



Distributed e-learning in Art, Design, Media: an investigation into current practice

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Research Team: **Cheri Logan: Cumbria Institute of the Arts**
 Simon Allan: Cumbria Institute of the Arts
 Anish Kurien: Cumbria Institute of the Arts
 Debbie Flint: ADM-HEA

6. Findings from Focus Group Research

Focus groups were held at seven British HE Institutions in 2006, drawing on respondents from a variety of art, design and media disciplines. Respondents had a variety of roles, predominantly as lecturing staff, but ICT support staff were also well represented; students were also involved in four of the focus groups. Despite the variety of art, design and media disciplines represented and the range of roles held by respondents, key concerns appeared to be replicated across the sites studied, providing triangulation of findings and enabling the data to be assembled under the headings offered below. Several themes emerged strongly from the discussions, notably those relating to:

- **the happiness factor: issues of affect in e-learning**
- **drivers and motivators for ICT use and development**
- **equity and access**
- **perceptions of learning and the impact of e-learning**

The findings are therefore reported under these headings, each of which generates a number of sub-themes. The first issue discussed, that of 'affect' has been reported first because it emerged as the issue of most significance to respondents, whose 'feelings' and 'dispositions' towards technologies vividly coloured their experience of e-learning. Our respondents therefore described the whole gamut of emotions that technology use generated in them, and as contemporary learning theories recognize the indivisibility of emotion from thinking, learning and understanding it is worth giving these views some attention. The second theme was one that related primarily to teaching staff, with a mixed picture emerging of how institutions managed technological change and their expectations of staff engagement with e-learning. Under the third heading, significant points emerged about how ICT can enable increased access to learning, although unequal distribution of resources and support and technological incompatibilities have the potential to undermine this. Here there were also interesting indicators of the ethical approach that staff and students are taking towards sustainability and equality issues in technology use. The fourth section provides an overview of current views of learning in art, design and media and of the impact of e-learning on the sector. Some of the main uses of ICT are described by respondents, and the challenges as well as the opportunities posed to users are discussed.

Respondents have been anonymised in line with the ethical assurances provided to participants in the research, and the higher education sites involved will be referred to simply as Institution A, B etc. More detail on the constitution of the focus groups is included in the section on research methods (see Section 3 above). Direct quotes from respondents are included in this section, italicized and placed in double inverted commas – e.g. *“learning”*. Although referring to one instance of comment, individual quotes have been chosen as broadly representative of a theme discussed by several respondents; sometimes quotes have been provided in clusters to illustrate a general consensus of opinion.

- **The happiness factor: issues of affect in e-learning**

In the preface to her book on learning in the digital age Gilly Salmon poses three questions that she regards as being most significant for establishing principles for e-learning, one of which is ‘how can teachers and learners use technologies happily?’ (Salmon, G., 2003). This section of the report focuses on this ‘happiness factor’, examining what makes respondents in art, design and media happy and unhappy in their technology use. The ‘happiness’ in question is a relative term as the background is one of rapid technological advance, sometimes contradictory pedagogical aims and the ubiquity of core technologies that are concurrent but frequently incompatible. In higher education the pressure for change is intense and in describing their ICT use in art, design and media respondents in all roles referred to the high learning demands made of them. To put it colloquially, a very steep learning curve had been experienced and was still being experienced by most participants. They also saw themselves at very different positions on the e-learning mountain, with some negotiating the peaks and others just gathering courage to venture beyond base camp.

At the pinnacle of ICT use ...

Respondents often experienced conflicting feelings about their use of ICT, and their level of satisfaction with core technologies often depended upon how confident they felt in their own capabilities as a user. The expectations placed upon them by others (i.e. institutional managers, tutor or student peers, those in other roles in the learning and teaching relationship) were another key factor in this.

For example, one lecturer at Institute A communicated a strong confidence in his use of ICT, both in terms of his own skills and in his belief that it provided real benefits to student learning. His institution’s use of Blackboard as a VLE had provided obstacles to uptake within the school of art and design, due to colleagues’ initial dislike of the visual presentation of the software, and he recorded that *“Lots of people have a tendency to say ‘we don’t want this, it looks terrible”*. However, he had overcome this reaction himself, noting that *“I decided to look past that [because] it offers a very good resource in terms of being able to house content”*. External drivers in the form of funding for remission and software purchase helped to progress the work that this lecturer’s personal orientation and intrinsic motivation had begun. A strong feeling of ownership of the work undertaken demonstrated his engagement with it, and the fact that the university did not attempt to pressure him too much for completion was also appreciated. The opportunity for experimentation was particularly appreciated, as was the ‘right to fail’ –

“It was fun ... because I knew that I was doing something nobody else had done ... [so] you can get things wrong and nobody’s bothered. When you’re trying to get something done that’s experimental, you’ve got the right to failure”.

The fact that he found the development activity to be ‘pleasant’, ‘fun’ and a source of personal satisfaction was integral to the role that he later adopted as unofficial ICT ‘expert’ within the department. Teaching colleagues reported that they routinely referred to him for help with computer use, and his support was a significant factor in their own development in this area. There

was other evidence that the more formal training sessions on offer were not widely taken up by staff, so the accessibility of expertise via a helpful colleague was particularly important.

The same lecturer had built significant and productive working relationships with colleagues from the ICT technical support area, and he regarded this "...creative collaboration..." as resting upon a willingness to consider them as co-collaborators in a joint enterprise rather than as "service" or "menial" workers. The mutual respect built in this way enabled the technical support staff to engage productively with the learning and teaching aspects of the project, so that the tutor could report that "I think they've been very happy to work with me because I've always been asking them to do something other than house-keeping."

At another institution there was already widespread adoption of ICT for learning and teaching activities. This had resulted in tutors' high degree of reliance on computers, which were seen as integral to all aspects of work. A high value was placed on 'favourite' technologies, with which users were seen to have developed relationships of dependence; for example, one technician/lecturer reported that –

"I really can't picture my job without a computer, it's a horrible thought ... If someone went into my office now and took it away I would be completely lost."

Others reported having "*struggled*" to cope after a recent relocation meant they were without communications technologies for a period, while the issue of technological access dominated staff meetings "*... it's always top of the agenda.*". There was a clear overspill between the familiar technologies of working life and those related to leisure and personal time, and access to up-to-date technologies was important for in less work-related ways. For example, tutors described the benefits of having portable entertainment on tap for "recreation, watching DVD's", "taking my music when away" and as providing relief from everyday pressures - "escaping the humdrum".

