finds this restricting.

"many times if I want to do some research, it's mainly in the evening, when the college is closed, when you're at home. That's why you're restricted." She also feels disadvantaged because she was not introduced to it earlier" Probably if I had more access to it earlier in my life, maybe I would be more used to using it. It's becoming more normal now, but it's a hassle sometimes to figure how it's working.

She will use trade directories when she feels it is useful but is not aware of trade associations or their purpose. She is able to employ some basic search strategies and is aware of advanced search functions but has problems using them. She uses notes from lectures and feels that she has a basic knowledge of textiles but that it could be more in depth. She tends to use Yahoo for searching but has also used Alta Vista. She dislikes the fact that a search can result in a huge amount of information but like the fact that the information is current. She would like to have a computer at home,

I would have time to see what to find, but because I don't it's a hassle.

Because of the access problems she has not used the Internet very often and forgets some of the processes she has covered at college. She would like more training.

Summary
The issue here seems not to be one of lack of confidence but more frustration with a lack of access and a lack of experience. She seems to have a grasp of the basics but needs to develop her knowledge in order to be able to employ strategies that will make her use of the technology more effective.
Appendix 13: The Textile Studio

This Internet based learning environment provides the learner with a one-stop shop for all the information they need to source textiles. The resource includes a search facility and context sensitive help. Users will be able to check their own understanding of the subject through the use of online assessments. The provision of dictionaries, glossaries and sample documents will enable them to access the correct terminology to undertake sourcing activities. The information will enable them to source textiles appropriate to the product group and season. The link to the library OPAC reinforces the use of traditional as well as E resources. The provision of trade show information prepares them for the transition to industry. The user is also provided with an address book to store their favourite contacts and a notebook, both of these facilities can be printed out. All documents are in Acrobat 6 which supports accessibility features that will enable dyslexic students and those with visual impairments to format the documents to their specific requirements. This resource provides the student with a supportive environment that enables them to undertake independent research whilst providing the appropriate scaffolding.

<Diagram showing various features of the Textile Studio such as lecture notes, trend information, supplier information, notebook, address book, quizzes, assignment briefs, sample letters/documents etc.>
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADCFTD</td>
<td>The Association of Degree Courses in Fashion and Textile Design</td>
</tr>
<tr>
<td>ARPANET</td>
<td>Advanced Research Project Agency Network</td>
</tr>
<tr>
<td>BFC</td>
<td>British Fashion Council</td>
</tr>
<tr>
<td>BTEC</td>
<td>Business and Technology Education Council</td>
</tr>
<tr>
<td>CADE</td>
<td>Computers in Art and Design Education</td>
</tr>
<tr>
<td>CBL</td>
<td>Computer Based Learning</td>
</tr>
<tr>
<td>CBT</td>
<td>Computer Based Training</td>
</tr>
<tr>
<td>CHEAD</td>
<td>Council for Higher Education in Art and Design</td>
</tr>
<tr>
<td>C&amp;IT</td>
<td>Communication and Information Technology</td>
</tr>
<tr>
<td>CMC</td>
<td>Computer Mediated Communication</td>
</tr>
<tr>
<td>CNAA</td>
<td>Council for National Academic Awards</td>
</tr>
<tr>
<td>CSCL</td>
<td>Computer Supported Collaborative Learning</td>
</tr>
<tr>
<td>CTGV</td>
<td>Cognition and Technology Group at Vanderbilt University</td>
</tr>
<tr>
<td>CTIAD</td>
<td>Computer in Teaching Initiative, Art and Design</td>
</tr>
<tr>
<td>CTI</td>
<td>Computers in Teaching Initiative</td>
</tr>
<tr>
<td>ELIA</td>
<td>European League of the Institute of the Arts</td>
</tr>
<tr>
<td>FTP</td>
<td>File Transfer Protocol</td>
</tr>
<tr>
<td>GLAD</td>
<td>The Group for Learning in Art and Design</td>
</tr>
<tr>
<td>GFW</td>
<td>Graduate Fashion Week</td>
</tr>
<tr>
<td>HEFCE</td>
<td>Higher education funding council</td>
</tr>
<tr>
<td>HND</td>
<td>Higher National Diploma</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
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<tr>
<td>---------</td>
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</tr>
<tr>
<td>HTML</td>
<td>Hypertext Mark Up Language</td>
</tr>
<tr>
<td>IBL</td>
<td>Internet based learning</td>
</tr>
<tr>
<td>IBT</td>
<td>Internet based training</td>
</tr>
<tr>
<td>ISD</td>
<td>Instructional systems design</td>
</tr>
<tr>
<td>IFAI</td>
<td>Industrial Fabrics Association INternational</td>
</tr>
<tr>
<td>IETF</td>
<td>Internet Engineering Task Force</td>
</tr>
<tr>
<td>NTIs</td>
<td>New Technology Institutes</td>
</tr>
<tr>
<td>IT</td>
<td>Information technology</td>
</tr>
<tr>
<td>IMLEs</td>
<td>Interactive multimedia learning environments (s)</td>
</tr>
<tr>
<td>LTSN</td>
<td>Learning and Teaching Support Network</td>
</tr>
<tr>
<td>RAE</td>
<td>Research Assessment Exercise</td>
</tr>
<tr>
<td>RCA</td>
<td>Royal College of Art</td>
</tr>
<tr>
<td>SMTP</td>
<td>Simple Mail Transfer Protocol</td>
</tr>
<tr>
<td>TERENA</td>
<td>Trans European Research and Education Networking Association</td>
</tr>
<tr>
<td>URL</td>
<td>Uniform Resource Locator</td>
</tr>
<tr>
<td>TLTP</td>
<td>Teaching and Learning Technology Project</td>
</tr>
<tr>
<td>TLTSN</td>
<td>Teaching and Learning Technology Support Network</td>
</tr>
<tr>
<td>VLE</td>
<td>Virtual Learning Environment</td>
</tr>
<tr>
<td>WWW</td>
<td>World Wide Web</td>
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</table>
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From Transmitted Knowledge to Constructed Knowledge: E Learning as Independent Inquiry

