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**Understanding students' (non)use of information and  
communications technology in university**

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# Understanding students' (non)use of information and communications technology in university

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**Abstract:** Six years after the Dearing Report's call for IT to be established as a 'key skill' throughout university curricula, overall use by university students remains inconsistent and often 'low level'. This paper therefore presents an overview of why students do - and perhaps more importantly why students do not - make use of information and communications technology (ICT) in university settings. After briefly considering established social science explanations concerned with material or cognitive deficits on the part of the individual, the paper offers an alternative, sociologically-focused explanation rooted in the theoretical premise that technologies are socially shaped. From this basis the paper presents a synthesis of empirical evidence suggesting that students' (non)use of ICTs is complex, fluid and ambiguous - guided by pragmatic and strategic concerns over the 'goodness-of-fit' with their academic and non-academic lives. The fact that sustained use of ICT remains neither advantageous or is required in many academic situations leaves students in little doubt over its place; at best a short-term criterion to fulfil and 'box to tick' before commencing with the 'real' part of their studies. The paper then considers how ICT may be more meaningfully integrated into university curricula - offering three different scenarios for future practice.

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# Understanding students' (non)use of information and communications technology in university

## I - INTRODUCTION

The rhetorical prominence and importance of information and communications technology (ICT) in higher education continues to grow year by year. It has been nearly forty years since it was first asserted that use of information technologies such as the computer would be *the* defining feature of higher education (e.g. Suppes 1966, Luehrmann 1971) yet visions of 'virtual universities' and 'cyber-classrooms' continue to proliferate the literature (e.g. Tiffin & Rajasingham 1994, Howe 1998) with little sign of abating. Indeed, if current proponents of the information revolution are to be believed, then university education is inevitably following the lead set by business and industry into a computer mediated 'meltdown':

“Developments in multimedia, increased communications and other ICT innovations are obviously key components of the information society. In this new era, managers must be prepared to abandon everything they know - and the same may hold for teachers, educationalists, researchers, students and policy-makers. Maintaining the *status quo* is not an option” (Gell & Cochrane 1996, p.254).

Of late the academic and political debate over ICTs and higher education has shifted away from classroom concerns towards a more macro-economic focus on the redefinition of the higher education 'institution' in a globalised 'knowledge' economy (Leadbeater 2000, Marginson & Considine 2000). How new technologies are prompting the managerial and commercial reshaping of the global 'business' of higher education as well as reshaping and recommodifying teaching, learning and administration in universities is currently the primary focus for many commentators (e.g. Robins and Webster 2002, Dutton and Loader 2001, Selwyn 2004). As Clegg *et al.* (2003, p.41) summarise:

“ICTs are presented as co-terminus with the mechanisms of globalisation and with this comes the need for new forms of labour power. ICTs are both presented as cause and a consequent driver for change within Higher Education. In line with classical neo-liberal economics which denies that the market can be challenged, Higher Education must change to meet the challenge and in doing so

provide the skilled labour that gives the national economy a competitive edge in the global market”.

Much of the present imperative for ICT use in HE settings therefore derives from these global-economic matters. The pivotal role of the university in producing the levels of human capital required for countries to succeed in the globalised ‘information economy’ has been expressed in terms of higher education’s ability to provide the labour market with information-aware and information-adept graduates; i.e. the ‘symbolic analyst’ cadre seen by Reich (1992) as the driving force of twenty-first century capitalism. In this way, the present emphasis on developing ‘information-literate’ graduates can be seen as fundamental to the longevity and survival of higher education and the growth of the ‘post-modern university’ (Webster & Smith 1997). As Breivik (1998, pp.1-3) argues:

“the seemingly abrupt dawn and speed-of-light growth of the Information Age threatens the very existence of traditional higher education ... To address th[e] new definition of an educated graduate, higher education must step boldly forward and acknowledge the fact that the traditional literacies accepted in the past as sufficient for supporting a liberal education are now insufficient. In fact, information literacy must be added to the other literacies because students must be information literate to stay up-to-date with any subject in the Information Age!”

Although important these political and economic matters seem, of late, to have deflected sociological attention away from more prosaic issues of how individual students may be using (and not using) ICTs during the course of their time in higher education. As Naidoo (2003, p.255) observes, “analyses which are pitched at a macro level, and which exclude the inner functioning of universities, have tended to define sociological work on higher education”. Thus much time and attention has been spent agonising over the emergence of private sector ‘e-universities’ and the role of the university in the knowledge economy with the implicit assumption that current and future cohorts of students are able and willing to using ICTs during their studies. As ever with ICT, older generations of academics and decision-makers have a tendency to see younger generations of learners as somehow being innately disposed to technology use - a ‘keyboard generation’ raised as they have been on a diet of video-games at home and an IT-centred national curriculum throughout their compulsory schooling (see Selwyn 2003). Indeed, one of the main apprehensions of early advocates of educational computing in higher education tended to centre around the concern that undergraduates may fall too deeply ‘in love’ with the computer to the detriment of other aspects of their intellectual development (e.g. Evans

1979). That students may *not* be inherently disposed to use ICT during their studies is rarely a cause for concern.

Of course, one of the less celebrated elements of the higher education and technology debate is that students' and teachers' use of ICTs remains, at best, inconsistent. Although ICT has had a profound effect on the academic activities of (most) university faculty (Gregorian 1996, Okerson 1996, Fuller 1998, Mizokawa 1994) its overall integration into the day-to-day academic activities of university *students* has been less pronounced. Despite the seeming inevitability of the 'computerised campus' many of the predicted visions of ICT-based teaching and learning have been slow in materialising; at least in terms of *use* of computers by students. Despite universities' expenditure on computer resources increasing dramatically over the last decade, students' actual use of ICT has remained inconsistent and highly variable from course to course and institution to institution (Arnold 1999).

Indeed significant and enduring disparities in ICT use exist between institutions, subject areas and even between students taking the same classes. Although successful case studies and examples of 'best practice' abound within the educational technology literature, at a general level the use of ICT in higher education can best be described as sporadic, uneven and often 'low level'. IT in higher education has been described as a 'service subject' which many students do not engage with in a sustained manner (Reffell and Whitworth 2002) and, as Rowley *et al.* (2003, p.117) observe, when students do make use of ICT it is often 'low level' and ineffective:

"Students make a low level use of electronic information systems ... Search strategies do not suggest a very structured or informed approach ... This generation of students are accustomed to active promotion of products that others want them to know about, and are rarely encouraged to find things for themselves".