Six students in the focus group at Institute B described the multiple uses that they routinely made of ICT, with learning-related activities coming relatively low in their list of priorities. Enjoyable activities such as game-playing, internet shopping and general email use were noted as key uses, with "*work-related things*" coming after leisure-oriented ones. Overall, students in all of the institutions expressed recognition of the positive potential of computers to enable personal interactions, both in learning and in life. One respondent was enthusiastic about the use of webcams, which enabled her to communicate with her daughter who was away at university – "*Now I have Skype I can talk to her as much as I want.*"

Respondents recorded a variety of leisure as well as work applications in their computer use, with ratios of leisure to work usage changing according to current priorities. There was an aspirational aspect to this, with students adopting an imaginative view of the potential of technology to open up new horizons, so that individuals were empowered to defy restrictions of time and space. These views were referenced to students' experience of the science fiction genre, and they described computing as enabling them to "*... live in a different sense*", engaging in "*... time and space travelling*" and "*communicating across the world; it's mixed up with Star Trek.*" There were additional aspirations for human/ICT synergies - some currently outstripping technological realities and likely to do so for the foreseeable future; for example, one favourite function was described as involving "*the telepathy chip*". This was a common theme, with students explaining how it might work as follows:

"I'd like something that could translate my brain into something I can use"

"I'm really dyslexic ... I tend to forget things as soon as I think of them. So the computer would read my mind and keep a list of all the things I need to remember plus vibrate when I need to do something"

Students were disposed to like and enjoy computer technologies, and where manufacturers had made efforts to produce inviting designs they were much appreciated. Colour and shape was a significant factor here, generating loving descriptions of appealing hardware:

"I saw this really nice wide-screen laptop ... the other day and it was really nice and flat and it was bright orange with red pinstriping"

"I'd like it in pink!"

"I like the Dells because they're black and they're sleek."

They frequently described their personal acquisition of new technology as "exciting", and sometimes as emotionally satisfying – *"It's called a Sea Disk so I call it my little sea cow. I like having that, it's like a little pet ... [it] is pretty."*

Ups and downs ...

Not all experiences of computing were as satisfying as those recorded above, however, and respondents described their ambivalent attitudes to ICT use. A strong sense emerged of their using the focus groups as an opportunity to reflect on these positive and negative factors and come to a balanced evaluation of the current situation. This section of the report therefore reflects this ambivalence in respondents, and is less conclusive than elsewhere.

Tutors in one institution described the ways in which most of their apprehensions about using computer technologies had proved unfounded. They described the "*basic fears*" that most of their colleagues had initially had about using laptops to record tutorials and keep student records as having been overcome, although there was still "*a lot of apprehension*" in other faculties which were only embarking on this change. Most full time art, design and media staff were issued with laptops and were reported to have "*taken well to using them as part of their everyday practice*", while earlier fears about the potential for damage or loss of these expensive mobile resources had proved unfounded. Only one laptop had been damaged and one stolen in the course of five years. However, use of the Institute VLE was reported to be less developed. Despite its clear potential one tutor noted that "*There are lots of positives with the VLE, but no real evidence that these things will work, just hopes that they will*".

There was also a strongly perceived downside to the communicative ease enabled by ICT, with comments on the potential for this to overwhelm individuals –

"It always fills me with horror, as a head of faculty who gets God knows how many emails a day, that students are going to be let loose on an email system."

This sense of lacking personal power in the face of rapid technological advance – "*computer volumes quadruple every year ...now it is dominating us*" – particularly affected attitudes to email use, with a sense emerging that this type of communication was an increasing "*burden*". It seems this characterization was tutor-led, but students had also taken it on board and recognized how difficult it could be for tutors to deal with email volume. They commented that –

"I don't want to be another one of those emails taking up the tutor's time, just another student, just another statistic" and

"I know of a particular lecturer who said to us 'Please don't wish me Merry Christmas on email.'"

For their part, tutors suggested restrictions through a quota system –

"Emails should have credits attached to them. You can only use so many a day ... students can only use them in office hours."

These comments provide an interesting perspective on the idea, often viewed as a central tenet of e-learning, that it promotes enhanced interchange without constraints of time and space. In this context there appeared to be a consensus on the need for *"People talking face to face and less emails"*, although there was also some confusion about what now constituted 'face-to-face' communication. New definitions of this appeared to have crept in, as was evident in the exchange between respondents that follows:

"You can have webcams. Is that face-to-face?"

"Effectively, yes."

"When you stand in front of someone it doesn't make a difference whether it is a screen or not; it's the same information."

The issue of 'coping' with technology-driven change was seen as double-edged by tutors. The benefits afforded by ICT had already been sufficient to make teaching staff highly dependent on computers and the internet – *"If we gave away the computers tomorrow people wouldn't know what to do."* – while growing experience tended to make them more open to new technological innovations that came along. These innovations were sometimes embodied in external examples which provided encouragement and aspiration for further ICT use, such as the UCAS online system - described by respondents as an *"inspirational, exemplary use of the internet"* using *"elegant, well-designed"* software. Such examples of good practice clearly acted as catalysts for creative problem solving, and there were aspirations to replicate and apply similar solutions *"... to internal college structures such as the quality system."* It was clear that there was current and heavy engagement with ICT use by tutors in art, design and media, some of whom reckoned that 80% of their computer use was work-related. There was no sense that this had reduced workloads, however. In fact one tutor with extensive technical expertise noted that the rewards of ICT use were not evident in this respect, or at least not being claimed by colleagues – *"No-one does anything nice with the time saved."*

Slippery slopes ...

Feelings of personal prestige emerged as an important issue for tutor respondents. At its best ICT use could support and enhance this, and individual stories of ICT 'triumphs' were related – *"Putting my first Powerpoint together, and presenting it successfully at a conference, with no technical hitches."* Preserving the appearance of control and competence over ICT in teaching situations was a key issue in this –

"... it makes you look so much better, it makes you look so much more professional, so much more efficient, so much more knowledgeable."

Conversely, only being competent to use 'old' technologies was associated with loss of face – *"I'd be embarrassed to use a slide projector now"* - and further potential pitfalls were all too evident. One cautionary tale related the problem of -

"... incompatibility between computer and the host electrics or projector at conferences. I've seen one lady in tears, having spent her allocated timeslot trying to get her computer to work."

This type of blow to professional prestige was seen as difficult to overcome when occurring in front of students, but disastrous in front of one's peers. Despite recognition of the usefulness of computers, they all too often had the potential to make *"... competent experts feel incompetent."*

Personal and professional prestige also involved tutors' relationships to the institution in which they worked, with ICT access having become symbolic of status. The high value accorded to ICT in many institutional settings involved the idea of enjoying 'ownership' and personalization of the technologies involved, an expectation seen as reasonable – "... [staff] want their own computers, and quite rightly so." There was a high degree of prestige related to the idea of having one's own "digital identity", so that "staff can feel part of the institution." This was particularly important for part time staff –

"... more people would prefer to have their own computer than their own desk ... more and more staff are asking for laptops ... it's also to do with feeling valued." (Composite of focus group comments)

Tutor/institution relationships could now be legitimized by staking a claim to digital rather than physical space. The status that institutions once accorded to staff by providing them with desks and offices was seen as replicated by recognition of their "digital identity". The sharing of computer technologies, as previously in the sharing of physical resources, was thus seen as an indicator of being lower in the institutional pecking order. Having one's own computer hardware, software and an established virtual identity on VLE's, emails etc. was the contemporary equivalent of being provided with a comfortable and well-equipped office in the past.

