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This paper will seek to evaluate the effectiveness of a range of learning and teaching technologies currently available to art and design educators in British Higher Education.

The Use of Technology in Adult Art and Design Education.

The 'technological revolution' of recent years has yielded a range of new tools and materials that can be used to assist teaching and learning in adult art and design education.

It has been widely presumed that these tools would promote the practice of students' 'self-directed learning', thus saving money for financially overstretched Universities, and helping educators to cope with the stresses of increased student numbers, and the demands of widening participation.

Research shows that this is not always the case, however.

By drawing upon the experience of a number of educators in several UK Universities and Colleges, this paper seeks to evaluate how effective are computer-related tools in teaching and learning art and design, how efficiently they are currently being used to enhance art and design education in Britain, and why a backlash in the use of ICT is currently being experienced in some UK art and design education establishments.

"What was it that turned my initial enthusiasm into a sense of boredom, frustration and disengagement, surely the three deadly sins of the learning process? It can be summed up in one word: PowerPoint, the favoured tool of presentation for the unimaginative."

(Tom Ward (the name of the author has been changed): "I watched in dumb horror", Guardian Education, Tuesday May 20, 2003)

The "technological revolution" has presented educators with a range of new tools that, alongside traditional teaching methods, can be employed in the communication of visual ideas to fashion and textile design students.

Although the drive to harness the economy, power, speed, and global reach of computer communications is understandable, it is important that the differing technologies available are assessed objectively for what they can offer in terms of education, and are used to optimise the teaching and learning process, rather than being seized and used as "technology for technology's sake".

This paper explores the range of communication tools available to educators, evaluates their effectiveness in communicating visual ideas to fashion and textile design students, and seeks to explore why a backlash in the use of ICT is currently being experienced in fashion and textile design pedagogy.

Simply put, communication is the process by which messages are sent and received. It is a universal, essential process that encompasses an enormous range of methods including

reading, writing, talking, listening, graphics and non-verbal behaviours.

Visual Communication

One picture is worth a thousand words.

(Fred R. Barnard: "Printers' Ink", 10 March 1927, p. 114.)

(Note: Fred R. Barnard described this statement as "a Chinese proverb, so that people would take it seriously." It was immediately credited to Confucius.)

The use of visual communication in design pedagogy

The ability to communicate well is one of the most fundamental skills required by any educator.

The specific task of an HE lecturer in design subjects is to communicate the design process to design students.

In the context of any design department, much of the communication that takes place between staff and students is visual in nature. Given that the visual appearance of design products is of paramount importance, it is perhaps inevitable that visual imagery is used to teach the process.

My students respond far more readily to images than the written word. It is far easier to get their attention by showing them pictures or samples than by giving them something to read. They are artistic people who are enrolled on a design course because they are instinctively interested in visual communication - whether they realise it or not!

Design students and professionals are sophisticated in their instinctive use of visual literacy. Visual clues are picked up and processed instantaneously with hardly any conscious thought.

In order to teach effectively, it is important to acknowledge that students tend to operate more readily in their "comfort zone" and that students will therefore more readily engage with the learning process if they are comfortable with it.

Given that visual communication is more "user friendly" to visually-orientated people, it makes sense to exploit visual methods of communication when teaching design students.

Given that design students in general respond better to visual material, they are much more likely to access learning materials that are visual in nature, and having done so, derive more meaning and use from them. It is perhaps necessary to exploit this tendency in the provision of visual communication tools to aid the learning process.

Visual communication in design education relates to two separate (discrete) areas. As well as using visual communication tools to communicate visual design ideas to students, design educators also teach the art of visual communication to our students to enable them to communicate their own design ideas effectively to others.

Traditional visual resources used for teaching fashion and textile design students include:

Slide projectors / overhead projectors

Blackboard and chalk / whiteboard and markers

Examples / pictures of students' work, and the work of art and design professionals

Magazines / magazine cuttings

Samples
Video

- however following the 'technological revolution' of recent years, a great many more teaching and learning tools have become available to educators and students.

Visual Communication Tools

“Human use of computing is vast and growing. Networked technologies such as the Internet and the World Wide Web have been called ‘transformational’ because of their wide-ranging impact. Electronic networking creates communications across terrestrial boundaries, across cultures and on a global scale. Concepts of space and time are changing, and of how and with whom people can collaborate, discover communities, explore resources and ideas and *learn*.”

(Gilly Salmon: “E-moderating: the key to teaching and learning online”, February 2000:
<http://www.atimod.com/e-moderating/extracts.htm>)

Although there are an enormous range of communication tools that have become available in recent years by the advent of the Internet and related technologies (examples include: e-mail, mobile telephone technology, newsgroups, mailing lists and discussion boards), most of these are text-based and the range of visual communication tools available to the design educator are relatively few.

A great many ‘good in theory’ arguments exist for purchasing and regularly updating the latest educational software and equipment, however most of these are presented by those marketing the tools, rather than educators and students themselves.

Here I will attempt to identify the technology-based tools that do exist, and evaluate their effectiveness in communicating visual ideas to design students. This evaluation is taken specifically from an educators’ perspective, from the experiences of my own working practice and those of my colleagues and students.

An evaluation of the teaching and learning tools that have been provided by the ‘technological revolution’ is worthwhile in order to investigate whether technology can help lecturers to either improve their teaching practice, or make life easier .

As student numbers increase per head of staff, and educational budgets become increasingly strained, traditional teaching methods are becoming less effective. Lecturers attempting to maintain the quality of traditional delivery to larger student numbers are either failing to do so, or else are becoming increasingly stressed and exhausted in the attempt to maintain the quality and breadth of delivery.

At the same time, the student cohort is changing. ‘Widening participation’ means that the traditional British HE design student demographic of “white, British, 18-25, middle class” is changing, and a greater range of learners (e.g. mature students, part-time learners, students from less affluent backgrounds and overseas students), need to be catered for.

In addition, advances in pedagogic theory and developing understanding of the learning process suggest that adult learners make the most progress when they take an active role in the learning process.

As a result of all these factors, the concept of “self-directed learning” - with lecturers taking the role of “facilitators and collaborators” in the learning process, rather than “teachers” of profound wisdom - is increasingly considered to be the way forward in education.