This picture of sporadic student use of ICT belies the substantial efforts that have been made over the past twenty years to ensure that ICT use does permeate into all aspects of higher education. In particular, spurred on by the success of the Joint Academic Network (JANET) and subsequent development of 'SUPERJANET', the 1997 Dearing Committee of Inquiry formally underlined the centrality of 'IT' to the UK Higher Education sector; recommending that every student have a laptop computer by 2005, points of internet access were provided in student accommodation and, crucially, IT was recognised as a 'key skill' throughout university curricula. These recommendations have prompted much laudable action by individual higher education institutions. University spending on IT infrastructure for students has also dramatically increased, with university library spending on

electronic and digital resources also increasing year on year (Sowden 2003). More recently, this momentum has been continued in the 'Future of Higher Education' white paper (DfES 2003) which outlined a university sector where e-learning is embedded into HE provision providing a diversity of provision which allows a wide range of students the opportunity to study on an 'anyplace, anypace' basis (DfES 2003).

Yet the gulf between these official visions and the day-to-day use of ICTs in universities is as prominent now as it ever has been. On one hand this is not necessarily seen as a cause for concern as education policymakers are perhaps less concerned with the minutiae of actual ICT use in HE than the short term 'gloss' that such proclamations lend to otherwise mundane policy documents. It can be argued that much of the recent political emphasis on new technologies and education serves to merely provide a tangible manifestation of New Labour's ongoing 'modernisation' project. Yet, if we believe that ICTs do have some merit in HE teaching and learning then finding ways of implementing the recommendations of Dearing *et al.* is crucial. The crux of this paper is that without an understanding of the social contexts of ICT use in higher education from the students' perspective little will happen to challenge the current *status quo* of sporadic and often mediocre use of technology. Whereas the IT community has been keen to live by the recent mantra that 'content is king' this paper contends that in the case of ICT use in higher education 'context is king'. From this basis the paper now goes onto review why students do - and perhaps more importantly why students do not - make use of ICT in university settings. After briefly considering established explanations from the fields of psychology, information and management sciences, the paper goes onto develop an in-depth consideration from the perspectives of the sociology of technology and sociology of education. From this basis it is hoped that a range of strategies can be proposed towards reconciling the rhetoric and reality of students' ICT use in UK higher education.

## **II - ESTABLISHED DISCOURSES OF (NON)USE OF TECHNOLOGY**

The questions of why people make little or no use of ICT has remained on the periphery of academic work on technology and society. Before constructing our own framework of non-use of technology it is therefore worth first considering existing explanations of non-users of technology that have become established over the last twenty years:

### ***i) Discourses of Material and Economic Deficiency***

It is agreed by many authors that the most immediate influences on individuals' engagement with ICT are economic and material. On a day-to-day basis the economics of using ICT is a crucial and on-going mediating factor, with some commentators seeing being a computer user primarily in terms of people "tak[ing] individual responsibility for the economics of getting on-line" (Haywood 1998, p.23). As Murdock *et al.* (1996) argue, material resources and economic capacity play a central role in determining (i) whether people use ICTs and then (ii) the nature and subsequent patterns of that use. The economics of gaining access are, therefore, an obvious prohibitive factor to students using ICT. The high cost coupled with a high technological 'churn' (i.e. constantly increasing specification) make using technology, for most people, a costly business. As Kling (1999) observed, the total costs of ownership of technologies such as computers has been shown to be a fraction of initial equipment costs – with training, upgrading and reconfiguration proving to be the major costs over time. Indeed, it has been estimated that the cost of purchasing a personal computer and relevant software is only 16 percent of the total cost of running a system.

Since there will always be differences in the ability of individual students to purchase technological equipment and lease the relevant accompanying services, in practice all universities see 'universal' access to ICT being achieved via the provision of open access and shared sites on campus. At these 'public' sites, shared access to technology can be made available to all at little or no cost. The range of public access in universities has grown from the traditional library and computer lab to on-campus cyber-cafes and more flexible learning resource centres. The key defining feature of these sites is that they all provide physical and supporting access to ICT in a social place aside from the students' home (see Liff and Stewart 2001).

Although universities are keen to expect that these facilities are used widely used by students there are indications that public ICT sites merely reinforce the existing patterns of students' ICT use in 'private' settings. In other words, public ICT centres may not be effective in actually *widening* levels of ICT to those individuals who previously were not using ICT but merely *increase* the levels of use among existing users. It is important to acknowledge the importance of an individual's 'perceived' (or effective) access in practice over the theoretical (or formal) access to ICT (Wilson 2000). Although in theory the formal provision of ICT facilities in university sites means that *all* students have physical access to that technology (in the same way that everyone has access to public payphones), such 'access' is meaningless unless students actually are aware of and feel able to make use of such opportunities. On a practical level previous research has also suggested that

public or shared sites are often not capable of fully providing comparable access to ICT as students enjoy at home; highlighting the subtle but important difference between access and ownership. Accessing on-line information and resources from a home-based computer or digital television set is not necessarily equitable to accessing the same materials via an open-access work station in a library or other public ICT centre. Issues of time, cost, quality of the technology and the environment in which it is used, as well as more 'qualitative' concerns of privacy, safety, conviviality and 'ease of use' are all crucial mediating factors in people's 'access' to ICT (Davies 1993). Thus sites such as libraries are not necessarily best physically designed for facilitating public ICT access (Lentz *et al.* 2000). As Rogers (2001, p.105) conclude, shared facilities 'can provide the public access function, but they need adequate computer facilities, adequate access time per user, and help desk facilities which were not [always] available'.

## ***ii) Discourses of Cognitive Deficiency***

Whilst material resources are obviously important many academics acknowledge that the difference between using and not using ICT is not merely a case of a simple 'equipment gap' (Krieg 1995). As highlighted in the psychological and human-computer-interaction literature there are also a range of individual factors centring around the cognitive and intellectual ability to use technology which are another set of enabling or disabling factors. Having the requisite skills and knowledge to use a technology are obvious factors – underpinned by an individual's experience of, and attitudes towards, using technologies.

Although not always conclusive (c.f. Kay 1990, Todman and Lawrenson 1992), academic research has regularly highlighted a link between experience of using a new technology and attitudes towards it. Loyd *et al.* (1987), for example, found a strong correlation between computer experience and affective attitudes towards computers, while other studies have also found a similar significant relationship between undergraduates' experience and both cognitive and affective attitudes (Durndell *et al.* 1987, Schumacher *et al.* 1993). From an intuitive point of view the link between technological experience and technological disposition would seem obvious, as the more a behaviour is performed the more that attitudes about it can be formed and reinforced. Todman and Monaghan (1994) suggest that individuals' initial experiences with computers, if favourable, tend to result in more positive affective attitudes. This effect was demonstrated by Miller (1994) who showed that primary school children's general attitude towards computers was significantly improved with only seven hours of tuition with the LOGO programming language.