Sliding into trouble ...

The threats posed to personal resources and personal security by computer use were an important topic of several of the focus groups, although security was more of an issue in some institutions than in others. Many of the problems related to ICT infrastructures "crashing and losing work", a situation that "can put you back for weeks" and it was felt in several settings that more development was needed before trust in the current infrastructure could be merited "... in this institution the server falls over too often ... if we are serious about e-learning they have got to sort it out." It was clear that these threats to precious resources were very real to participants by the emotive language used to describe them, as in one comment that:

"I have deposited half my brain onto my laptop ... the thought of a virus attaching it is scary."

- and in the extension of the metaphor of health and disease to describe possible solutions "... [if] you have a virus and crash, you should have like antibodies." It was suggested that the 'antibodies' might constitute services such as an automatic daily backup of files by the server. Both students and tutors expressed deep-seated anxieties in relation to this issue, with many descriptions of the "scary" and "nightmare" situations involved in trying to retrieve lost work, remember forgotten file names and locate expensive expert assistance to resolve problems.

However, there was another dimension to the anxiety expressed about coming under 'external' technological attack, and this focused on personal as well as work interactions with computers. Concerns were expressed about "being electronically stalked ... receiving abuse" from anonymous sources, and respondents discussed instances of this. On one occasion electronic tracking in a university had failed to identify an abuser, as "...they traced it to an open access centre but MSN wouldn't reveal who it was". The power of ICT to open up an individual's work resources and life to possible outside interference, and the potential loss of control over these, led to feelings of anxiety and distrust. Personal security in computer use was a significant issue for students in many of the focus groups, with one student describing an undesirable intrusion through a programme download – "... I let someone into my computer who started chatting ... [saying] 'I'm a nice man' ... and I couldn't get rid of it...." Another expressed more generalized anxieties in relation to widened exposure to external predators:

"Not everything is coming from one direction. When I swim in the sea it's different from swimming in a pool ... in the sea you never know if a shark is coming."

- **Drivers and motivators for ICT use and development**

Tutors across the focus group institutions described a wide variety of factors driving ICT use and motivating themselves and their colleagues to adopt e-learning. These included personal interests, institutional cultures around staff training, availability of external funding for developments and the influence of external professional communities.

Interests, options and appraisal

Focus group discussion allowed a picture to emerge of the kinds of institutional support offered to staff and the expectations being made of them in regard to take-up of these. This was very mixed, with all gradations between compulsory training for all in VLE/ICT use and totally optional programmes being offered. It is worthwhile considering the different outcomes that emerged within individual institutions as a result, as the following examples illustrate.

In one institution, external drivers in the form of teaching remission and granting of funding to purchase computer tools helped to progress one tutor's e-learning development work. The work was sponsored by the university's learning development unit, although the pursuit of personal interest in ICT seemed far more significant for the individual concerned. In this institution there was a programme of staff development offered to familiarise tutorial and other staff with the VLE (Blackboard) and with other aspects of computer use related to e-learning, but no compunction to undertake such training. It was the perception of staff that few colleagues therefore engaged in such activity. Wide diversity of experience of ICT was reported by tutors at this university, and individual expertise was seen very much as a facet of personal inclination and historical career circumstance. Expert colleagues within departments tended to spearhead developments, and their sharing of expertise tended to rely on personal goodwill between co-workers. There seemed to be few characteristics of particular subject areas that placed them at the forefront of e-learning development, nor was the established use of technologies such as computer aided design an indicator of this. For example, in one institution the fairly rudimentary IT skills that an art history tutor attributed to herself were nonetheless regarded as placing her far ahead of colleagues in other departments such as product design, fashion and textiles and architecture. Even the use of email for general communication purposes was hardly taken up amongst many colleagues. Conversely, a clear strategy for introduction of ICT into faculty activities had been produced at a second participating institution, and this related both to personal development for individual staff and the establishment of faculty-wide priorities. The staff appraisal system was used to support staff in engaging with five established stages in ICT training. This was described as "*effectively compulsory*" reflecting the minimum skills level required of everyone and also enabling access to their relevant course areas on the Blackboard VLE. Faculty priorities for enhanced use of the VLE were clearly articulated in policy statements, so there was integration of personal professional development with wider institutional aims. The annual appraisal cycle was not sufficiently responsive to ongoing ICT needs to encompass all planning, however. There was a recognition that "*training needs come up more often than the appraisal system can manage*" with provision made for such requests, as well as "*regular technology updates*" for all staff. Overall, it was felt that the initial time and expense involved in adoption of ICT was justified in terms of the potential it offered to support and improve learning.

At a third university training was currently optional for staff, and it was reported that the VLE was used infrequently in the Art and Design faculty compared to the other two faculties in the institution. However, there was extensive use of ICT for learning *other* than VLE use, and we can assume that a perceived problem in its meeting subject specific needs was the demotivating factor here. Nonetheless, the institutional culture supported use of core technologies and ICT use was so ubiquitous that it had become the main means of information sharing and communication among faculty colleagues. There was a real danger that anyone without computer access (even temporarily) would be operating outside of this information loop –

“In terms of communication ... yesterday somebody didn't turn up because their email wasn't working and they didn't know there was a meeting. We're so reliant on communication with computers.”

This example indicates that cultural pressures can work to overcome the 'optionality' of ICT training, providing a 'non-strategic' but effective motivator for staff to gain the skills required for everyday communication and survival. The lack of an articulated strategy for continuing professional development in e-learning was about to be rectified, however, with respondents reporting that following recommendations from an external examiner such training was “going to become 'less optional' fairly soon.”

Following the money ...

It was not possible to determine any fixed pattern of institutional arrangements for staff development in ICT, although the trend seemed to be for an increasingly prescriptive approach to this on behalf of employers. There also appeared to be a growing role for centralized units which had a remit to develop learning and teaching within institutions. Several tutor respondents discussed the ways in which expertise, and funding to allow teaching remission and purchase core technologies had been provided through these developmental 'hubs'. The support provided seemed to have been context-sensitive and pedagogically informed about the potential and implementation of e-learning, and to be welcomed by tutors. It is likely that the existence of this kind of support is predicated upon the 'ring-fenced' funding provided by HEFCE for learning and teaching developments, and it appears that art, design and media tutors are claiming their fair share of it.

Sharing professional experiences

An important motivator for ICT use among tutor respondents related to the potential for importing technology applications used in professional life into the educational context. This aspiration was strongly stated for curriculum areas such as photography, media studies and graphic design - all highly technologized practice fields. One example came from a photography and video course leader, who described new patterns of exhibition viewing –

“Recently ... I screened a video in a gallery ... and it was a completely different experience because with photographs a couple of people tend to be looking at your prints and then they wander off, whereas with this everyone was looking at your work at the same time.”