Further, the design industries themselves are changing, with computer -based technology

playing a greater part in both the design and manufacturing processes. As educators, we have a duty to prepare students for employment, and in light of this, it is necessary for design students to be aware of, and familiar with, the technologies that they will encounter in a working environment.

Also need to prepare students for participation in the “global economy” – especially where students are located in remote areas.

“We need computers to prepare students to participate in the global economy, as we are so isolated we have to look at business possibilities for our students from other perspectives.”

(Sandy Heffernan...New Zealand)

A very good point!! On a smaller scale, this point is also relevant to Liverpool. Although we are in a Country that has an extremely good reputation for fashion, in the North we are still largely “cut off” from the centre of fashion, London. Many fashion professionals simply will not make the trip to the North of England, and some companies are unwilling to take on Northern students for work placements, in case accommodation becomes a problem. The situation improves gradually with better communication – and faster trains!!

It is clear that teaching methods need to change, and it is possible that technology can offer solutions to how this change should take place. To what extent can we apply technological solutions to practical pedagogical problems?

Evaluation of a range of Visual Communication Tools available to educators in art and design subjects.

Digital projectors / ‘PowerPoint’ software

“What was it that turned my initial enthusiasm into a sense of boredom, frustration and disengagement, surely the three deadly sins of the learning process? It can be summed up in one word: PowerPoint, the favoured tool of presentation for the unimaginative.”

(Tom Ward (the name of the author has been changed): “I watched in dumb horror”, Guardian Education, Tuesday May 20, 2003)

Timo Rissanen (University of Technology, Sydney)

Giving: A well-edited Powerpoint is an aide for a presentation; I don't think a presentation (lecture, conference etc.) should ever rely on it fully. I always try to imagine the computer not working (and sometimes it has happened) and giving the presentation without it. I find Powerpoint most helpful in communicating visuals; I have made the mistake of putting too much text into a presentation. As a result you lose part of the audience's interest completely and the rest slavishly copy my notes word for word, without understanding much.

Hilary Carlisle (Edinburgh College of Art):

Are as good or bad as the person who writes and delivers them. They are a fantastic tool for teaching when used appropriately and not exclusively. Image quality never looks as good as old fashioned slides though....

Clare Hussey (Northumbria University):

I think PowerPoint is very useful, but also fairly dangerous/risky/challenging for those who are not competent in using it, perhaps more formal training should be given.

Digital projectors and PowerPoint software have superseded slide projectors and overhead projectors in most educational establishments.

Generally, their function is the same - to present images to a large audience at the same time.

Unlike the old slide projectors and overhead projectors, however, 'PowerPoint' and other digitally-projected presentations can link a number of different formats, incorporating text, pictures, sound and video into a presentation which, in theory at least, means that presentations can be both exciting and interesting.

In practice, however, presentations are often far from 'exciting', or even 'interesting'. Far too many PowerPoint presentations are over-long, over-complicated, and as a result, extremely dull. Too often the content of the presentation is secondary to the design of the presentation, which appears to be aimed predominantly at demonstrating the presenter's skill at using PowerPoint functions, and has little or nothing to do with effective communication:

“The funniest (as well as the most tragic) experience was a conference where the speaker had 15 minutes, and he had 42 slides full of text, which he proceeded to read out. He got cut off at slide 19. I guess the fact that I cannot remember the topic but can remember the figures says it all.”

(Timo Rissanen, (University of Technology, Sydney)

As a result, “death by PowerPoint” - being bored rigid by tedious PowerPoint presentations - is a phenomenon that many students are familiar with. In order to investigate how prevalent is this hatred of PowerPoint, I typed the words “death by PowerPoint” into a search engine. A staggering 1,750,000 results came up!

The principal limitation of PowerPoint as a learning resource is that it is entirely reliant on the communication skills of the presenter. The audience, or 'receivers' of the intended message, usually take only a passive role in the communication exchange, meaning that it is far too easy for them to “switch off” and not engage in receiving the message at all.

In addition, current pedagogic thinking suggests that adult learners need to engage actively in the learning process, if optimum learning is to take place. According to Biggs (1989), activity is one of the four features associated with encouraging a “deep” approach to learning:

“Deep learning is associated with activity. Students are more likely to make connections between what is being learned and past learning if they are active rather than passive.”

The essentially passive role of the student in a PowerPoint presentation means that as a learning resource, PowerPoint is fatally flawed.

Thus, unless great care is taken with the content and format of the presentation, a tool that is intended to be a more effective means of communication than traditional projectors can result in educators communicating LESS effectively!

“Three years ago I completely immersed myself in Powerpoint. All of my lectures were on Powerpoint, I used all the flash fly ins and dissolve outs, and I thought the students would be impressed. Not so. I received the worst evaluations ever -

comments like 'a pity she doesn't care as much about the content as the technology' ”

(Louise Duvernet MScS EEd, Australian Catholic University, Australia.)

Louise again: “The lesson was that we need to use the software to enhance communication. ... Software is only a tool for communication, no better or worse than any other that is used effectively. The only technology I use for my lectures is an OHP”.

VLEs (Virtual Learning Environments)

Timo Rissanen (University of Technology, Sydney)

“There has been some push at my university, and others in Australia, to introduce VLEs, to combat increasing student numbers without increasing staff. In fashion design luckily this hasn't had any detrimental effects in my experience; rather, it's a complimentary tool.

“I've only used it as a voluntary 'add-on' in the courses that I teach. The course documents are available to anyone who might have lost them, and I also put up related research material that a tiny minority of students ever looks at, I think. I believe there was an attempt to make Blackboard a compulsory part of one subject, but for reasons unknown to me, this died up the arse, to use a beautiful Australian piece of poetry.”

Hilary Carlisle (Edinburgh College of Art):

Very useful for disseminating information and giving students a focal point for finding information but require time and effort to keep them up to date otherwise they become worse than useless very quickly.

Clare Hussey Northumbria University):

Personally I have had a good experience with this type of electronic facility, but at the end of the day there is a great deal of commitment required on behalf of the staff to ensure their provision is up to date, and what with all their other responsibilities, this can often slip!