Julia Gaimster: London College of Fashion and Dr David E Gray: University of Surrey

Abstract

E-learning is maturing. Learning courseware delivered across the Internet (transmitted knowledge) is now only one of several components of e-learning. Not only does this lead to teacher-dominated forms of pedagogy, but also research suggests that many learners do not like it, preferring learning through face-to-face or other forms of contact.

Computer-mediated communication (negotiated knowledge) is becoming one of the newest learning paradigms. It is more student-centred, and allows for a more democratic engagement between tutors and learners in a peer group, learning environment. But the exponential growth of the web, now the depository of the largest database of information known to humankind, is now posing the potential for new forms of learning (constructed knowledge) through research and independent inquiry.

This paper reports on a small-scale study in which a group of students were actively taught web searching and research skills. The results show not only the potential of the web for independent learning, but also some of the current problems associated with using the medium in this way. The paper points to the future of e-learning and the use of computer mediated communication in conjunction with knowledge management tools and systems.

The Rationale for the Study

The motivation for the study arose from the changes that have been occurring in both education the subject context of the study, and the fashion industry. In the fashion industry, for example, production and sourcing methods have changed dramatically with the introduction of computer based UK technology (Colussy, 2000). These changes needed to be reflected within fashion curriculum. The reductions in the time available for contact teaching and an accompanying shift in emphasis from teaching to learning (Barr & Tagg, 1995; Forsyth, 1998) were further drivers for change in the content and delivery of the curriculum. These changes in the delivery of the curriculum meant that the student body was expected to spend an increasing amount of their time in self-directed study and utilising open access facilities. There has been no systematic research into how effectively fashion students have been dealing with this change in study patterns or which resources are most useful to them. It became evident that there were a substantial number of students
who struggled with this new emphasis on independent study. The Internet was identified as a tool that had the potential to assist students with these new more flexible approaches to learning because the learner can choose the time, the place and the pace at which they study (Fayter, 1998). In a sense, then, the function and facilities offered by the web include:

The transmission of knowledge (e.g., e-learning programs)
Negotiated knowledge (e.g. listservs and discussion forums)
Harvested knowledge (the web as a large depository of knowledge, data and information).