Psychologists therefore point towards a range of cognitive and affective factors as important in determining an individuals' engagement with technology – such as perceived ease of use, self-efficacy, perceived behavioural control and perceived ability (e.g. Morris & Ventatesh 2000, Ellen *et al.* 1991, Ajzen 1988). The complexity of the relationship between causal factors and attitudes is highlighted by the numerous other psychosocial factors that have also been found to correlate strongly with attitudes towards computers. The link between attitudes towards mathematical ability and attitudes towards computers has been explored by many studies (e.g. Schmacher *et al.* 1993, Miller and Varman 1994, Shashanni 1995). Other studies have also revealed that peoples' creativity level (Offir *et al.* 1993), learning and social self-image (Katz 1994) and locus of control (Woodrow 1990) all significantly correlate their computer-related attitudes.

### **iii) Technophobia**

Following on from these general cognitive factors a distinct body of psychological work has emerged looking at individuals who make little or no use of technology. Constructs such as 'computerphobia', 'computer fear' and 'technophobia' now provide established accounts of individuals' reticence to use computers and other information technologies. Although exact definitions vary, the phenomenon of 'technophobia' is considered by social psychologists to encompass the fear and apprehension felt by an individual when considering the implications of using technology, even when it poses no real or immediate threat. In other words, technophobia clouds an individual's perception of the technology in question, making it appear somehow 'not for them'.

The vast majority of research has concentrated on the phenomenon of a 'phobia' or anxiety causing people to avoid using ICT in settings such as the place of study or home (e.g. Shashanni 1993, Colley *et al.* 1994). Thus individuals' technological 'reticence' (Turkle 1988) has become framed in terms of an almost irrational fear and stress brought on either by a lack of experience or a seemingly deep-rooted adverse reaction to the threat that ICT poses to the user (Brosnan & Davidson 1994). Such explanations are almost always based on the assumption that an individual's aversion to using computers is transitory and somehow 'treatable' (i.e. Kennewell 1992). Early studies in the 1980s estimated that 30-35 percent of all users experienced some degree of anxiety when they first used a computer. At the time some authors argued that technophobia differed little from the anxieties which have surrounded the introduction of other technologies throughout history – and that anxieties about using ICT would inevitably diminish as computers

become more commonplace. Yet, two decades on, research suggests that technophobia remains just as relevant. For example, recent studies indicate that technological anxiety continues to correlate significantly with individuals' characteristics, most notably gender and age as well as more obtuse characteristics such as 'left-orientated parts of the population' (Bauer 1995).

#### ***iv) Ideological refusal***

A fourth popular explanation of non-use of ICT focuses on people's supposed mis-conception of the enhancing nature of technology. No technology has achieved *absolute* permeation within the adult population, with 'universal' technologies such as the television and telephone only having coverage of between 90-98 percent of the population. This has led some commentators to contend that in the long term, the only people not using ICTs will be 'information *want nots*' – refusniks who for ideological reasons choose not to engage with ICT despite being able to in practice (van Dijk 1999). This non-conformist thesis portrays non-use of technology as an act of opposition against technology – usually by those who can afford to do so:

“The resistance against information technology is mostly local and a matter of 'intellectuals'; it is mainly informal, individual and passive, such as a refusal to work with computers” (Bauer 1995, p.19).

As this quotation intimates, technological refusniks are portrayed in an ideological light; resisting ICT in terms of implications for traditional patterns of work and life. Refusnik behaviour is also rationalised in more esoteric terms – especially with regard to aesthetics and humanist concerns. Sherry Turkle (1984, 1995), for example, points to some people's rejection of the 'anti-sensual' culture of computing and the linear, logical and reductionist nature of the 'modernist computational aesthetic'. Other authors have pointed to the aesthetic paucity of the on-line experience as opposed the offline 'real world' (Besser 1995) and the restriction of the expression of self within the confines of the structure of their programming (Miller 1996). This humanist thesis is typified by Norman (1993) who points to the clash between the 'hard' nature of machines and the 'soft' nature of the humans that are expected to use them. As Norman argues, the things that people are good at are the things natural to human kind, such as creativity, invention, empathy, and emotion. People adhering to these views and subsequently avoiding use of ICT are therefore deliberate non-users of technology.

## **v) Diffusion theory**

Finally, one of the most influential explanations of people's adoption of innovations can be found in the 'diffusion' literature (e.g. Rogers 1983, 1990, Grantham and Vaske 1985). Diffusion theorists point to a recurring 's-curve' of expansion of technology use in society from initial groups of 'early adopters' through to the majority of the population at a later date. Such writers have identified a succession of phases in the diffusion of innovations throughout the twentieth century – pointing to an 'inevitable' progression from 'innovators' to those individuals who are 'early adopters', through to the 'early majority', the 'late majority' and eventually those individuals who are 'laggards' (Rogers 1983). This model of progressive take-up of technology has proved especially popular in marketing and commercial settings leading to a variety of derivations; such as Mendoza's (2001) 'skaters', 'striders', 'sprinters', 'strollers' and 'starters'.

According to diffusion theorists, societal use of an innovation is hastened by its relative advantage – i.e. "the degree to which an innovation is perceived as providing greater benefits than the previous idea that it replaces" (Rogers 1983). From this perspective, new ICTs such as the internet are seen to have a high degree of relative advantage, as Rogers (2001, p.97) continues:

"Compared to postal mail, email via the internet is faster, cheaper and quicker. Compared to books or other sources of information, the World Wide Web is a more convenient means of searching for information (that is, if an individual has access to a computer and modem)".

This 'natural' diffusion (or 'trickle down') thesis can be seen as an elaboration of a technological determinist viewpoint that access to ICT inevitably leads to use. From a diffusion model perspective, non-users of technology are merely seen as 'laggards' (Higgins & Shanklin 1992, Wei 2001) or even 'defectors' (Kingsley and Anderson 1998). This somewhat negative positioning derives from the assumption that non-use and/or non-acceptance is an impediment to an innovation's saturation in society. From the diffusion perspective, a 'critical mass' of users is needed for the permeation of an innovation to accelerate (e.g. Oliver *et al.* 1985, Markus 1987, Rogers 1990). Thus, if individuals discontinue their use of an innovation this weakens the critical mass and eventually prompts an accelerated rate of defection (Markus 1987). Diffusion theorists therefore see non-participants primarily in terms of reducing the potential marketplace for ICTs – referred to as a problem of 'discontinuance':

"The significance of the defections is that they slow the growth of the Internet community and hence limit the size of the electronic marketplace ... At some

point it is possible that, in the developed countries, the majority of those not connected to cyberspace will consist of those who have been there and were not impressed enough to stay. This tends to lower the ceiling of the Internet sector of the electronic marketplace, unless the unimpressed can be won back” (Kingsley and Anderson 1998, p.305).