Virtual learning environments, or VLEs, allow for course related materials, as well as communication, assessment, and administration tools to be provided and used within a single environment via the web browser. Access to the learning environment is restricted by username and password and will typically be organised by programme or module. Most institutions are currently supporting and using one or more systems, and some have developed their own. The market leaders in higher education at present are Blackboard and WebCT.

The aim of VLEs is to support learning and teaching activities across the internet.

In terms of communication, VLEs enable students to access visual imagery (as well as text-based materials) supplied by lecturers and each other, within the “virtual classroom” of the VLE, e.g. drawings, scanned samples, photographs and video clips, and links to other web resources.

VLE communication can work in two ways: visual ideas can be communicated to students by lecturers and other students, and visual ideas can be communicated by students to lecturers and other students.

Students can display their work for critique, critique each others' work, and engage in collaborative work without having to be in the same place at the same time.

The intention is that a VLE becomes a “virtual classroom”, where students can learn at any time, anywhere, according to what is convenient and timely for the student. This concept enables them to learn at their own pace, rather than at the pace dictated by the tutor, or the rest of the group, and direct their own route through the materials available, according to personal preference and method of working.

Design students in general are encouraged to take responsibility for their own learning, in order to encourage individuality in their work. Self-directed research is a usual starting point for design - based projects. VLEs support the concepts of student-centred learning, and self-directed learning.

Once again, however, the theory and practice of using VLEs appear to be very different.

Of my group of 28 second year fashion and textile design students (at Liverpool John Moores University), not one student was able to tell me what a VLE is. Worse still, several members of staff did not know either.

Although many (staff and students) had heard of ‘Blackboard’, and were aware that it existed as part of CWIS, the JMU Intranet, only one student had accessed her modules on the system, and reported that all she found were copies of the module handbook. Clearly the resource is being underused!

It seems this experience is not uncommon:

“The impact of technology has meant that it is possible to offer students access to a range of resources that enable them to engage in self-directed study in textile technology. The problem is that students and educators are not always aware of them or encouraged to use them.”

(Gaimster, Dr. Julia, and Sinclair, Rose: “Fashioning Our Future: Education in Fashion and Textiles in the UK”. London College of Fashion, Goldsmiths College, 2004.)

In order for VLEs to be effective learning tools, it is necessary to educate both staff and students in their use, and for learning materials to be updated regularly.

For flexibility of access, which is essential to facilitate student-centred learning and self-directed learning, students also need to have access to a computer and the Internet, which many do not, outside of the University environment.

“– this only works if students have access at home, not all students have access to a PC when they go home in the evening. We need to think how the information can be used and accessed and what do the students need to access”

(Rose Sinclair)

Further, this type of learning relies upon the students’ willingness to access the resource. Experience among educators shows it is likely that the kind of students who access the VLE are the stronger, more motivated students who are already actively engaged in the learning process, whereas weaker students, who stand to benefit most from the additional learning materials available are less likely to access the VLE. Learning materials have no value at all unless they are being accessed!

The Internet

The advent of the Internet has meant that there is a vast and ever-changing wealth of information to those with access to a computer and Internet connection. Unlike books, Internet-based information is usually (although not always) up-to-date, meaning that students can keep abreast of current thinking: this is particularly important in the rapidly-changing worlds of fashion and textile design.

This resource can be used to communicate a vast wealth of information, including visual ideas, to design students. Images can be found readily by 'surfing' the Internet or by conducting directed searches, and these images can be readily saved, manipulated or printed, according to the individual requirements of the student.

Online visual resources, such as tutorials (e.g. "Garment Construction: an introduction to basic blocks, pattern cutting and garment construction" (<http://www.arts.ac.uk/learning/garment/findex.htm>) can be accessed and used via the Internet, and subject-specific sites abound (e.g. www.wgsn.edu.com) that provide visual information about trends, exhibitions, industry news, and so on.

E-galleries - I must admit that this is one tool that I had not, until recent communication with Nottingham Trent University, considered as a teaching and learning tool. My experience of e-galleries to date had always been in their capacity as a purely promotional tool, for graduates and other artists to promote their work.

"Welcome to Virtual Studio 1.

Working on a computer can be very isolating and, unlike a conventional studio setting, you do not get many chances to see and discuss each other's work. The virtual studio is a space for your digital images and ideas. You can add as many images as you want, but the minimum is 4 per module (1 from each CAD workshop). Each image should be accompanied by some visual analysis.

You can look at each other's work, be inspired by it, and make comments or suggestions by clicking 'read and add comments'. Comments will be emailed to the student who placed the image and be added to the comments section, enabling a wider dialogue. Be constructive – nothing hurtful or offensive please."

(Opening message, NTU e-gallery, Nottingham Trent University, UK)

Frank Abbot -

"Very much a teaching and learning tool.

"We think of it more like an extension of the studio or a mental gymnasium where the students can exercise their ideas in a semi public way restricted to being seen only by staff and other course members.

"The reason they (students) would be motivated to higher levels of achievement would be in order to get more attention for their work. Since the gallery is not chosen or curated, they can put whatever they like up, so new strategies for attracting viewers and engaging interest have to be taken on board in order to be seen in what is a massive collection of images / sounds / videos and web sites.

(on maintenance:) **"I am afraid it is an additional task taken on by a few members of staff along with all their other tasks.**

"However, since the gallery is not managed or curated, then it is virtually self-managing and carries on whether the staff view it or not. This may be something to do with digital media still being marginal, and for some students the e-gallery becomes a space for them to operate and find a voice without having to deal with any "academic" regime of criticism or surveillance happening. I think that the discussions stimulated by work on the gallery happen in face to face tutorials in the real studios, rather than

as mediated online discussions.

“With any space online it is really important to establish who “owns” it. The e-gallery is for students’ own use, to flex their creative muscles, test their own limits, and explore what it is to display work digitally. I personally do not think it should be a space for surveillance or assessment - I think that happens in more formal spaces on the course which are more “owned” by the values of the course. Make the gallery a compulsory space or an assessable space and I think it will become a less creative space.

“Just to say there is a public version of the e-gallery where work can be curated out of the private space and into the public space. This seems to me to be an excellent opportunity to start to interrogate questions of digital curation and the value (and values) of work. As yet we have not fully exploited that opportunity in fine art, but I think a staff / student curation group for the public e-gallery would be an excellent idea. This also brings me back to your first question about the gallery as a promotional tool. I think the curated public e-gallery could potentially be an excellent promotional tool for the course.”