But the balance between these may be shifting away from the passive transmission of knowledge, to more learner-centred, dynamic and interactive forms of knowledge (see Figure 1). In other words, e-learning may be moving away from the transmission of didactic, teacher-centred courseware (learning materials) to the use of computer mediated communication using, for example, discussion forums, listservs and newsgroups (negotiated learning). The exponential growth of the web also allows for (independent) learners to search the vast depositories of web pages, archives and on-line databases (harvested knowledge).

![Figure 1: From transmitted to negotiated and harvested knowledge](image)

Certainly, the speed at which the technology is changing also makes it important for learners to be able to "learn to adapt to new technologies without continual intensive training" (Phelps, Ellis, & Hase, 2001, p 482). It is argued (Owston, 1997) that the Web is a useful tool in moving from teaching to learning and broadening access but many students seem not to be taking advantage of, or have been put off using, the technology that we are striving to make more available to them (Jeffries & Hussain, 1998; Selwyn, Marriott, & Marriott, 2000).

This study set out to identify whether the Internet was a useful tool to enable fashion students to engage in independent research with a specific focus.
upon fabric sourcing – harvesting knowledge (of textiles) using the Internet. Given that the students were given tuition in how to search the web, the study also sought to address the question of whether “harvesting” skills on the Web can be taught to an adequate functional level.

**Theoretical Model**
The study looked at both instruction and constructivist approaches to computer based learning. Whilst the instructional approach seemed to be appropriate for didactic approaches to the transfer of knowledge it was considered to be of limited relevance in the context of this study. Constructivist theories take a student centred approach and are generally considered to be most effective in authentic environments and activities. As this study was simulating an authentic activity, undertaken by professionals in the fashion and textile industry, a constructivist approach was applied to the design of the teaching and learning in the taught sessions. Students were provided with the appropriate scaffolding to enable them to move from their existing knowledge in order to develop new skills. This supported approach is advocated by Vygotsky (1962; Vygotsky 1978) in his theory of the zone of proximal development.

**The Methodology**
The vehicle for the study was an assignment that had been set for the Year Two students on the Higher National Diploma in Fashion Design and Technology at the London College of Fashion in July 1999. As part of this assignment the students had to source a range of textiles. During the assignment the students were introduced to a range of Internet research skills via a series of three practical workshops. The study was in four stages and a variety of research tools were selected to meet the aims of the study and offer multiple means of data collection. This would enable triangulation of the data and increase the reliability and validity of the study. This triangulation was intended to add complexity to the data and to “reveal different facets of the data (Coffey & Atkinson, 1996 p.15). The four stages of the study were:

**Stage 1 Research Methods Activity**
Nineteen Respondents were asked to identify and put in order of priority the research resources that they usually used when researching for a design project.

**Stage 2 Observations**
Eleven respondents from the initial group were observed using the Internet to try and source textiles for their assignment.

**Stage 3 Interviews**
Six respondents who had been observed were interviewed using a semi-
structured approach.

Stage 4 Follow up study
Two years after the initial study a sample of four students at the same stage in their programme were observed undertaking the same sourcing activity. The purpose of this stage of the study was to identify whether, despite the speed of change in the technology, the themes identified in the initial study remained relevant. The researcher also used the experience of delivering the sessions to gain an insight into what some of the key issues might be for students using the technology as a research tool. This experience also highlighted some of the issues that lecturers trying to integrate the Internet into their teaching would need to consider. This experience also informed the design of the research tools in stages two and three of the study. Table 1 illustrates how the tools used related to the aims of the study.

Table 1: The relationship between the aims of the study and the research tools.

<table>
<thead>
<tr>
<th>Objectives</th>
<th>RMA</th>
<th>Observations</th>
<th>Interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 To examine the ways in which the students interact with the Internet/WWW.</td>
<td></td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>2 To determine their levels of confidence and ability in using the media</td>
<td></td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>3 To analyse the students' ability to apply appropriate strategies for independent learning using the Internet.</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>4 To investigate whether Web research skills can be taught.</td>
<td></td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>
Results

The study revealed six main themes) each of which is presented in more
detail below. In order to preserve anonymity, letters of the alphabet replace
the names of respondents.

- Knowledge and skills
- Experience
- Strategies
- Confidence
- Attitudes
- Access.