- an experience that illustrated the potential of shared technologies to break down barriers between professional and educational contexts and for “... professional experience to be brought into teaching practice...”

Strong motivators to ICT use were also seen to lie in the more general benefits to learning and teaching that came through increased access to resources, ease of management of administrative tasks and students' familiarity with relevant specialist software. These will be discussed below when e-learning itself is considered.

- **Equity and access**

This theme emerged strongly from the focus group comments made by respondents, and had several dimensions. These included the potential of ICT to address disadvantage, the equitable provision of support and training and the technological barriers experienced to ICT access/use.

Addressing disadvantage

It was reported that extended provision of module resources was enabled by the use of the VLE's as repositories of information (and it should be noted that it was mainly Blackboard that was being adopted). This had particular resonance for some groups of students, particularly those who found it difficult to develop more traditional academic skills. While all students appeared to benefit from the more relaxed atmosphere prevailing in lectures once the burden of extensive note-taking was removed, this was a very important move for dyslexic students. It was also helpful to tutors, one of whom described his previous situation in lectures of having "...a battery of tape recorders in front of me.", a situation which most people who have encountered it recognize as intimidating. Not only were printable copies of notes and other information provided but other channels of communication than print were employed, allowing mixed media presentation with video and other visual material. Practical sessions involving video recording of 'hands-on' workshops and engagement with materials were also available as video recordings. The benefits of this are likely to go beyond the advantages offered to dyslexic students, providing opportunities to reference a wider range of learning styles and learner diversity.

Other views on this issue were offered, however, with one tutor noting that art and design students in experienced particular problems with literacy, and that they might find the predominantly written modes of IT communication difficult to address –

" ... not that they're less intelligent, it's just that they have skills in other areas that are stronger ... some of them will be great in seminars ... I think that because we are humans and communication verbally and orally is natural, perhaps there will be things we lose with digital environments."

Student comments on the provision of ICT for those with disabilities agreed about the valuable assistance this could give to students with dyslexia. However, it is clear that the system for accessing such resources needs careful management, as students voiced concerns about the potential for abuse of a system where free resources were provided. Some said they believed that abuse did occur, and that the money could be better spent in other ways.

Equitable provision of support and training.

Issues relating to accessibility for tutors as well as students were voiced. Sometimes there was evidence of shared aspirations for ICT upskilling, as in one institution where staff and students were unanimous in their wish to become more skilled and knowledgeable about computing. This spanned a variety of activities, including use of software and hardware - "*I wish I had more time to learn to use a Mac properly*" – and, on behalf of staff, a wish to understand the "*...background info and pedagogic theories re. e-learning....*" It was significant that users felt that more 'human' support was preferable, or wished that computers could at least take on some of the human characteristics of "*helpfulness*", "*niceness*" and "*understanding*" that would enable them to develop their skills.

The inclusion of dedicated computer training in plans for staff development, especially where verified as part of appraisal schemes, seems to have ensured equality of access to ICT for staff working in those institutions. Best practice involved the ongoing provision and updating of hardware and software, which was attended to on a regular basis for full time staff. It appeared to be the case that in some contexts staff roles had a strong influence on ICT access; for example, "programme leaders" and "personal tutors" were specifically described as recipients of laptops in one institution and it was also recorded that staff new to the institution receive these. However, there were also contexts where the lack of clearly articulated expectations for professional development in ICT had led to a very patchy picture in terms of the overall expertise of tutorial staff. This was not necessarily because tutors lacked aspirations in the area, however. One respondent was at pains to stress that technological inexperience and little evidence of e-learning experimentation on the part of individual tutors should not be equated with lack of interest in learning and teaching. She described the attempts of some colleagues to deal with ICT as a "real

struggle” that should not be viewed as professional complacency. She also noted that the process of gaining and using such expertise was a significant addition to workload –

“It looks like a lot of extra work. Part of me wishes I could do it, but I’m a bit scared ... because of the work that will be involved ...there are a lot of people who are just like me, or even less versed [in ICT] than I am ”

The problem of workload accumulation was also discussed by tutors at another, with comments that *“We accumulate more responsibilities and more work because of the technology.”* and that *“... the biggest problem [in ICT use] is getting time to set it up.”* Some of the perceived benefits of e-learning were thus assumed to be in store for the future, while the current situation was characterized by the difficulties of accommodating up-skilling and resource-building into already crowded schedules. Problems of time, skills acquisition and workload were seen as significant barriers to e-learning development and it seems sensible to suggest that these can only be addressed in relationship to institutional infrastructures. It also appears that institutional strategies for e-learning need to be articulated clearly at all levels if individuals are to understand and act on the contributions expected of their individual roles.

Another issue about staff training emerged that is of particular relevance to the subject sector. The high ratio of part-time staff teaching in many art, design and media courses was seen as significant in e-learning terms in its impact on the respective technological access afforded to full and part-timers. Full-time staff tended to be the majority of respondents in the study, but they noted that up to 50% of teaching colleagues were part-time. They voiced concerns that part-time colleagues were frequently not offered computer access by institutions, and as they often failed to check emails on internal networks communication problems arose. Even where there was evidence of clear policies to provide all full-time workers with ICT access, it appeared that this was not regularly extended to part-time teaching staff.

Technological barriers to ICT access and use.

Barriers to tutors pursuing effective e-learning strategies related to the complexities of the technology involved, in particular to the multiple components that needed to be mastered in setting up an electronically-enhanced learning environment. Fear of lacking control over resources was cited as a reason for avoiding innovations in teaching, and one tutor looked forward to a time when all the learning technologies within the classroom could be fully integrated, rather than the current situation. Tutors reported that currently they had to deal with a laptop, finding a phone point to plug it into, obtaining the correct wires and leads and so on, often in rooms with which they were unfamiliar– *“If we just had to learn how to use one thing!”* Complexities of a different kind discouraged even the more technologically-oriented because of the plethora of computer operating systems available. Incompatibility between systems was a key disincentive to ICT use, with the lack of interoperability between PCs and Macs providing access problems for many student users. It was suggested by respondents that voluntary networking of personally owned computers and easier, wireless internet connections could offer desirable solutions. Visiting lecturers provided a particular problem to full-time tutors in respect of the compatibility of their personal resources with institutional ones; for example, one programme leader found that the CVs they sent in frequently could not be opened without *“going to the IT man”*.