Frank Abbot, ***, Nottingham Trent University, UK.**

The address for the MA PUBLIC public gallery site at Nottingham Trent University is:
<http://postgradgallery.lsz.ntu.ac.uk/>

As with VLEs, in accessing the Internet, learners actively engage in their own learning, navigating their preferred path through the information, and learning at their own pace.

They can also take advantage of the flexibility of access to resources: they can continue to learn outside of the University campus, and outside of University hours.

In theory, this means that all students would have limitless access to the Internet, but in practice this is not the case - the same limitations of access and availability are as true of the Internet as they are of VLEs. Not all students have access to a personal computer and Internet connection, and the cost of acquiring them means that wealthier students are at an advantage, directly contradicting the principle of ‘widening participation’.

Furthermore, again the students’ willingness and ability to use the resource properly is fundamental to its’ effective function:

“The Internet offers a wealth of resources but students often do not have the appropriate information seeking skills or domain specific knowledge and vocabulary to enable them to utilise these resources effectively.”

(Gaimster, Dr. Julia, and Sinclair, Rose: “Fashioning Our Future: Education in Fashion and Textiles in the UK”. London College of Fashion, Goldsmiths College, 2004.)

It is easy for learners to become lost, confused or overwhelmed by the scale of the Internet and the vast amount of information available. There are also an enormous number of distractions available via the Internet that have little or no educational merit: games, chat rooms, etc., that can serve to tempt students away from the learning process.

Finally, students can also be frustrated by slow Internet connections and download times, and password-or payment-accessed resources, which restrict their ability to ‘learn at their own pace’, and can seriously undermine the student’s enthusiasm to work.

Learning packages

The range of subject-specific materials that staff and students can access on DVD or CD-rom is increasing.

These multimedia-based resources are often interactive and, when well-designed, represent powerful communication tools.

Staff and students can access these software packages at learning resource centres such as university and public libraries at little or no cost, and can use them to support their learning process as and when required.

“Multimedia-based products are powerful communication tools, which stimulate the senses of hearing, vision, and touch by delivering a rich combination of media components in an interactive software environment.

“CD ROM based multimedia learning provides a dynamic environment to acquire knowledge and develop skills at a time and place convenient to you. The modules contain text, graphics, animations, photographs, video and audio commentaries to create an interactive, stimulating learning experience.”

(<http://www.elearning-textiles.co.uk/htdocs/Home.htm>)

Once again, these resources support student-centred learning and self-directed learning by allowing students to take responsibility for their own learning. Students learn at their own pace, accessing learning materials remotely and designing their own route through the materials, repeating difficult concepts as many times as necessary.

In addition, students can get immediate feedback on their performance via test exercises, if this function is built into the software.

“Introduction to Textiles” is a set of interactive CD ROMS developed by Leeds University that took 2 years to develop, and was introduced into their undergraduate and postgraduate programmes in 1995. The package uses multimedia to offer 70 hours of structured tuition on 82 topics and has also been used in industry.

In the promotional material presented on the ‘Fashion, Textile and Apparel Learning Centre Web Site’, “Introduction to Textiles” is described as:

“The most comprehensive training system for today's textile, apparel and fashion-related industries. Used by companies and universities world-wide, this multimedia CD-ROM provides up-to-date learning material direct to your computer.”

(“Introduction to Textiles” - Fashion, Textile and Apparel Learning Centre Web Site
<http://www.elearning-textiles.co.uk>)

The software features video and animation sequences that freeze-frame to allow students to learn at their own pace, and repeat information that is difficult to understand. A bibliography, glossary of terms, and online assistance are available, as are tests to assess whether learning has taken place.

The obvious disadvantage of this type of resource is the cost. Although some packages are not prohibitively expensive (“seeingdrawing”, a DVD package containing over 30 hours of viewing time is available for £45 at www.seeingdrawing.com), others can be far too expensive for many university departments to afford. For example, at the time of writing, “Introduction to Textiles”, described above, costs almost £3000 for the first-year licence fee, followed by £2200 per year for following years. Separate modules (e.g. “Yarn technology”, “Knitting

technology“ or “Clothing technology”) carry additional costs of approximately £1000 each.

“Interactive CDROMS are fantastic. I wish I could afford to buy them all. We are very envious of the teaching resources available in the UK because the value of our dollar makes the cost even more prohibitive.”

(Louise Duvernet MScS EEd, Australian Catholic University, Australia.)

Another limitation of learning packages is that much of the interactive learning materials currently available are directed towards children, and can therefore patronise adult learners, or contain material that is of limited value.

Commercial fashion and textile CAD / CAM software

Hilary Carlisle (Edinburgh College of Art):

I have little experience, but find that it is easy to be limited by the very mechanistic approach the packages have.

Clare Hussey (Northumbria University):

Coming from a clothing, rather than fashion background, I have a knowledge of a number of industry specific CAD/CAM applications that are widely used across the larger organisations within the industry and also to a limited extent within the academic environment. I think that through making new technologies available to students within the education environment will facilitate use if/when they enter the workplace, at what ever level or type of business.

Commercial fashion and textile CAD / CAM software packages, e.g. “Speed Step” software, or “Lectra” software, enable students to access a wide variety of tools that help them in the and the communication and presentation of design ideas, and the design and manufacture of garments.

A library of stored images - for example garment components, templates, photographs and figure illustration “blanks” to fill with colour and fabric render - can be accessed, added to, and used to create design ideas, or modify existing designs.

Drawing tools - such as different colours, pen widths, and line styles - and functions for drawing stitches, buttons and zips, are also available, while tools for creating production drawings, such as labels and measurements, and pattern-cutting software can assist students in garment manufacturing processes.

This type of CAD and CAM system is increasingly being used in industry, so familiarity with this type of software is useful for preparing students for employment.

In the learning environment, again students are encouraged to access the software at their own pace and as often as they need to support their work and training (as long as the equipment and software are available). Functions of the software and design processes can be repeated as often as necessary to develop skills, and students can design their own route through the materials.