Knowledge and skills

Themes that arose from the data showed that there were several areas in
which the respondents had knowledge gaps. These were knowledge of:
Computers and the associated technical knowledge necessary to use them
effectively.
The Internet including, tools for searching and navigation and sites of
interest.
Subject specific knowledge, relating to fabric sourcing and textile terminology.

Knowledge of Computers and associated technical skills

The observations indicated that some of the respondents lacked basic
computer skills including in three cases how to control a mouse or use a
keyboard. Throughout the observations the computers frequently crashed
and Netscape performed "illegal operations". Some of the respondents
did not know how to escape from a crash while others did not have basic
file management skills or did not understand how to save and retrieve
documents.

Internet Knowledge

Coupled with a lack of technical knowledge about computers there was
a lack of knowledge about the Internet, how it functioned, and the tools
available to help them to find appropriate information. Even though the
taught classes covered the use of bookmarks, some of the respondents did
not know how to use them. Respondent M struggled with how to get into the
computer network and how to send emails.
Q: Having done that [sent an email to a supplier] once would you feel confident to do it again?
A: I don’t know. No I don’t think so.
Q: And why would that be?
A: Because I wouldn’t know how to get into the system.

(Respondent M)
One respondent (M) also had major problems with navigation and did not know how to use the back button to return to the previous page. Two respondents (S & J) did not understand how to use links to navigate. They also had problems with using Boolean logic to refine their searches and four were unable to identify from the URL what kind of site they were linking to. Although the taught sessions included them, none of the respondents went to a relevant gateway or the London Institute’s Library home page (http://www.linst.ac.uk/library) to start their search. All of the respondents went directly to a search engine that they usually used or one of the search engines demonstrated in the class. Three respondents (Q, G & J) also had problems with creating folders and two (M & F) had difficulties sending an email.

Knowledge Gaps Textiles
The respondents used a very limited range of terminology in their searches. They were often unaware of trade names or companies that may have been useful keywords to use. They did not seem to be aware of textile trade associations or organisations that might have been good starting points for a search. This lack of awareness of resources was evident in the data from the Research Methods Activity which showed that Trade associations and CD ROMs were not used by 58% of the respondents; wholesale fabric suppliers and trade directories were not used by 44% of respondents. The respondents did not seem to have planned in advance which keywords may be useful and tended to use generic terms such as “fabrics” and “textiles”. The use of generic terms usually resulted in a large number of “hits”, many of which were not relevant to the type of information being sought.

This caused difficulties because they were uncertain of the terminology to enter as keywords when conducting a search. It also made some of them unconfident about communicating with suppliers and reluctant to send email requests for fabric swatches because they were unsure how to ask for them. Some of the least confident users had knowledge gaps in all three areas. It is perhaps unsurprising that this connection exists for some of the users. Many learning theories accept that learners need to build upon existing knowledge in order to be able to develop higher order problem solving and metacognitive skills. Without this basic level of knowledge, the computer can
become a barrier to the learning activity instead of a tool to facilitate it. This is true of both the Instructional and Constructivist approaches to the use of technology in learning and teaching.

Experience
The students with the least experience were also the least confident and the least knowledgeable about computers and the Internet. However, experience in itself did not necessarily lead to either confidence or a more strategic approach to searching. A lack of experience was also closely linked to a lack of access.

The issues relating to experience fell into two categories:

- Experience with computers and the Internet.
- Experience in dealing with wholesale (textile) suppliers.

A lack of experience was often accompanied by a lack of technical knowledge.

The ability of an individual to access the computer and spend time building confidence and gaining knowledge seems to be a key factor in their attitude to the media. The most experienced users with access to their own computers displayed the most positive attitudes, (Respondents H&D).

Strategies
The respondents did not evidence a strategic approach to the way that they searched nor to information seeking generally. The interviews supported the themes identified in the observations. There were varieties of strategies that the respondents employed for dealing with different aspects of the task. These have been broken down into strategies relating to searching, technical issues and issues relating to fabric sourcing.

Searching Strategies
Respondents employed a range of strategies to search the Internet and make choices about the sites to go to. These strategies varied in their effectiveness and in some cases the complete lack of knowledge about how the Internet works led students to employ ineffective strategies. This could be why they felt so overwhelmed with the amount of content on the Internet. The most confident and experienced respondents employed the most effective strategies.