### **III - RE-CONSIDERING THE FACTORS INFLUENCING INDIVIDUALS' 'NON USE' OF TECHNOLOGY**

If we consider these accounts as a whole it is clear that most existing explanations of non-use of technology are based upon a number of widely held assumptions. Firstly ICT use is assumed to be an inherently desirable and beneficial activity for all individuals. Consequently throughout all the conventional accounts previously discussed that it is therefore considered 'normal' to use ICT and, conversely, non-use of technology is considered an abnormality. From this 'abnormal' perspective it is a short step towards the shared assumption that non-use of ICT is due to a deficit on the part of the individual concerned. The five discourses of economic/material and cognitive deficiency, technophobia, ideological refusal and diffusion are all fashioned around a deficit model where non-use of technology is due to shortfalls in cognition, personality, knowledge, resourcing, social situation or personal ideology.

Thus, to date, most academics have focused on non-use of ICT as a 'problem' which should be 'solved'. As Bauer (1995) observes, there has been a tendency for commentators to revert to a quasi-pathological model when describing people's non-use of new technologies – presenting the 'problem' through the 'clinical eye' and in a profoundly negative manner. Moreover, this prevailing pathological approach denotes that the problem of non-use of technology has relatively straightforward therapeutic or technical solutions at the level of the individual. Similarly, from both a commercial and political perspective, diffusion theory is appealing in as much as it suggests that universal adoption of a technology will result from increasing public skills and knowledge about technologies and providing those without private means of using ICT with public access. As we shall now go onto explore, viewing non-use of technology in terms of a deficit framework denies the individual any rational choice and free-will. Indeed, as Bruland (1995, p.144) argues, we must consider the possibility that not using certain technologies for some individuals is a more nuanced matter: “ [Non-use] could thus be seen as a positive part of a social selection process, not an obstacle to the inevitable march of technological progress”.

It is at this point that we should recognise the need for a reconceptualisation of students' (non)use of technology if we are to develop a deep, objective understanding of why they may not use ICT in university. First and foremost it is essential to avoid an assumption about the 'benefits' of technology for individuals and, it follows, preclude the formation of a pejorative approach towards non-use of technology. It would also appear prudent to resist mono-causal explanations and focus on individual as well as collective influences. As Rolfe (1990) contests, "research should not attempt mono-causal or simplistic explanations for responses to [technological] change but uncover and assess the relative importance of the many, often conflicting, influences" (p.17). Indeed, what is missing from many existing accounts of (non)use of ICT in higher education is a focus on the individual student and granting to the individual of a degree of agency in their (non)use of ICT.

From this perspective we approach non-use of ICT primarily in terms of understanding the perceived needs of the individual student rather than the perceived needs of their teachers, HEIs, future employers, government or society. This involves accepting that students are more than simply 'end users' with no role to play in the technological process beyond accepting ready-made technological artefacts, but exploring the processes underlying how technologies are consumed and used. Crucially, as Chatman (1996, p.205) observes, any understanding of why an individual is not making use of ICT should start from a bottom-up perspective:

"As a profession, [information/technology academics] are only beginning to serve the needs of other populations. The process of understanding begins with research that *looks* at their social environment and that *defines* information from *their* perspective" (emphasis in original).

As Heller (1987) argues, at best, technology offers a number of 'options', or 'choices based on particular contingencies', which determine the variable impact of technology on people. Thus individuals' interactions with ICT are not as simple as the 'user' / 'non-user' dichotomy constructed by much of the previous literature. It therefore follows that, as Facer and Furlong (2001) reasonably point out, at the heart of the non-user debate is the notion of choice. Whilst some individuals are able to actively choose not to use ICT others have little choice whether they make use of ICT or not. This tension between structure and agency, of course, lies at the heart of most contemporary sociological debates (Giddens 1984) but crucially with respect to our specific area of interest, "human agency is always needed to use technology and this implies the possibility of 'choosing to act otherwise'" (Orlikowski 1992, p.411).

It is therefore possible to adopt an alternative, anti-essentialist view of individuals' non-engagement with ICT. From this perspective, technology has no essential properties. For example, ICT is not inherently beneficial and non-users are not automatically at fault for avoiding use. Instead, as Woolgar (1991) argues, technology can be seen as text; a notion which intimates that the nature and capacity of technology is, in principle, interpretively flexible throughout all stages of development and use (see also Pinch & Bijker 1984). As Steve Woolgar reasons:

“This version of ‘taking social dimensions into account’ offers the opportunity for giving a new focus to analyses of the problem of the user. When construed as a text, technology is to be understood as a manufactured entity, designed and produced within a particular social and organisational context. Significantly, this is often done with particular readers in mind – it is fabricated with the intention that it should be used in particular ways. On the consumption side, the technology is taken up and used in contexts other than, and broadly separate from, its production” (Woolgar 1996, p.92).

Thus applying this metaphor of ‘technology as text’ thereby “sets the frame for an examination of the processes of construction (writing) and use (reading) of the machine, the relation between readers and writers is understood as what it is for and what it can do” (Grint and Woolgar 1997, p.70). From this perspective individuals can ‘read’ ICTs from a variety of perspectives bounded by a number of structural factors. Of course, the reasons underlying individuals' non-use of ICT can often be tacit, clandestine, unconscious or parochial in motive (Bauer 1995). Some underlying factors may be within the capacity of the individual to change and other underlying social and economic forces will fall beyond individual intent (Powell 1987). For some people non-use of ICT is primarily bound up with structural circumstances which prevent them from otherwise making use of ICTs which are relevant and useful to their lives. In other cases, non-use of ICT could be seen as a ‘tactic of resistance’, described by de Certeau (1984) as an ordinary practice that enables disenfranchised and oppressed people to realise their variety of voices, maintain communities, and achieve practical kinds of power. Not using ICT is one way that individuals can assert some control over their lives – in the same way that for some people there is a symbolic value to using ICT (Kingsley and Anderson 1998).

## IV – EXPLORING STUDENTS’ (NON)USE OF ICT IN UNIVERSITY - EMPIRICAL EVIDENCE

From this perspective, the paper now goes onto examine how undergraduate students are ‘reading’ ICT; thereby exploring the varying rationales for either engaging or not with ICT during their time in university. In particular it draws upon a recent study carried out by the author based upon eighteen focus group interviews carried out with business and accounting students in two UK universities. This research project focused on an established business school in a traditional civic university (uni1) and a smaller business department in a ‘new’ university sector institution (uni 2). In total 18 group interviews were held with a total of 77 students who had previously completed questionnaires for the study (see Marriott *et al.* 2003 for complete details of the study). Of the students interviewed, 50.6 percent were male (n=38) with the remaining 49.4 percent female (n=39). Just over two-thirds of the sample were from UK/Eire (n=54) and a third classified as ‘overseas’ students (n=23). All the interviews were recorded (with the consent of the interviewees) on audio cassette and transcribed *verbatim*.