An unexpected benefit of CAD and CAM technology in fashion and textile design is that the use of CAD / CAM software has led to increased interest in the subject by male students, thereby promoting ‘widening participation’:

“The introduction of CAD has also led to an increased interest in the subject by male

pupils. However this is still a fairly small proportion of the overall number taking the examination.”

(Gaimster, Dr. Julia, and Sinclair, Rose: “Fashioning Our Future: Education in Fashion and Textiles in the UK”. London College of Fashion, Goldsmiths College, 2004.)

Using this software, professional standards of presentation are possible, even by those with very limited drawing and presentation skills, however approval of these presentations is not universal.

“The standards of presenting work are in some ways higher (slicker, more 'professional', if that ever meant anything), but with the loss of 'hand-skills'... often the artistic, expressive side suffers. Too many presentations look the same; a range meant to sit in designer ready-to-wear looks Kmart/Walmart/cheap distributor of bad mass clothing in your country.”

(Timo Rissanen: University of Technology, Sydney)

The prescriptive and mechanical nature of the packages, and the “building block” approach to design that they engender can lead to students’ instinctive design and drawing skills being underused, and therefore becoming suppressed.

For the same reason - that they are not being encouraged to use their creative thought processes or imagination to the full - more creative students can find the software boring to use.

In addition, even though work can look very ‘slick’ and professional, many agree that it can also appear somewhat repetitious, two dimensional and boring, with different students’ work looking far too similar.

Despite the recent surge in enthusiasm for technological aids to design presentation, students and professionals in fashion and textile design are now used to, and becoming bored by, flat, 2-dimensional, impersonal computer-generated images.

There continues to be far more interest in drawn images - especially those with textural elements, such as fabric swatches, collage and textured finishes. As human beings, we are fascinated by, and drawn to, very personal representations of ideas. It is perhaps for this reason we are currently experiencing a waning in popularity of fashion photography in favour of fashion illustration, and a correlating waning in popularity of computer-generated images in favour of traditional illustration methods.

Experts in the use of CAD and CAM tend to disagree. Rose Sinclair, SpeedStep software consultant and demonstrator, comments:

“What this says to me is that lecturers are not engaging in the practice of the software in teaching and learning and this will have an impact on the practice, in many colleges thought actually needs to be given to strategy and planning in developing CAD / CAM effectively and with a strategy, e.g Huddersfield University has a masters course in CAD / CAM in textiles.”

(Rose Sinclair, lecturer, Dept of Design at Goldsmiths College, London, specialising in textiles and CAD/CAM. Rose also runs a textiles consultancy, specialising in CAD / CAM and textiles.)

Whether loved or hated, cost is inevitably a factor in deciding whether to integrate CAD and CAM systems in educational establishments. In Britain, due to Government initiatives and assistance, “Speed Step” software is available to schools for relatively little cost, about £260,

however for Higher Education establishments, to whom Government assistance does not extend, the situation is very different. Universities are required to pay full price for the software and licence fee.

Furthermore, once acquired, training for staff and students in the use of the software is also necessary, further adding to the cost of integrating the systems into education.

The usefulness of CAD and CAM software is also obviously dependent on whether the students have access to it within their working environment. For these systems to be properly integrated into students' working practice, workstations loaded with the necessary software need to be available within design studios, and in pattern cutting areas.

This is not possible in every university programme: indeed at JMU the Art School's computers are held in a basement media suite, two floors below the fashion and textile design department, and are therefore completely divorced from the students' usual working environment.

It is worth noting, however, that despite the limitations of cost and access, fashion and textile design programmes in HE are under pressure to acquire CAD and CAM systems because within as little as 2 years students who have been 'weaned' on CAD and CAM packages from school age will be entering Higher Education, and we must be ready to allow them to build on their CAD / CAM skills by having the systems available, and staff trained in their use.

Design Packages

Hilary Carlisle (Edinburgh College of Art):

"As above, it's as good or bad as the person who uses it. Someone who scans an image then applies a couple of filters is not using any creativity at all, but equally someone who explores, manipulates and subverts the software can be amazingly creative."

Clare Hussey (Northumbria University):

"A fairly new area to me, really just been using Illustrator for the last year, and just started with Photoshop, Not having been a design undergrad, I a pretty much self taught, which is often quite challenging.

"...I also forwarded your email to my Supervisor, Dr Kevin Hilton, he has been at Northumbria for a good while, he had this comment: My only anecdote would come from product design and how on a number of occasions 'scale' is an issue in CAD, big and small, and when the product is seen for real the response is 'oh! Is that how big it is?!'"

Computer-based illustration and design packages such as Illustrator, Corel Draw! And Photoshop allow students to access, copy, save, manipulate and print images in a number of ways, and then communicate their design ideas professionally.

The advantages and disadvantages of these packages are similar in many ways to those of the CAD systems described above: advantages include their widespread use in industry, and the possibility of producing efficient, professional presentations. Disadvantages include the fact that the resulting presentations can appear repetitious, 2-dimensional and predictable, and that personal, instinctive design and drawing skills may become underused and suppressed if students become over-reliant on "user-friendly" software.

"In any design discipline ... there is a danger that the over-use of computers in education (or later studio practise) will lead to a lessening of ability in other areas. However, it depends on what your definitions are. A drawing made with a computer is still a drawing (just one that is made with a different tool) - it depends what the purpose

of the drawing is.

“...Computers are helpful in helping to generate certain kinds of marks and very bad at generating others - which way to go (in the sense of tools to use) will often be influenced by the emotional content of the message one is trying to communicate and which method of reproduction is appropriate as an end outcome. In many cases a computer could be a hindrance to achieving a design that engages with its intended audience - in other situations a computer is essential to create the best design possible.”

(John Young, lecturer in graphic design, Liverpool John Moores University.)

Although cost is as much a factor with these packages as with fashion and textile specific CAD packages, the fact that they are essential tools for a far greater range of students (graphics, multimedia, product design, architecture and fine art students all use them on a regular basis as well as fashion and textile design students) means that they are available and used regularly in most university art departments.

Despite this, access to the software is still a problem if computers are not available in the design studio, or at home, where students could effectively integrate the software into the design process as another design tool, rather than viewing it as a “stand alone” discipline that is completely divorced from their design work.