It was clear that more recent developments, particularly the adoption of institutional VLEs (again, it was notably Blackboard), had simplified ICT engagement for staff. In one university the uploading of information onto a previous VLE had involved tutors having capability in HTML applications and required either *“...web training or support to help them put up the information [which] was too cumbersome for the needs of the art and design faculty”*. Technological innovations had thus bypassed many of the skills formerly demanded of tutors in the performance of similar tasks and allowed them relative ease of access – a process that we can anticipate will continue. In most contexts the technological infrastructure continued to develop to accommodate new demands, as

in the introduction of a wireless network seen as a particular benefit by staff. This had helped to overcome earlier barriers to effective ICT use, including "... *teething problems such as not having enough cables to connect to the internet to check your emails.*"

Students experienced the introduction of ICT as beneficial to their learning, making regular use of information held electronically. However, they reported their experiences of finding parallel sites holding relevant learning resources, which had different modes of gaining access. For example, in one institution students reported that information on "*the server*" could only be accessed from within the college, while that on the Blackboard VLE could be accessed from home. However, this group of student respondents recorded that they did not use the 'official' VLE much – "*We just go through a file system on the server*", an inconsistency in information access that seemed to be subject-related. This instance pointed to an important issue that seemed to be related to the degree of subject-specificity of learning resources, and students noted that for their course the main "*wealth of information*" was server-housed and that tutors directed them to these by including their details in assignment briefs. There was a practical reason for the 'housing' of materials on the server, and this related to the space allocation required by art, design and media students. Students were each allocated 750mgb of space on the intranet in order to store their work, which accounted for their propensity to favour it as a file storage system. In light of this, the storing of briefs and other resources here was a logical choice, despite the restrictions on access involved.

It will be important to consider these subject specific needs as we move further towards electronic and blended learning environments, and to include such requirements in institutional plans for digital accommodation. The financial investment needed to support innovation was a related theme, and these costs were seen as the main barrier to technology access at one university. The nature of the subject areas undertaken made updating a particular problem, and it was noted that "*Faculty budgets need to expand to keep up [with technological advance].*" Issues about the quality of student work were directly linked to this financial investment by respondents, and they noted that "... *the link with quality is origination. What are students using to take photographs in the first place? What printers are being used to produce work for exhibitions?*" High quality, high investment technologies were thus seen to be required at all stages in the process of student work, with results highly dependent on access to the correct equipment.

A similar theme about perceived relationships to specialist art and design needs emerged in student comments on access to technical help. Despite the acknowledgement that several routes to this existed in institutions there was a distinct preference for securing support from those with subject expertise. Students provided one another with extensive peer support, confirming that they solved most of their software problems by talking to each other. Beyond this, lecturers were the first port of call for additional help and then "... *technicians based in art and design...*", while none of the six student respondents in this group had ever contacted the general "*technical help desk*" that served the whole institution. It appears that the art and design context both posed the problems to be solved by students and provided the specialist expertise to resolve them.

A wider picture ...

Focus group discussion at one institution made strong reference to issues of equity and access to ICT within and beyond the confines of the university itself. It was regarded as important to educate university members and other users more fully in "*responsible*" use of ICT and to consider the ethical issues around access to computers across developing countries. Comments on this point focused on the need to recognize the "*exclusion*" of those without ICT access and for the privileged, technology-rich nations to share resources with others. They also included environmental concerns connected to the consumption of electronic resources, as in the need to

develop better forms of “*biodegradable technology*” and to give serious consideration to whether the current pace of development was sustainable – “*You really need to weigh up what’s needed.*” This issue of the importance of determining “*need*” over “*want*” was a theme picked up elsewhere, and it was considered that a balance needed to be maintained between finding the best uses for computing versus making ‘blanket’ use of ICT whether appropriate or not; this was seen as an important issue in the planning of learning activities, which could disadvantage some people if exclusively envisaged as technology-based. The seriousness with which all of these issues were discussed indicated that ethical debate on technology issues was a priority for both staff and students in art, design and media.

- **Perceptions of learning and the impact of e-learning**

A number of key issues emerged from respondents’ comments on their views of learning and their descriptions of the key activities and preoccupations that engaged them in its pursuit. These included insights into the ways in which knowledge was managed, developed and distributed in their settings, and how this was aided and constrained by ICT. There were also significant comments on the relationship of ICT to subject specialisms and to the skills and understandings required for these fields.

Archiving and resourcing

Students were described by tutors as benefiting directly from the information-handling capacity of ICT in general and the Blackboard VLE in particular. Although not explicitly referenced, a cognitive or ‘symbol-processing’ perspective on knowledge and learning frequently appeared to be adopted by tutors. They therefore envisaged the positive capabilities of ICT software as enabling the “chunking” of information and subject knowledge, although they simultaneously held a wider picture in mind than just the idea of learning as a form of data processing. For example, the ease of information storage and retrieval enabled by VLEs were predominantly valued for its ability to provide learners with a flexible and accessible repository of relevant resources. Tutors frequently expressed satisfaction with the expansion of resources and archiving of knowledge that they were currently achieving, and they viewed this as a crucial means of supporting learning. They also indicated their implicit belief that traditional views of knowledge ‘transmission’ could be well served by new technologies; for example, one tutor expressed satisfaction that electronic archives of resources that were of benefit in “... *successfully passing on knowledge to students, but using technology to do it...*” and saw the portability and instant access to these resources as especially valuable. This enabled a new level of immediacy and responsiveness in teaching, which was described by several tutors –

“... using digital projectors and software such as Powerpoint or iPhoto, you’ve got your whole slide collection with you the whole time ... People ask you a question [and] you can demonstrate it immediately. That’s a huge bonus.”
(Composite tutor comments)

The discussion among tutors and students at Institute D confirmed that views of the term ‘e-learning’ were predominantly shaped by the idea of enhanced resources being available. Although seen as superior in range and accessibility in comparison to traditional libraries, the idea of the ‘e-archive’ was the main point of reference, as the following comments illustrate:

“E-learning is essentially a library”

“Libraries and books are getting out of date ... e-brary”

“It’s a virtual library. You can have all the Harvard referencing.”

Tutors believed that the demotivating effects of unsuccessful library searching in the past, where students “...*come up against a brick wall...*” that leads to their disengagement with learning, had thereby given way to a more positive situation, with one commenting that -

"I'd like to chunk things [information] further. The benefit of that is that I envisage using Blackboard as a repository whereby you could present a student entering onto the module with sufficient information for them to be able to engage fully...."

Students associated these new repositories of knowledge with their ability to gain autonomy in learning, although their accessibility and value was enhanced where tutors had pre-selected a range of relevant resources to which students were specifically directed through assignment briefs. These were regarded as very valuable and included examples of earlier student work for similar assignments, resources such as video clips, links to websites and storyboards. Access to them was seen to allow for a new independence in learning - *"... so you don't usually have to trouble tutors for much."* A project in one institution had enabled new perceptions of technological potential to develop, explained by a student as follows -

"... [the interactive whiteboard] it's just used as a projector more often than not. The actual interactive part, we don't use ... but my project is to design a working interface for a touch-screen booth, so I'll use the interactive whiteboard to show how that would work."

Here the integration into project work of new technologies allowed for creative innovation and development of new applications, as well as a fuller appreciation of an existing resource.