Analysis of these interview data, elicit a variety of influences on students’ engagement with ICT in university. These can be broadly grouped into *short-term factors* (i.e. students’ immediate concerns with coursework assignments, examinations and other forms of degree work and assessment), *medium-term factors* (i.e. course-related concerns culminating in their final degree classification) and *long-term factors* (i.e. the need and usefulness of ICT in relation to future life and employment prospects). These themes are now discussed in greater detail in the following sections.

### (i) Short Term Factors - ‘You’ll Get the Same Marks Manually’

Students first rationalised their use of ICT in terms of the relevance and utility it had to their present situation, which they tended to see in terms of their various modes of assessment. For some ‘fresher’ students the educational usefulness of using a computer had been put into stark contrast by their impending end-of-semester examinations; which in the first year of each university accounted for 50 percent of their overall mark. Students who were less confident with ICT were, understandably, reluctant to jeopardise their examination mark by working throughout the term at a slower pace than they could achieve ‘manually’:

(Group 2, Uni 1, Year 1)

***Q - So you came here, like you say, because of the computers, but you don’t have to necessarily use them?***

Faezal - 'I'll use them but it will take me some time because I don't want my marks to go down just because I want to use computers. I can do that in my house also. I don't want my marks to go down in the exam just because I want to use computers. It's basically the same. You'll get the same marks manually'

However, in one of the first year Financial Accounting modules in the civic university students were introduced to both a manual and a computer spreadsheet approach. In the subsequent examination they were allowed to choose between answering manually or on a paper-based simulation of a computer spreadsheet. This attempt, albeit rudimentary, to integrate the computer into the examination process was not, however, greeted with approval by students. Those interviewees who were due to take this examination were reluctant to risk using a less familiar method; having originally learnt the manual method:

(Group 3, Uni 1, Year 1)

Non - 'One of the exams we've got at the end for financial accounting I think, we're given a print out of a blank spread sheet, as the computer screen would be and we've got to fill it in from the exam paper, I think'

William - 'We're given a choice whether to do it that way or the manual method'

**Q - which way will you choose?**

Sally - 'Manual'

Non - 'We've only done the computer for a couple of weeks'

Ray - 'We did the manual first, and then switching across to spreadsheets now is a bit of a nightmare because you could probably do it quicker manually. Well I know I certainly could at the moment'

Similarly, students in later years who had previously taken this dual-method exam were also dismissive; arguing that a paper-based spreadsheet simulation eradicated any advantage (and therefore purpose) of using a computer:

(Group 8, Uni 1, Year 2)

Warren - 'In the last exam, you can choose what format you want to answer the question in; either a spreadsheet option or on paper'

**Q - did any of you take the spreadsheet option?**

All - 'No'

**Q - why?**

Warren - 'Well it defeats the purpose really. The whole point of spread sheets is that they add up the numbers for you. There's no advantage to be gained from doing it on a piece of paper mocked up like on a spread sheet. You may as well do it in the conventional method, because the only advantage a computer gives is that if you make a mistake you can adjust it and the computer will re-calculate it all for you, and you can move things around to make it perfect'



Akin to these concerns, students in the 'new' university were also concerned that the compulsory computer modules that they were required to take in the first year would result in them gaining lower examination marks than they would have obtained if taught in conventional classes. Although, as this next quote intimates, some students did recognise the long-term benefits of compulsory computer classes, these were out-weighed by the short-term jeopardising of the examination grade:

(Group 13, Uni 2, Year 1)

Raul - 'I reckon that the problem with computer rather than traditional lessons is that ... OK fair enough you learn about computers which may be of value for your job but you may get a lesser grade than you would have. You might get a 2.2 on a computer when you may have got a 2.1 if you had had a proper lesson with a teacher and a blackboard. Computer may be of some value later on in your career, but not starting off'.

Aside from the effect of using a computer on examination performance, a more immediate function of ICT was for the production of coursework; usually essays and reports. In discussing the usefulness of ICT for coursework students were quick to discuss the utility of the Internet; although in mixed terms:

(Group 5, Uni 1, Year 1)

Steve - 'I've done some research stuff on [the Internet], essays, I did some research for one of my essays last term on the Internet and I got some very useful information off it, and I've done that in the past before I was here and it's very useful for research even though you have to search your way through hundreds of pages of absolute crap before you get anything good'

(Group 13, Uni 2, Year 1)

**Q - Do any of you use the Internet for assignments?**

Robin - 'There's loads of shit out there'

Efan - 'A lot of it is absolute rubbish. You have got to go through an hundred and twenty thousand pages'

Paul - 'I'd prefer a good old fashioned library myself. You can go in find the book have a look in the index and go straight to the page you want in a minute. With the Internet, you have to wait for the thing to download, then its the wrong information! Because its so easy you go after some other subject and before you know it three hours have passed and you could have done your project'

Perhaps surprisingly, students' enthusiasm for the Internet as an aid to their assignments was, at best, muted. Some less adept students complained of the difficulty they encountered in finding useful or relevant material. As this

First Year student complained, when used without guidance the Internet was not a guaranteed source of assistance:

(Group 2, Uni 1, Year 1)

Gary - 'The problem is finding out where the information is. I did use it before for assignments and at school and it's always knowing where to look, but at school the teachers always had a vague idea of the best sites to go to. But finding it off your own back you have to be very lucky to find the right sites'

Other students, although more successful in initially searching were, nevertheless wary of the validity of information found on the Internet and, therefore, its relevance to their coursework:

(Group 8, Uni 1, Year 2)

George - 'I was doing an auditing essay and I found very good stuff, very good legal stuff. It was really very good but I wasn't sure if I could use it for my essay because we use another system. So you could get good stuff but is it relevant for your degree?'

Warren - 'I was like that ... I had a marketing essay and we had to find out this thing about life-style changes. And all we could find was American marketing. I mean the American Marketing lifestyles is going to be completely different from the British. So it was just that some bits of [using the Internet] can be completely useless'

John - 'Exactly, its a hard thing to distinguish between is it actually English based information or is it American or something different?'