Digital Cameras

Timo Rissanen (University of Technology, Sydney)

Hilary Carlisle (Edinburgh College of Art):

Once again they have their bonuses and their downsides. They make the collection of inspirational and educational imagery incredibly easy and can significantly reduce the time needed to research a visual topic. However, unless you are able to afford a very high end camera, there are still limitations in quality and flexibility over a professional SLR camera.

Clare Hussey (Northumbria University):

a fantastic facility to gain instant images that can be utilised within the various forms of digital media.

The advent of digital photography in recent years has speeded up the photographic process significantly, enabling students to view their photographs, decide whether or not to keep them, and download and manipulate the images as soon as they have been taken.

This immediacy has brought about a revolution in design students' interest in photography, and students' own photographic material is increasingly being used as part of a number of design processes, such as research, design development and styling.

Students can record various stages in the design process, such as gradually evolving toiles or garment shapes so that potentially useful ideas are not lost and, having produced their garments, students can use the camera again to quickly and efficiently record or style them.

Given that it is the speed and efficiency of digital photography that has attracted modern design students to the medium however, it is perhaps inevitable that more traditional methods of design communication are falling victim to its' popularity.

Among design students, the slower, more thoughtful practice of drawing as part of the design

process is gradually being diminished, and as a result students' drawing skills are being eroded. Large numbers of photographs are replacing sketches and drawings in sketchbooks, and it is becoming increasingly difficult for educators to convince students that drawing (which they often consider to be time-consuming and boring) is still a worthwhile activity.

The problem of expense is, as usual, also an issue. Digital cameras are expensive, and they have a reputation for heavy consumption of batteries, making them even more expensive to use regularly. Universities cannot supply every student with such expensive equipment, so once again wealthier students are advantaged by the increasing use of digital photography in the design portfolio.

The “Slowing Revolution”

The wealth of disadvantages as well as advantages to the implementation of ICT in education offers some clues as to why we are currently experiencing what The Guardian recently called “The Slowing Revolution” (<http://www.guardian.co.uk>), whereby the race to adopt new technological advances as aids to teaching has not continued as expected, but has slowed down significantly in recent years.

In fact, despite - or perhaps because of - the accelerated drive to adopt digital technologies, in Britain the fashion and textile design industries are currently experiencing a backlash against technological methods of working, and the use of traditional handcrafted techniques is once again on the rise.

“Graphics has to engage with shifts in popular culture and at the moment there is a shift away from imagery that is obviously created by computer - so I am actually being forward-looking when I talk about the acquisition of handskills.”

(John Young, lecturer in graphic design, Liverpool John Moores University)

As well as the resource-specific problems described in the chapter above (“Evaluation of a range of Visual Communication Tools available to educators in fashion and textile design”), there are a number of problems that are true of computer-based learning tools in general that may be responsible for this backlash. These need to be acknowledged and addressed if technological tools are to be effectively integrated into fashion and textile design pedagogy.

The loss of creativity

The obsession with 2 dimensional computer-generated imagery, brought about by rapid developments in digital imaging processes, has been responsible for the greatest criticisms of the use of computer technology in fashion and textile design. It is felt by many design professionals, as well as academics, that traditional skills - an important part of fashion and textile design education - may be lost, and that the lack of personal involvement in the creation of 2 dimensional fashion and textile design undermines what is, to many, the essential 3 dimensionality and character of the craft.

Do you feel that the current use of technological tools has
> affected students' drawing skills?

“More accurately, I think it slows down some students' drawing learning. I feel privileged to have studied under a design tutor who believed that even 'flats' or DDS (design development sketch) should convey the designer's artistry and signature. Only the best students are able to carry this over to computer-generated drawings. While to students the computer often seems the all-capable saviour, I think it actually takes a lot of skill to reach the standard embodied by hand-drawing, to avoid the above-mentioned Kmart effect. (I hope you are not speaking to Kmart employees.)

On a more general note, I feel that some designers and students equate fashion design with choosing fabrics and drawing garments in Illustrator. I passionately disagree with this approach.”

(Timo Rissanen: University of Technology, Sydney)

In my own working practice, I have observed a trend amongst students to demand “instant” work that can be produced in a hurry without too much thought or consideration. Their sole focus is the rapid creation of a “product”, while the creation process itself is afforded little, if any attention or merit.

Students who adopt this “super-charged”, accelerated view of the design process cannot engage fully in the process of developing design ideas, and as a result the “instant solutions” they produce often have no integrity, depth or conviction.

In 1998, Jane Harris wrote:

“It is clear that ‘craft’ education is being marginalized at a time when digital imaging technology is fast becoming the medium for a whole other world of communication, commerce and education. However I believe that 2D and 3D computer based digital imaging processes (computer graphics) could greatly benefit from the unique aesthetic skills in material understanding and making that the ‘crafts’ have to offer.”

(Jane Harris, “Preparing a Medium for the Next Millennium: The “Crafting” of Computer Graphics: A Textile Makers Perspective”. Royal College of Art, London. 1998.)

The skills associated with fashion and textile design are as important today as they ever were, and the development of new ways of working, rather than being seized as a replacement for current working practices, should serve primarily to provide us with a greater amount of choice in the range of methods by which the fashion and textile design process can be carried out.

Hilary Carlisle (Edinburgh College of Art) puts it well:

“Digital technology can be used to inspire a whole new realm of creativity that it was impossible to fully explore without it, but it can also be used a mundane tool for replication and technique for avoiding creativity all together.”

(Hilary Carlisle, Edinburgh College of Art, Scotland)

Accessibility

Staff:

“As a casual part-time staff member I did not have an office for the first two years of teaching, nor are there computers provided for such staff. As a research student I do have an office with a computer (no scanner though), but feel sympathetic to the other casual staff who do not. They get encouraged to use Blackboard, email is the official form of communication, there is an expectation of marks and grades to be submitted as a file, yet the casual staff need to use computers in the student labs. This is particularly awkward when tabulating students' marks.”

(Timo Rissanen: University of Technology, Sydney)

Students:

As described above, access to equipment can be a serious stumbling-block to the idea of

students working autonomously. Some students own their own PCs, others do not. For example, while in theory access to computers and the Internet is available to all students at Liverpool Art School (LAS), the high cost of equipment and running costs means that availability inevitably falls short of demand.