Respondents tended to stick to between one and three search engines with which they were familiar. Four of the respondents cited Yahoo, which was the most popular search engine. Reasons given were: friends recommended it, they knew the address, it was easy to use, and that they were familiar with
There was overall a lack of strategy in the respondents' approach to searching and to their selection of tools for searching. This lack of a strategic approach was partly due to a lack of knowledge about gateways, directories, advanced search techniques, image searches and fashion and textile related sites on the Internet. One of the respondents (D) was very experienced and confident but still did not demonstrate a strategic approach or an extended knowledge of search engines, advanced search techniques or sites that may be useful. This indicates that experience with the Internet in itself does not necessarily lead to the use of effective search strategies.

The majority of the respondents have experienced some problems of a technical nature. The strategies they employ to deal with this seem to be instinctive rather than based upon an understanding of the nature of the problem. Respondent H was familiar with some technical terminology and seemed to be aware that running several applications or having many windows open may be part of the problem. Generally, they felt ill equipped to deal with technical issues. One of the strategies they employed to deal with this was to consult a friend or relative who was more knowledgeable. This collaborative approach to problem solving was also apparent in the taught sessions. Some of them felt that they needed more training or more IT classes to help them feel confident in their use of computers.

Fabric sourcing strategies
The Research Methods Activity showed that the range of resources that students were using for textile sourcing was limited and that they did not tend to use wholesale suppliers or trade directories and associations. The observations verified this, however by the interview stage (after the taught sessions) the majority of the respondents had tried to contact wholesale suppliers to order textiles for their final major project. This was not always easy nor did it necessarily lead to a successful outcome. Even though they did not all use the Internet to source their textiles they saw the value of being introduced to wholesale suppliers and had found the sessions useful in helping them to develop their Internet skills although they felt that the number of sessions was not sufficient.

Confidence
Respondents' levels of confidence when using the technology varied from extreme confidence to extreme anxiety. The data from the observations and interviews indicated that the least confident users were often those with little experience of using the Internet and limited access to it. Many factors seemed to have an impact upon levels of confidence. These included problems with spelling and severe dyslexia. A lack of confidence in their literacy skills made students nervous, and sometimes extremely anxious, about using the web. Literacy issues affected some of the students for whom
English was not a first language but not all of them. The level to which it affected them seemed to depend upon their level of ability in English and their ability to employ other resources to help them (dictionaries, English friends).

Students for whom English was a first language also faced difficulties caused either by a lack of confidence in their use of spelling and grammar or in the case of respondent M, because of her dyslexia.

The problem is I'm not very good with anything that's written down.

I don't take in what I read. I think that's because I'm dyslexic, so I don't do a search by reading things. (Respondent M)

The respondents recognised the role that computers and the Internet could play in research as well as in their future professional lives. However, they had reservations about the time it took to learn the appropriate skills and to find the information that they were looking for. Some of the respondents felt overwhelmed by the volume of information offered on the Internet and felt ill equipped to analyse and evaluate it.

Access

Access to the technology and the resources to use it effectively had a clear impact upon the level of experience of the user. Generally, the students who had no access outside of college were the least experienced users and were often the least confident. They also had the most limited knowledge of computers, the Internet and search tools.

Some of the respondents clearly felt that not having access at home to a computer with an Internet connection was a disadvantage. They were not always able to access a computer at college at a time that was convenient to them.

It's mainly in the evening when the college is closed, when you are at home.

That's why you're restricted.

(Respondent F)

I don't have access to email at home- I don't like coming into college, into the library to do it. Someone's always on it. (Respondent M)
External factors

In addition to these skills and areas of knowledge there are certain external factors relating to the media that need to addressing in order for the student to be successful. These external factors include access to a stable network and the appropriate software and hardware, the level of technical support that is available and the accessibility of the equipment at times that are convenient for the learners. The location of the facilities and the arrangement of the rooms to allow collaborative learning also need consideration. One of the biggest external barriers was the attitude of suppliers toward students. The Internet provides an excellent medium for students to engage with experts and professionals but this opportunity for the textile industry to engage with and encourage the next generation of designers will be lost if they do not develop a more supportive response.