Similarly, on practical terms alone the Internet was not proving to be the convenient source of information that some students had expected; proving again to be more unwieldy and time-consuming than 'conventional' methods:

(Group 18, Uni 2, Year 3)

Sophie - '[The Internet] doesn't appeal to me at all. We used it a little bit on my work placement last year and I found it so much hassle and it just doesn't appeal to me. I've got access at home but ... no. I'd rather go down the library get a particular book and look it up in the index. That'd take 5 or 10 minutes'

Thus, the vast expansiveness of the Internet, usually seen as its key strength, was proving to be a deterrent to these students whose criteria of completing assignments quickly and accurately were not always being fulfilled. Of course, a fear of learning or achieving less when attempting to acquire new learning skills is common. As Bronwell & Eison (1991, p.53) reason, "[students'] deviation from established methods invites risk, but offers

relatively few rewards". Thus much of the short-term reluctance to rely on ICT would seem to also reflect a conservatism amongst students eager to find information quickly and accurately in an assessment based culture of learning. Throughout the discussions there was an underlying feeling that in the relatively short life of the modular, continuous assessment degree scheme that there was simply no time to develop new skills at the risk of jeopardising work and, ultimately, final examination grades and degree classifications.

### **(ii) Medium Term Factors - 'Its More a Case of Getting a Tick in the Box'**

Aside from students' immediate priorities with examination and coursework performance, a deferred concern with passing the course and achieving a satisfactory degree classification also figured in justifying their present levels of contact with ICT. From an overall perspective, ICT was simply not an essential element of the components that many students' perceived were needed to succeed in their course:

(Group 8, Uni 1, Year 2)

Warren - 'You could probably safely take away every single aspect of IT except from word processing, and it wouldn't make one dent in the actual degree. You can do it just as well conventionally'

Carl - 'You could take away the word processing as well, but people like to spell check you know'

Warren - 'They like us to word-process the essays ... but everything else you could safely take away and it wouldn't effect the student's degree'

Even those students who had specifically chosen computer courses saw ICT as merely a 'hoop to jump through' on the way to being eventually accredited:

(Group 9, Uni 1, Year 2)

Amanda - 'Basically it's a tick in a box because if you go on to do the [professional] qualification you get exempt from the first stage if you've done a fair bit of computing at university. So it's more a case of getting a tick in the box than actually taking something [useful] away'

In part, this perceived lack of importance of ICT through-out the degree courses stemmed from both universities concentrating on ICT at the beginning of the first academic year; presumably hoping to stimulate

autonomous student use during the rest of the course. However, as this student again argued, the first academic year was not seen as an integral part of the course, as it did not actually count towards the final degree mark:

(Group 9, Uni 1, Year 2)

Amanda - 'With the accounting course, the first year you actually do an information systems, accounting information systems course. But doing it in the first year! The first year is, not to be cynical, but people don't necessarily remember much about the first year and to not do anything with IT for the most important two years! I think it's terrible, especially when you're going to go out into your careers. It's going to be, like everything is so computers based now'

Moreover, for some students the lacklustre nature of these first-year introductions to ICT was raised as providing a tacit indication of the (non)importance of ICT to their degree course:

(Group 7, Uni 1, Year 2)

Ismael - '[In the first year] there was a lecture where there was overhead projections of the computer screen but there were also workshops where you actually go to. Even those workshops I don't think they were very good because there was one lecturer, one guy going round and there were 20 students so someone like me, I had no idea, I'd never done this before and could just have a set of instructions, do this, and this, it's not very appropriate. For someone who doesn't use a computer much it can be pretty daunting'

(Group 12, Uni 2, Year 1)

Tracey - 'It can be quite monotonous with the training packages - quite tedious'

Sheryl - 'Yeah just staring at a screen'

Tracey - 'If you're there just reading it for two hours you're like 'Oh God - I've had enough of this' and it just goes over your head then'

These quotations reflect the fact that much current use of ICT in university teaching is un-inspired and anodyne - a trait which Ward (2003, p.12) refers to as 'powerpointlessness'. Similarly, much ICT-based 'learning' "merely mirror[s] simple information giving functions, often falsely associated with lectures" (Clegg *et al.* 2003, p.49). Yet, in making these points students firmly blamed their institutions for the low-tech nature of the courses. Despite their current lack of commitment to using ICT, students were disparaging of the lack of ICT-related elements to their courses:

(Group 7, Uni 1, Year 2)

Ishmael - 'I think they can bring IT more, I think they can bring more IT into it because they have a teaching method which they've probably used for decades now which is a standard lecture, but the world is changing. It's no longer applicable, they have to bring in computers a lot more. There's got to be a lot more hands-on experience on the computer with 2 or 3 people in the room

helping us. It's no good to just have a standard lecture, that has tutorials on it. That's the backward way of thinking now'

### **(iii) Long Term Factors - 'If you can't do the theory you are not capable of doing the job'**

Despite the degree-focused nature of their immediate and medium term concerns, students also took a longer-term perspective of their present engagement with ICT; especially in relation to their eventual graduation into the world of employment. Here, unlike their ambivalence towards ICT in university, the majority of students were adamant of the centrality of computers to their future work as accountants:

(Group 3, Uni 1, Year 1)

Ray - 'Everyone uses it nowadays. If you don't have a clue than you've got no chance. Because everyone uses it and people are finding they aren't getting the jobs'

(Group 7, Uni 1, Year 2)

Ismael - 'The thing about teaching in this school is that it is very much based on what you've done decades ago, standard lecture tutorials. Especially with accounting, it's not valid. I've had experience in a couple of accounting firms and they do absolutely nothing by hand'

Many students in later year groups based their view of employment-based ICT use on experience already gained in accountancy firms; either when on placement during their course or on voluntary work taken before coming to university. For these students, such work experience only reinforced their belief in the centrality of ICT as a basic element working as an accountant; as these quotes from students having just completed their year out in industry illustrate:

(Group 17, Uni 2, Year 3)

Glyn - 'I would say that that was where your work was - all day on a computer'

**Q - Was that a shock?**

Glyn - 'No ... not really. I think that we were already that way minded anyway - it was very computer based. I certainly learnt a lot about computers on my year out. Different uses and how you can manipulate around to the way that you want'

(Group 18, Uni 2, Year 3)

Ade - '[My year out in industry] was positive. It seems that everything in accounting now is all into IT and computers. Management accounting is all Excel

spreadsheets. Anything you do most of the time is using a computer. Whatever you do is using a computers - you're not doing your t-accounts with credit and debit. Everything is now on computers'

However, whereas students recognised the integral role of the computer in accounting as a profession they still did not necessarily see using ICT whilst in university as a priority. When probed, students seemed confident that above and beyond a basic competency with computers, employers would expect to train graduates 'on the job' rather than expect fully developed skills on entry. Thus, as these students discuss, a basic level of computer awareness is more a taken-for-granted competency than an valuable positioning skill when competing for employment:

(Group 10, Uni 1, Year 3)

Julian - 'Its going to be more useful if you can use a computer, so then [your employer] doesn't have to spend several hundred pounds training you in work

Matthew - 'But in the workplace they can probably sit you down for a week at the most and you'll know it. And you'll carry on using it every day for the rest of your working life. So you'll be used to it!'