In the media suite housed within LAS, there are 90 machines, accessible in theory by 1200-1500 students from the Graphics, Multimedia, Fine Art, Contextual Studies, Architecture and Product Design and Fashion and Textiles Design departments.

Due to the heavy demand and block-booking for taught sessions by the Graphics and Multimedia departments, in practice only 15 of these machines are actually available to the fashion and textiles students, of whom there are around 200. This equates to in excess of 13 students per machine.

Further, due to the booking of these machines for the delivery of the computer modules to the level 1 fashion and textiles students, it is not uncommon for there to be no machines at all available to fashion and textiles students who wish to use them outside of taught sessions.

The library facility presents the same problem: although it houses computers accessible by all the students, again the resources are heavily over-subscribed. The high cost of printing full-colour imagery presents another financial restriction to the art school students in particular.

Added to the problem of insufficient equipment is the problem of hours of access. The theory of 24/7 access to computers is inaccurate as university buildings and libraries have restricted opening hours.

Students who own their own PCs, therefore, inevitably have an advantage over those who do not, added to which this lack of accessibility means that students are far less likely to seek out computer-based learning tools than if the computers were available in their work areas, and thus their effectiveness as a learning tool is reduced.

"With new improved graphics programs, pattern generation software, and computerised sewing machines, digital printing and then on-line resource access there is a need to have computers in the textiles rooms. Students are engaging with it as design tool and not just a research tool."

(Rose Sinclair, Lecturer, Dept of Design, Goldsmiths College, London)

Technical problems

The advent of computer-based technology has brought with it a whole new set of technical problems that can make the use of computers, especially to new users, both baffling and frustrating.

Lost files, computers "hanging" or "crashing", the inconvenience of different file formats that will open on one computer, but refuse to do so on another, infuriatingly slow download times, and problems created by file sizes are all problems that can lead to a deep suspicion and dislike of technology, and a tendency to revert to traditional, non-computer related methods of teaching and learning.

The inter-relationship and inter-dependence of several components (monitor, computer, keyboard, mouse, printer, scanner, etc) that are often necessary to complete a function can also be frustrating - if only one of these components is faulty, the whole system becomes useless.

Too many presentations are ruined by the vagaries of technical faults, or inexperience on the part of the user. Audiences of PowerPoint presentations are distracted by precious minutes being wasted by desperate presenters trying to make the system work:

“...is this on...? What do I...? Oh, is that it? Is it on? Oh,...erm...no....hang on, it was working before....”

When it works correctly, and is used proficiently, new technology can greatly assist the educator, but all too often technical “glitches” and inexperience stand in the way of successful application.

However, the failure of tools is nothing new, as Louise Duvernet points out:

“This is not a new phenomenon. Lower level technology has proved to fail – overhead projectors, slide projectors, pencils break, water puddles and ruins artwork – so it’s just another problem solving activity.”

(Louise Duvernet MScS EEd, Australian Catholic University, Australia.)

The real challenge is whether the educator has the ability to rectify the problem in time to save the lesson. A broken pencil is only a very small challenge to most of us. A broken disk drive may take a little longer!

New skills to be learned

“There is a drive to introduce ICT increasingly into the learning process, but it appears to require the teacher to take on the role of technician.”

Tom Ward (the name of the author has been changed): “I watched in dumb horror”, Guardian Education, Tuesday May 20, 2003

In order to minimise the technological problems outlined above, it is necessary for educators to overcome any suspicion of computers and associated technologies, and become trained and competent in their use.

The students, judging by their skills, do get sufficient training. As a staff member I don't think I do - there is an assumption that you know all the hardware and software. I also know staff who have the latest Mac in their office and can barely use email.

(Timo Rissanen: University of Technology, Sydney)

Finding the time, and financial means to accomplish this, however, presents another set of problems.

It is ironic that overwrought educators are being told that new technology will serve to make their working lives less stressful - while the truth of the matter is that many educators are facing even more stress due to the pressure to learn new technological skills.

In addition, given the vast number of things that can go wrong when preparing computer-based materials (see “Technical problems”, above), educators are actually being advised to prepare computer-based materials, whilst having “low-tech” teaching materials prepared as back-up - thus doubling their workload!

Further, in addition to the preparation of face-to-face learning materials, educators are also expected to prepare, present and regularly update materials for inclusion in virtual classrooms - VLEs - increasing their workload still further. Typically, no extra time is allocated for all this

extra work, and certainly no extra pay!

“At times, due to breakdowns accompanied by dematerialising technical staff, computers make life hell for staff and students alike. I am untrusting of the university computers now to the extent that I am usually prepared to give a lecture without the aid of a Powerpoint. More than once I've encountered a computer with all disk drives broken (presumably by other frustrated staff members). Giving a lecture and referring to the CD in your hand is only entertaining ... for the first 10 minutes or so.”

(Timo Rissanen: University of Technology, Sydney)

Built-in obsolescence

New learning materials appearing at an increasing rate – no sooner have you bought or mastered one piece of software or machinery than it is declared obsolete. “Technophobes” find this confusing and worrying.

The fear getting “left behind” leads to increased anxiety and suspicion of new technology, and once again leads to educators turning their back on it in favour of traditional teaching methods.

Further, universities rarely have enough money to buy the equipment needed to keep their students abreast of technological developments. As the technology becomes available to produce different effects, or to speed up processes, it is unlikely that we can pass this experience on to our students as part of their learning process until new technology has become relatively “old” - and therefore affordable - technology. Hence it is difficult to keep up with advances that are being made in industry.

Jargon

A whole new language has sprung up around the use of the internet, which can be both baffling and off-putting for the uninitiated. The new Internet user is confronted with a whole new vocabulary containing such words as “netiquette”, “emoticon” and “neterati” plus an endless string of acronyms: CAA, WWW, IRC, CMC, etc.

Isolation

It is feared that the increasing number of students working in isolation via their computer means that the “community” of education may be lost:

“The ‘Web-phobes’ are very worried that the benefits of learning together may be lost and that it will be a bad day for knowledge, for feelings, for the joys of gatherings and groups.”