Summary

The data from the main study reveal that the respondents were not using a strategic approach to their searching. They generally lacked confidence and experience in the use of computers and were not making use of functions that could speed up or simplify the search process for them. Most were not transferring or consulting information that had already been covered in the taught sessions or in other parts of the course. This meant that the majority of the respondents were not working effectively and were taking much longer than necessary to find relevant information. These results are consistent with results from other studies that have examined the information seeking strategies of novice users of electronic information systems (Marchionini 1995).

Results: Follow Up Study

The follow up study identified that all of the themes in the initial study were still valid. The most significant change was not in the skills and abilities of the students but in the ways in which the Internet had developed. One of the most interesting aspects of the follow up study was that it indicated that the designers of search engines were constantly modifying the services on offer in order to help users to overcome some of the more common problems that they encountered. These include improvements in spell checking services, phrase matching and the development and expansion of translation services (Sullivan, 2001a, Google, 2002b). The size of search engine indexes is also constantly growing. For example in June 2000 Google indexed 250 million pages, but by December 2001 it had indexed a record 1.5 billion documents (Sullivan, 2001b). This has potential advantages and disadvantages. On one hand a search engine with a large index is more likely to include the information that a user is looking for especially when they are searching for an obscure term. On the other hand when a user is using a broad or popular
term it may generate more hits resulting in information overload (Sullivan, 2001 b).

One significant change in the respondents was the level to which those who had their own computers and access to the Internet had become almost totally reliant upon this for their research. They used the Internet even when it may not have been the most appropriate source of the information that they were seeking and it took them much longer to find the information this way than it would have done using traditional resources. There is a danger that these “Internet Dependent” students will be narrowing rather than expanding their range of references through their use of the medium.

Discussion

The study has highlighted the wide range of problems the students faced whilst trying to use the medium. Some of these problems were of a technical nature; the instability of the network was a particular issue and led to some students becoming very frustrated with the technology. There are other studies that have identified similar issues. Williams (2002) found that students complained about networking problems which restricted their access to their website. Hara and Kling (1999) and Felix (2001) also cited technical problems as a barrier to learning using technology.

Although these technical problems clearly affected some of the respondents the majority of the problems that they faced were due to gaps in their knowledge or a lack of effective information seeking and evaluation strategies. The sheer volume of information available on the WWW was seen as both an advantage and disadvantage and some of the respondents were clearly overwhelmed by the amount of data available.

There were very few instances observed where the respondents made use of other tools that could have assisted them for example; the history button, book marking facilities or advance search options. Even when they were aware of these facilities they had rarely considered using them preferring instead to wander deeper into a trail of links or keep returning to a list of hits from a search. Their knowledge of sites and organisations on the WWW that were specific to fashion and textiles was extremely limited and reflected their use of physical resources in the college library. This lack of familiarity with the WWW was often linked to a lack of experience and access particularly for those students who had very limited prior experience and did not have their own computer. However, it has to be noted that not even the most experienced users were using these functions to their full advantage. Experience with computers in itself it seems, does not necessarily lead to effective information seeking, Lazonder (2000) also this.

If we are expecting our students to engage in more self-directed study and
resource based learning then we have a duty to ensure that they have the appropriate skills in place to enable them to adapt to this mode of learning. In order to be able to function effectively as independent learners they will need to develop confidence and expertise in information seeking and evaluation and to be able to transfer and apply these skills in an increasingly complex environment. Clearly for many students a basic IT induction is insufficient for their needs.

Phelps et al (2001) recognise the need for learners to be able to adapt to the continuing changes in software and that this requires capability with computers as opposed to competence in a specific programme or environment. This capability is achieved they say though hands on experience, regular practice and reflection on the part of the learner. They claim that computer capability is “much more to do with an approach to learning and working than simply a set of technological skills.” (Phelps et al., 2001 p.483). In order to facilitate the acquisition of this capability learners will require access to the appropriate facilities at a time and location that meets their needs. Providing this level of access is one of the biggest challenges for higher education providers, but it cannot be ignored if we are really committed to developing effective independent learners who are able to take advantage of all the resources available to them.

References