Bob - 'I think it's more an additional thing rather than a core thing - computer literacy really'

Tina - 'I suppose [employers] assume that everyone else is doing the same as well and that *nobody* else has that knowledge'

Matthew - '[Employers] are probably used to employing graduates anyway and are probably know what standards their IT literacies are not'

Julian - 'Its not what it should be but its the fact that everyone's at the same level. So [employers] accept that and look for excellent individuals rather than people who are good at one thing'

Indeed, this argument was extended in some interview groups to questioning of employers' real powers of discrimination when asking for 'good IT skills':

(Group 17, Uni 2, Year 3)

Euros - 'I kind of think that we're still at the stage that when [employers] say 'Good IT skills' they're still not too sure what they mean by 'Good IT skills'. And when you get there they do give you training on what they want you to do anyway and its pretty easy to pick up a basic knowledge of IT. They are looking for the personal things like confidence and just being able to do what they want'

As these last quotations intimate, many students saw ICT skills as a basic element of being a good accountant *but* not as an essential element. Thus,

when justifying their (non)use of ICT in university, students were quick to highlight the non-ICT based qualities which they felt employers prioritised instead. Primarily, students stressed the need for a deeper 'understanding' of accountancy above and beyond mechanically using a computer to calculate accounts:

(Group 3, Uni 1, Year 1)

Amy - '[In the future] the computer is just going to be able to do it all for you, you know, there's bound to be packages which can more or less do everything. But I think you have to understand what you are doing which is I think is the foundation of what we are trying to learn. And to be able to then solve problems that are going to arise, Just because you know how to work the computer package, doesn't mean that you are going to be able to solve complex problems, in accounting terms'

(Group 14, Uni 2, Year 2)

Feeza - 'You need to know how to use a computer and you need to be able to figure out how to get around with it. But if you don't have the package skill then obviously the employer can show you, as each package is different. Like we are doing Sage here. Back home where I worked Sage is not what we used, it was completely different. But knowing what accountancy is, knowing what a double entry is, knowing what transaction to put where ... You *need* to know what accounts skills are. You could pick up IT skills later on'

Thus students placed most importance on the 'thinking' side of accountancy as opposed merely to the 'doing' side; something which they saw the computer as involved in:

(Group 11, Uni 1, Year 3)

Beth - 'If you can't do the theory you are not capable of doing the job, whether you can use a computer or not. If you have a certain level of knowledge, a certain level of intelligence, then you can use the computer, you can be taught how to use a computer if you can be taught how to do business finance, then you can be taught how to use a computer'

(Group 4, Uni 1, Year 1)

Ismini - 'You do some things manually first and you think about things before you enter them into the computer. So there is the thinking part of accounting and then there is the computerised system. You still need the thinking part'

Finally, aside from the 'thinking' and understanding skills, students also stressed the need for a range of other essential skills in the workplace which they felt they were developing whilst at university; such as adaptability, 'broadmindedness' and confidence:

(Group 17, Uni 2, Year 3)

**Q - So what makes a good Accountant?**

Glyn - 'Well prepared and open minded to the world of accounting. I mean it varies in so many ways - they don't want sort of a tunnel vision student who says that they want to do this, this and this and they don't like this, this and this. They want more broadmindedness'

Euros - 'Being prepared to go into more than one course of study. They don't want you to just do one certain thing. They may say that 'We need you to do this or we need you to do this'. Its just being prepared to go on with you study and looking into what they want you to study. And confidence as well'

Alun - 'I mean different companies do things completely differently so you've got to be able to adapt to different methods'

Thus even from a longer term perspective ICT was still seen by many of the students as subordinate to a host of other skills and competencies.

## V - DISCUSSION

These data have concentrated, primarily, on business students' expressed rationales for maintaining only low levels of engagement with ICT. In doing so, it could not (and should not) be asserted that *all* students in higher education are failing to use computers regularly and effectively. Nevertheless, from this sample of business and accounting students – themselves some of the seemingly more 'IT-compatible' subject areas in the university curriculum - the predominant picture from both the interview and preceding survey data (see Marriott *et al.* 2003 for a discussion of this) was one of ambivalent and irregular engagement with ICT above and beyond the word-processing of assignments. Thus, in exploring students' 'reading' of ICT at university the paper has revealed three distinct phases of reasoning.

From a *short term* perspective, the 'consequential validity' of assessment appears paramount on students' reading of ICT (Linn *et al.* 1991, Boud 1995, Gibbs 1999); i.e. "the effect of the test or other form of assessment on learning and other educational matters" (Boud 1995, p.38). For these students at least, the non-integral role that computers took in the assessment demands of their courses, aside from the word-processing of essays, was a clear impetus *not* to make extensive use of ICT. As Knight (1995) argues, students can often view assessment as a 'moral' activity by teaching staff; making it abundantly clear what is valued in the course and by higher education in general. Indeed, for some students, the marginalisation of ICT was starkly illustrated by the optional use of paper-based print-outs of computer displays in one of their exams; a process seen as far more



unwieldy and time-consuming than opting for the manual method of accounting. Thus, it would seem that assessment plays an extremely significant role in determining students' immediate (non)use of ICT; acting "as a mechanism to control students that is far more pervasive and insidious than most staff would be prepared to acknowledge" (Boud 1995, p.38).

Similarly, students' *medium-term* perspectives on successfully completing the degree and attaining a 'respectable' grade were equally as 'ICT-free'. The comment made by one student that ICT could be safely 'taken out' of the degree and make no difference was particularly telling. In this way, as with assessment, many students' present antipathy towards ICT can be seen as purely 'strategic' in the face of the growing external pressures to achieve at least satisfactory degree classifications (Macfarlane 1998). Such behaviour is certainly not a new phenomenon. Three decades ago, Snyder (1971) demonstrated how college students quickly orientated themselves towards the 'hidden' rather than the formal curriculum and tailored their activities to what was tacitly expected of them. Given the purely incidental and conflicting role that ICT appeared to be playing in their degree courses students had little medium-term incentive to continue to use computers.

However, no such preconceptions were held regarding students' *long-term* perspective of establishing careers in the business and accounting sectors. Here students were unanimous in voicing the necessity to have a degree of competence with ICT in order to gain employment with firms but, nonetheless, were sanguine in where ICT lay in relation to other desirable skills and competencies. Thus ICT was seen as being a basic, but not ultimately essential, element of developing students' 'marketability' to employers (Cryer 1998). Students were, therefore, confident in the levels of ICT skill expected by employers and in their abilities to fulfil these expectations as and when required. This indifferent view of the ultimate value of ICT as a employment skill in fact mirrors a growing body of research into graduate employer demand for skills which portrays a graduate labour market where over-arching personal skills and qualities are valued far more highly by employers than any specific ICT ability (i.e. Harvey 1993, Hockey & Wellington 1994, Osmond 1994, Hesketh 1998).