(Gilly Salmon: “E-moderating: the key to teaching and learning online”, February 2000:
<http://www.atimod.com/e-moderating/extracts.htm>)

Louise Duvernet, however, working in Australia with students whose geographical locations may be widely spread across different states, strongly disagrees with this claim:

“My experience is that the online learning builds communities of education. They are just different to those housed in one institution. There is more cross-fertilisation of

information and ideas and there is just as much communication between students. The conversations on the discussion boards can be viewed by all students and they see every word as opposed to overhearing some garbled question. They are very good at supporting each other in the environment.”

“I have built quite an extensive learning community from the students I have met online and they have discovered colleagues that they would never have found otherwise. These are students who were once isolated who have found a learning community.”

(Louise Duvernet MScS EEd, Australian Catholic University, Australia.)

In this situation it is clear that, while a lack of face-to-face contact may be considered a loss to some, the possibility of an online community is far preferable to nothing at all – adding to students’ motivation to learn even in isolated areas.

Legislation

The legislation surrounding the use of computer-generated imagery - e.g. copyright legislation - can also be a problem, and present another raft of information to be assimilated by both staff and students in the design environment.

Students’ approaches to learning

In education, it is essential to remember that even if availability and access were universal (and currently this situation is still a long way off), the success of such learning resources as CAD / CAM software, design packages, learning packages, the Internet and VLEs is entirely reliant on students’ awareness of them, their skill in using them, and their willingness to access them.

ICT does not fundamentally change the way people behave. For “remotely accessible” learning tools to have any educational merit at all, students have to be motivated to use them.

In short, the human element in the learning process cannot be ignored. Technology is most useful where effective communication and “user-friendliness” is paramount.

Dr Charles Cook from Loughborough University conducted a study into how students used the Internet in three different universities, asking them to keep logs and to participate in interviews. Dr. Cook states:

“The romantic idea that people only need to be given this resource and they will go off and start learning is not right. The web doesn’t make tremendous differences to what students do. The problems of motivating students when there’s so many other interesting things they could do still exists.”

(Joe Plomin: “The revolution that wasn’t”, The Guardian, Friday June 22, 2001.)

By providing more flexible access to learning resources, using the WWW can encourage students to take a more active role in education and become more independent learners. But even independent student learning needs to be guided and supported, either directly by access to tutors or implicitly through the organisation and design of the resources. Appropriate induction and ongoing support are essential for effective learning to happen.

“Having 24 hr access to information is a good thing when counterbalanced with human contact (tutors or peer group) - we should never forget that "the design process"

(whatever you define that as being) is an organic dialogue between human beings and as long as this is at the forefront of one's mind, how one gets there and which tools one uses will be irrelevant. Obviously, the more one knows about a range of skills and processes the more likely one will be able to choose a mix of these to achieve one's particular vision."

(John Young, Lecturer in graphic design, Liverpool John Moores University)

"... the computer industry now advertises not computers, but human-computer partnerships: it matters less what the technology can do alone than what you want to do with it."

(Malcolm McCulloch "Abstracting Craft: The Practised Digital Hand" 1996.)

Although the drive to harness the economy, power, speed, and global reach of computer communications is understandable, it is important that the differing technologies available are assessed objectively for what they can offer in terms of education, and are used to optimise the teaching and learning process, rather than being seized and used as "technology for technology's sake".

"I think technology is there to make things easier and faster; it's part of the support infrastructure. It should never be THE driving factor in a fashion design subject."

(Timo Rissanen, University of Technology, Sydney)

In the wrong hands, information technology can hinder the teaching task, rather than enhance it.

ICT needs to be integrated sensibly into a learning programme. Instructors and students alike need to recognise what is the best use of this technology in order to achieve the greatest benefits.

"The key to using technology in the curriculum is to carefully consider what value it will be adding to the learning experience and to ensure that it is used only when appropriate to the learning outcomes that you are trying to achieve."

(Gaimster, Dr. Julia: "The role of technology in supporting student learning". London College of Fashion.)

What is important is that the focus needs to remain on the teaching, not the technology. A whiteboard and marker in the hands of a good teacher / communicator will always be a more effective tool than the most technologically-advanced gadgets in the hands of a poor one.

Generally, training for both staff and students is rather thin on the ground. More experience is necessary to raise ability across the board, but a very diverse situation regarding access to relevant hardware and software for both staff and students means that academics are battling against an enormously varied range of abilities and experience.

As a result, in many institutions it is almost impossible to base student projects around the use of technology.

The following example from Sandy Heffernan (...New Zealand) expresses this problem well:

“Lectures for my theory Textile Design History paper were placed online, supposedly for the second year students to refer to. However, in another aspect of the paper -to both challenge the students use of technology and make them more comfortable with it ,they were required to submit designs to the 'drop box'. One third managed to get their jpeg files there, one third sent freehand files (jpeg had been stipulated) and one third failed in a group of 30. Fortunately, I requested hard copies as well.”

(Sandy Heffernan...New Zealand)

Again, this example reinforces the problem that the staff / student workload is doubled when, due to the variety in understanding and availability of computer hardware and software, hard copies of work need to be requested AS WELL AS digital.

“We need computers to prepare students to participate in the global economy, as we are so isolated we have to look at business possibilities for our students from other perspectives.”

(Sandy Heffernan...New Zealand)

Sandy Heffernan – New Zealand. A very good point!! On a smaller scale, this point is also relevant to Liverpool. Although we are in a Country that has an extremely good reputation for fashion, in the North we are still largely “cut off” from the centre of fashion, London. Many fashion professionals simply will not make the trip to the North of England, and some companies are unwilling to take on Northern students for work placements, in case accommodation becomes a problem. The situation improves gradually with better communication – and faster trains!!

Footnote - Learning Haptically

As a footnote, it is interesting to note that research is currently being carried out into haptically - enabled devices: that is, devices that exploit the sense of touch.

In the same way that the development of computer graphics has expanded exponentially in the last 2 decades, haptics processes are currently poised to enjoy the same extremes in both attention and development.

This means that future educators will not only be able to exploit the visual interests of their students, but their haptic, or tactile, interests as well, and the range of technologies available to us in fashion and textile design education - and the advantages and problems associated with it - will continue to grow!