In one group students voiced requests for additional e-learning resources, with a particular demand for lecture notes to be made available on 'their' server. They recorded that *"... there are other courses where all the lecture notes go onto the server."* but said this was not the case for them. It seems likely that this problem was related to the fact that they were accessing a different platform from other students, in that ADM students had good practical reasons (notably that of server 'space') for regarding the institute server rather than the VLE as their electronic 'home'. However whether lecture notes were available on the VLE, server or elsewhere, such comments were fairly common and substantiate the need for service integration and the desirability of providing single access points to resources. This was underlined by the clear rationales that students gave for having online repositories of learning materials. The first related to flexibility and independence in learning, with a comment about the desirability of lectures being a time-shiftable resource - *"There are times when people can't make it to lectures"* - and the second supported points made in other groups about the desirability of deepening understanding rather than honing recording skills - *"I can't write and listen at the same time, so audio [archives] would be best."* Both of these aspirations appear to accord with current trends in higher education, and can be technologically assisted in the ways that students recognized.

Other than resources that archived specialist subject knowledge, tutors also referred to electronic resources that support learning in more generalized ways. For example, they described the potential of e-learning to enhance students' access to course information such as module and course descriptor documents, particularly through VLE use. In one context they outlined plans to extend current use of ICT by keeping computer copies of *"individual learning plans for students"* and other personalized files. Although a move to 'online' tutorials was still anticipated for the future, *"recorded tutorials on their laptops"* were currently a favoured form of tracking student progress here. Learning was seen to be substantially supported by the potential for enhanced communications at all levels, from institutionally to internationally. Staff therefore exploited the 'notice board' and other communicative aspects of ICT, as well as the administrative and managerial opportunities provided in software such as *"planning tools, [for] calendar and workflow"*. In these descriptions there was recognition by tutors of the ways in which diverse technologies supported different aspects of learning in art, design and media higher education, and they adopted a critical perspective on ICT tools as commodities serving the functions of diverse markets. The PC was described as *"a personal, individual commodity"* (despite its saturation of the lucrative education market) that promoted administrative, archiving and publication functions, while the Mac computer was seen as a crucial resource for more vocationally referenced learning.

Developing and distributing knowledge

Teaching staff across all contexts demonstrated clear perceptions of the capability of e-learning to change learning interactions and relationships. For example, one tutor at Institute F commented that

“To me what underpins e-learning is switching an emphasis from knowledge that’s held by teachers who teach, to the sharing of information where people learn because they interact with the information. And that philosophically is a massive shift, and it’s also where the biggest resistance comes.”

It was evident that there were different degrees to which this shift had taken place in the respective institutions that informed the research, and that the ‘blend’ of traditional and technology-enabled learning was individual to each. Tutors agreed that *“The uptake of e-learning seems to be patchy in art, design and media”* (comment at Institute F), a diversity reflected strongly in the research data. For example, at Institute A different patterns of engagement between tutors and students were reported as having developed as a result of the introduction of e-learning. However, e-learning was envisaged here as supplementing established activities such as seminars, lectures and tutorials, with no loss of face-to-face interactions reported as a result. Indeed, among the positive effects of ICT on students’ learning it had been noted that there was increased attendance at face-to-face sessions, and that students showed enhanced proactive engagement with discussions in the course of these. One tutor believed that students studying the modules he taught were engaging more fully than previously with the range of resources he supplied –

“When I used to hand [articles] out as a photocopy hardly anybody used to read it and hardly anybody brought it [to the lesson] ... on Blackboard I was really surprised that the vast majority of them had read and had all copied it. I think it’s something to do with the fact that they know you’re actually doing something for them so they feel that they’re engaging.”

It was also reported that with the pressure of extensive note-taking removed from lectures all students tended to show increased understanding of the issues discussed, asking more questions in subsequent face to face sessions and referring to more complex ideas in work submitted for assessment. One tutor reported “better seminars” in terms of increased participation in discussion and in students’ improved critical review of ideas as consequences of opportunities offered by e-learning.

However even within the same institutions conflicting views prevailed, with different perspectives on learning leading to different perceptions of the usefulness of e-learning. Another tutor at Institute A, who saw learning as predominantly socially constructed, questioned whether computer use could adequately replicate this social experience. The loss of “...*the human dimension...*” that she saw as present in face to face interactions and particularly in group learning activities was a matter for regret to her. Privileging collaborative learning and “...*knowledge built through interaction with others ...[as] more than the sum of its parts.*”, this respondent feared the loss of more subtle, implicit learning opportunities –

“...students who perhaps are weaker in the group suddenly have almost a light bulb come in over their head when they hear somebody else ask a question or answer a question ... You might get shy students who aren’t so socially adept, but if they’re able to take a back seat for a while and see students who are more ... adept, they might pick up skills. When they go for interviews or they’re mixing in with future colleagues in the workplace, they need to have these skills in place.”

The potential for loss of these ‘transferable’ skills led this tutor to feel ambivalent about e-learning. Although initially indicating that she preferred to restrict ICT use to the handling of “...*basic information, induction type information...*”, she agreed that it had the potential to make some face

to face sessions more effective learning activities, and reported her own improved practice as a result. These comments came in her reflection on the use of Powerpoint software, which she recognized had led to improved structure and coherence in her lectures. She believed that she had become more discriminating in selecting visual material for inclusion, which enabled her to personalize her lectures more and to *“...go much more into depth, more slowly and coherently ... I do realize I've improved so much from Powerpoint being the medium”*.

A pilot project in one institution was about to put some of the concerns mentioned above to the test; staff here described their involvement with a new master's course due to be delivered entirely online, which was seen by as likely to bring in other opportunities for innovation. It was also thought that it would help resolve other concerns; these included clarifying the distinction between e-learning and distance learning helping establish optimum levels of face to face interaction and determining whether the need for a physical learning space would endure – *“Decentralize the learning and the uni may not have to exist.”* One student involved in this discussion made a strong case for the need for continued face to face meetings with tutors, and made a significant point that international students may have a particular cultural requirement for this. It is likely that there will be variations across different student groups in this respect, and tutors voiced their commitment to using a variety of means and channels for their teaching – *“As a tutor I think you need more than one form of communication.”*

Another point that emerged here was the need to support the growth of digital communities as an evolving form of ICT engagement -

“In terms of emailing each other perhaps we could have less peer to peer and more community emailing ... less about 'MySpace...’”

and (presumably) more about 'OurSpace'. This type of communication was also seen as a way of reducing the 'burden' of increasing volumes of personal email. Further key issues that respondents agreed would support e-learning developments were identified as greater stability in platforms, interoperability and compatibility between different systems, increased speed and improved filtering devices for email. Students were also beginning to realize the importance of self-regulation in ICT use, with one establishing her own protocols for security, archiving and data management. These included:

“Save your work before. Start working from beforehand. Every week go for a virus scan.”

Students appeared to agree that in many respects ICT use brought learning benefits, and the familiarity with computer technologies that they described as part of their everyday lives and leisure stood them in good stead in dealing with new means of interaction. This technology-readiness meant that for some aspirations outstripped reality; they were dissatisfied with university ICT provision and commented that their expectations of access to 'state-of-the art' technologies at college had been unfulfilled, particularly in terms of the 'speed' of internet and server use. However, they generally seemed to be making good use of the facilities provided. For example, one group described the routine use of email in communications between themselves and tutors, and saw this as having the potential to support group work –

“When we've got a piece of work that we're all working on as a group, then usually if I have an idea I'll email that to the tutor and he'll distribute it to everyone else in the group.”

Email addresses were not shared between the group (this may have been because of data protection concerns, and staff anticipated that all students would have college email addresses in the near future) the tutor had to act as a central distribution point for ideas contributed by different group members. As this probably involved an unnecessary increase in tutor workload and a barrier to spontaneous communication of ideas between students, the aspiration to redress the situation for the future was merited. Generally it appeared that the flexible means of communication

between staff and students offered by email was being exploited, although there was concern that in this technological use, as in others, students sometimes needed to be motivated to use the email system. Lack of engagement with emails could usually be seen to lie in the nature of their content rather than in students' technological inadequacy or apathy, as one tutor noted -

"A lot of [colleagues] say it's no good emailing students because they don't look at their emails. My argument is that ... [it's] because the stuff that people give them is really dull. They're all fantastic at using mobile phones so I think that it's a complacent myth that they don't or won't use technology. It's when it's worth their while."

Elsewhere there were instances of students using a sophisticated mix of technologies within a blended learning environment. This example involved them in face to face meetings, the development and recording of work on an interactive whiteboard and the subsequent seamless transition of this resource to an online format. The technology involved was called the 'learning grid', and it had shown positive collaborative benefits. One tutor commented that -

"What it seems to do is encourage a very mature attitude to learning ... students organize learning groups. They book it out, a group of them to do a project. And they'll go and sit with their whiteboard and brainstorm, and do their project online as a group."

Technological interactivity was a key value pervading the positive experiences described, with expectations of e-learning being enhanced by demonstrations of good practice that staff and students had been involved in. One significant instance described by students had involved the use of podcasts and a webcam, and enthusiastic reactions led to the following comments -

"The best lecture I had was one with the director ... talking about the music production with the composer, using a webcam."

"I am converted to podcasts after that lecture."

"It was an incredible demonstration of the technology."

"It was all online. They were actually sending things backwards and forwards ... actually web conferencing; there was barely any face to face."

The benefits of this type of interactive experience being recorded were also noted, with one student commenting that *"With a podcast you can give the lecture the attention it needs. You can keep going back."* - sentiments similar to those found elsewhere in the view that learning technologies can relieve the pressure of 'recording' information, enabling more in-depth student engagement and understanding. One tutor was also about to pilot an online peer assessment tool, designed to support group activity as well as *"...save staff time and provide students with feedback they wouldn't normally get."*

Despite the positive experience of planned collaboration that students across different institutions reported, and the potential for developing distributed knowledge networks through group activity, some of them described a very different context in undertaking individual work - *"When we're doing assignments for our course which are all individual we don't really use it [i.e. email/forums]."* This situation pertained despite students' technological sophistication and familiarity with ICT, and provides some interesting insights into their perceptions of e-learning. It may be that the very 'everyday-ness' of communication technologies dissuades students from perceiving of them as useful tools within a formal learning environment. At the very least it indicates that the learning potential of familiar applications such as email and discussion groups needs to be clearly articulated for a context. It also appears that their use needs to be embedded in the structure of planned learning activities and that students' attention should be specifically directed to the applications that they are expected to utilize.

ICT and subject specialisms in art, design and media

There was abundant evidence that tutors and students made extensive use of ICT to pursue work in their specialist subject areas, and that the preferred hardware in art, design and media courses was the Apple Mac computer. This preference related strongly to the uses made of ICT, for example in using *“computer software for college projects – word processing, design programmes.”* (Student comment at Institute G). The support offered for essential software by the Mac was the main reason for its position as first choice of hardware, as was its ubiquity in professional design contexts. One tutor noted that –

“[the Mac] ... is the industry accepted kit. The software is better suited to that machine, it’s a more stable platform for software than the PC because they don’t crash.”

The software for which Mac computers provided this stable platform, and which was regarded as crucial for subject-specific ICT use, was the Adobe Creative Suite – i.e. Photoshop, Illustrator and Indesign. Students confirmed their shared expectations of using such software for art and design, which one summarized as follows –

“[I’m] using software like Photoshop, Illustrator, Powerpoint, Excel, Word, iMusic, iPhoto, scanning, internet and email”.

It was common for them to gain access to these applications in a college area dedicated to Mac use, in which resources at different levels of complexity were arranged; sometimes adjacent space for learning and teaching activities was also secured, as reflected in the following comment –

“At one end of the Mac studio are low level Macs and at the other end high-end ones ... the middle of the room has a cordoned-off area ... [providing] a flexible workspace.”

Some students reported that their Mac use was pursued in more distant technology suites that were shared with students from other courses, such as the “FLA, the Flexible Learning Area ... we go into it to use the Macs”, and many of them owned their own hardware and software. There seemed to be a mixed picture emerging in terms of how far ICT had been imported into core teaching spaces for art, design and media. This is unsurprising as the first wave of computer acquisition in higher education institutions tended to sequester these expensive resources together within dedicated technology suites that could be more easily secured, managed and staffed. There were clear indications, however, that core learning technologies were in the process of being distributed across institutional space and increasingly integrated into established teaching areas; some teaching staff still voiced this as a distinct aim, while others had moved closer to fulfilling this aspiration.

It was reported that students regularly and extensively undertook work in their own homes, an important learning environment for them and one which may be seriously under-researched. Problems of compatibility between home and college computers often interfered with progress, as comments by frustrated students illustrate –

“I don’t really use the college computers at all because I’ve got my own laptop at home ... most of [them] are Macs [so] there’s not compatible files with my one at home.”

“I use PC’s because I prefer them anyway but then its just the effort of ... I can’t save it [Mac work] on my memory stick because it’s only compatible with PC’s so ... it’s just a hassle.”

In terms of tutor use, indications emerged that PC’s were predominantly serving administrative, course publication and research functions. These were used to support learning in more general terms - for example, *“email, spreadsheets, letters, reports, internet, intranet, research”*. The other major activities supported by tutor use of PCs related to ‘student-tracking’ activities that have both a record-keeping and developmental aspect, as part of the agenda for personalization of learning coming through personal development and planning activities. Conversely, the ‘industry standard’

tools enabled by Macs served to deliver the specialist, subject curriculum which in art, design and media has clear vocational references. One student expressed the dichotomies of the situation as follows –

“There’s Macs and PCs and I can’t understand why there’s not one personal computer that does everything, and not ... Macs are just for design and PCs are more on the business side.”

Learning was also being pursued by exploiting the potential of multimedia technologies. There were numerous instances cited of students being introduced to the work of eminent and less well-known practitioners in this way, and these opportunities were especially valuable in enabling them to hear the professionals in question talk about their achievements. For example, a multimedia resource for jewellery and fine metal working provided “... *short clips of artists talking about their work. We’re using it as part of an e-learning resource that’s going to be a DVD.*” Course staff working within institutions were also using multimedia applications to improve the delivery of practical skills sessions –

“If you’ve got a face to face situation with thirty students crowded round one area where you’re doing a demonstration, 75% of them are at a funny angle, don’t see it, are standing behind someone. But with an overhead camera filming in a mirror on Moodle [VLE], that student can go to look at it any time they want to.”

Tutors in the study noted that the uptake of e-learning, and of computer use in general, was unevenly spread across the wide range of art, design and media disciplines. In one institution it was noted that media and visual communication courses had taken most advantage of the opportunities offered; however, in some fields the available technologies had by no means proved their worth in supplanting more traditional materials and means. Fine art was one instance cited –

“There’s virtually no e-learning in fine art. Theory that supports fine art, yes. But in terms of fine art practice, studio based practice, I’d go further and say there’s quite a high level of resistance. The potential hasn’t been explored.”

It was difficult in this inquiry to account for the situation in specific subjects, due to their range and variety; further research will therefore be needed to substantiate such impressions. However, it is sensible to assume that progress in adopting e-learning will be delayed where available technologies fail to match a subject’s core aims, media and outputs. Incentives for technology use have to be apparent to users, and may not be so evident to those in fine art and related areas.

Having said that, many of the advantages that tutors perceived in ICT use related to enhancement of capability in symbolic representation, for example in the ability of software to support learners in constructing “*projections into the future*” and virtual prototypes of their designs. This kind of digital representation facilitated the design process by synthesizing the diverse areas of expertise once required to develop design prototypes, cutting down

“the production process in general ... the transition from hand done to computer based design ... from fourteen people handling an exhibit to two.”

and providing opportunities for fine-tuning of designs that were previously unavailable – i.e. “... *the ability to change and tweak endlessly.*” and “*just to make it visually better.*”

There were particular benefits noted where the technology related to specialist or niche concerns, as in the description by one media tutor of an audio application –

“This particular thing I was teaching, ‘dither’ - being audio it was very difficult to teach because it’s just this really tiny analogue sound and you can’t see it. But I found all this stuff on the internet where people had taken all these audio examples, pictures of the dither, audio examples of the

dither, and I collected all this stuff together and it was just brilliant. I thought, 'I can really teach that well now.'"

The idea of 'dither' may be unfamiliar to many of us, but it is clear from this example that the tutor had found resources that supported his effective symbolic representation of the concept to students. A useful crossover of sense-based channels of communication also appears to have been effected, as noted in his further comment that, *"This was particularly interesting because it dealt with the issue of tactility, obviously an intrinsic problem with trying to teach audio."* The development of effective means for representing tactile experience in the digital domain is a significant challenge for e-learning in art, design and media, and local innovations such as these provide an important contribution.

However, even the 'matching' of technologies to subject specialisms brought concerns as well as opportunities for respondents. Despite recognizing how subject-specific innovations could support learning, tutors and students voiced ambivalence about their impact on art, design and media fields. Most of the potential benefits were recognized as functions of software that had been developed for industries that were intended student destinations on these predominantly vocational courses. Conversely, significant threats to the quality of learning and student achievement related to the dilution of subject specific skills, and this was seen to be exacerbated by the 'mass' availability and more general use made of such software.

Tutors' perceptions of the disadvantages associated with ICT use involved concerns for the quality of student achievement in specialist areas, and the potential for student under-skilling as a result of technology dependence. They recorded their views that *"technology introduction into studios and courses had ... devalued work ..."* and these concerns related both to the quality of student achievement and to the decreasing pride in their work that they perceived students to take. There was some disagreement and debate about this however, with photography and graphics tutors in particular voicing worries about the issue of *"...standards ... slipping as a direct result of the technology ..."* Problems were seen to relate to students' unrealistic expectations that technology would 'do everything' for them, to their lack of background in and understanding of traditional processes at the core of disciplines (e.g. darkroom processes), and to the constraints that an exclusively digital range of activity might promote – *"There's an issue in graphic design that the screen will define a student's entire graphic design experience."*

Technicians and lecturer/technicians were less convinced that these issues were an outcome of technology advance, however, pointing out that, *"I don't think that's actually the fault of the technology"*, and that *"[the computers] ... are only as good as the person that's operating them."* Agreement was ultimately reached within one focus group that courses needed to promote a more 'professionalized' use of ICT to students by providing the *"skills bridges"* needed for them to operate as specialists, an activity that also involved *"honoring the raw availability"* of technological applications. This was seen as crucial in enabling students to gain professional levels of expertise in the current context, where -

"... anyone has access to the technology now, and that is reflected in what is being produced by the students... whereas previously it had been used to teach a very specific vocation that used equipment unavailable to the masses".

There was evidence that this was a topic on which tutors and students were in agreement. For example, several students at Institute G commented on the capability for ICT to *"ruin things"* within their specialist fields by providing consumer software that replicated the skills that were once developed by subjecting existing 'talent' to intensive training. It is worth recording a few of these comments here to indicate the depth of feeling that the issue raised:

“...[software like] the Illustrator files ... means that anyone can do it, and I know that that’s the appeal, but if you’ve got a talent for it ... and if everyone can use these programmes ... then what’s the point in having a talent?”

It’s like losing your handwriting, losing your style – everything becomes homogenous ...

Someone that can’t draw a twig is becoming the best fashion illustrator out there...

I’m all for making things easy, but it’s taking the joy out of some things.”

Not only were non-artists and non-designers edging into specialist fields, but students felt that more traditional skills and their own innate talents that were unrelated to computer technologies were being undervalued. One student gave a telling example:

“We have the people that are very good at doing the flats hand-drawn and they’re told – I mean I understand for the course that we have to learn it because it’s so in fashion to use computers and we’re moving forward – but people who are naturally good at doing the flats, then they have to do it on the computer and they struggle. They get bad grades and they don’t perform as well as what they’ve got naturally. And I think there should be more choice and there should be more openness to not having to use technology for everything.”

In considering these comments it is important to clarify that the context in which students were speaking was one in which most of them had willingly adopted ICT use for leisure and work-related activities. They were by no means ‘e-luddites’, and many had expressed positive sentiments about the personal acquisition and use of new technologies. The level of concern exhibited indicates the serious commitment that students in art, design and media brought to their studies, adopting a critical and questioning stance on their new technological situation. Maintaining the distinctiveness of specialist skills against this background, and in highly technologised subject areas, was a challenge that tutors and students had jointly identified and were preparing to face.