Although higher education institutions are facing the 'information technology challenge' from all directions (Alstyne 1997) the issue of students' use of ICT remains, perhaps, the most exacting. As Arnold (1999, p.49) concedes, establishing routine use of information and communications technology in university teaching and learning requires significant and 'non-trivial' changes to both pedagogic and academic work practices; "promoting such change is problematic for change advocates and engaging in such change is problematic for participants". In part, the findings in this study are

a reflection of the ever-present tension between the scholastic demands of higher education and the vocational demands of government (Robins & Webster 1999). Yet to merely berate higher education institutions for not reflecting adequately the perceived vocational imperative of ICT in their curricula is to overlook the equally ambivalent attitudes that students displayed towards employer demand for ICT.

Of course if ICT use is to become more widespread in HE then more efforts need to be directed towards increasing students' basic levels of ICT skills and knowledge – as well as those of their tutors and teachers. It is widely acknowledged that issues such as resourcing, accessibility, 'faculty resistance' and the role-modelling and gatekeeping functions of academic staff all have an impact on students' use of ICT in university settings (Rowley *et al.* 2003, Larson *et al.* 2002, Molyneux 2003) and, instead, some of the comments from students in our interview sample certainly pointed towards the issue of staff familiarity and confidence with the Internet. Yet, whilst some of the quotations from our interviews directly reflect a lack of knowledge and skills on the part of students their (non)use of ICT goes beyond issues of material and skills deficits. More accurately using and not using ICT is a complex, fluid and ambiguous issue guided by 'goodness-of-fit' with their academic and non-academic lives.

From this perspective the onus should not lie with concentrating on attempting to change university students. Rather than representing the views of misconceived, 'techno-phobic' or short-sighted students, the data presented in this paper instead point towards a highly rational, empowered and pragmatic student body facing up to both the short and long-term requirements posited by their degree and future employment prospects. In not choosing to presently engage with ICT on a regular or sustained basis, these students appeared to be prioritising clearly the use of ICT against a host of other considerations and then acting accordingly. The fact that sustained use of ICT was neither advantageous or required for the bulk of their degree studies left many students in little doubt over its place; at best a short-term criterion to fulfil and 'box to tick' in the first year before commencing with the 'real' part of the degree.

Similarly, despite most students' conviction of the salience of ICT in their future employment, their decisions to place ICT behind a host of other 'desirable' skills, as well as their conviction that they could gain any required future ICT skills 'on-the-job', also demonstrated a very considered and rational 'rejection' of university-based ICT. Indeed, such sentiments can be argued to reflect a key element of information-based employment in the new century; what Castells (1997) refers to as 'self-programmability'. This refers to the capacity to learn and re-learn, train and re-train throughout the

lifespan and in direct relation to the short-term demands of the labour market. As Robins and Webster (1999, p.202) describe, “the requisite for the adaptability and opportunism demanded in the dauntingly flexible world of informational capitalism”. It would seem that for many students *not* using ICT is simply a pragmatic response to the short-term demands of the degree and then gaining employment, rather than a deep-rooted technological inability or long-term ignorance.

Thus in trying to address the issue of low-levels of student engagement with ICT in university we must address the pervading theme of an ambivalence about using ICT in university. Ambivalence refers to the experience of simultaneous positive and negative affect towards an object. Whereas psychologists see ambivalence arising from intrapersonal conflict, here we can turn instead to the broader sociological notion of ambivalence arising at the level of social structure when an individual in a particular social relation experiences contradictory demands or norms that cannot be simultaneously expressed in behaviour (Weingardt 2000). Smelser (1998) makes the convincing case that whilst the idea of ambivalence is usually used by academics to explain phenomena such as reactions to death, separation and relationships, it is also required in our understanding of more prosaic socially structured issues. Thus with regards to ICT we can identify students’ profoundly ambivalent attitudes as reflecting various structural attributes of the ‘information society’ - in particular where they are surrounded by ‘macro’ discourses and portrayals of inherently beneficial, empowering and ‘magical’ new technologies from governments, media, peers whilst at the same time experiencing a fairly limited utility and usefulness of the same technologies on a ‘micro’ every-day life perspective – especially in the university setting.

On one hand, we found plentiful evidence in our interviews that “the personal computer has become a symbol of efficiency and participation in the information age” (Lupton and Noble 2002, p.10). Yet, on the other hand, though, we found that students’ are less likely to be involved in the high level use of ICT in a university context, less likely to be involved in the culture of ICT and, most importantly, less likely to be involved in the *pleasures* of using ICT (see Faulkner 2001). From this perspective, if something is both less useful and less pleasurable in practice then people are understandably less inclined to engage with it. Of course, “the effect of the felt ambivalence about technology is often either immobilising or polarising” (Faulkner 2001, p.90). Whilst very few of our interviewees were polarised into an almost ideological opposition to computers, the majority were immobilised via an inability to fit computers usefully into their university lives and, therefore, made little or no use of them.

Students' current ambivalence with ICT in university contrasted with their positive views of ICT in the workplace also highlight the point that people can move between not using ICT and using ICT throughout their lifetime – and also that use and non-use of ICT will vary from technology to technology. One could be a regular user of a mobile phone yet never use the internet or a personal-computer for example. More pertinently, a student could be a regular user of computers at home for leisure purposes or in a work placement yet never use computers in university. Murdock (2002) points towards the notion of a technological 'career' – emphasising the changing nature of people's relationships with and use of technology. As Kingsley and Anderson (1998, p.303) also reason, this change can work in both directions, with users deciding to cease using ICT as well as non-users being 'converted' into users.

Thus in answer to the question why is higher education teaching and learning not being effected by ICT, one response should be that ICT is being effected by higher education teaching and learning: “the social relations of education are thus both determined and determining of how ICTs come to be used in the classroom” (Clegg *et al.* 2003, p.46). From this basis concentrating on the structure and social relations of universities would seem a sensible basis from which to proceed; an approach which leaves at least three options open to consideration.

#### *Option 1) the whole-sale restructuring of HE around ICT*

It is possible to argue for the whole-sale restructuring of undergraduate education to ensure that students make regular use of ICT. As Ó Fathaigh (2002) argues ICT and e-learning may only become established via “radical alterations to the way we structure and organise our systems /institutions/processes of lifelong learning”. For example, one of the key limiting factors from our interview data was the lack of relevance of ICT to the students' assessment. As Leggett and Robertson (1996) argue, the culture of assessment often transcends all other educational objectives; “education is a serious business, a discipline with a well defined goal: the *grade*” (p.67). Intrinsically linking the 'grade' to students' use of ICT via the use of computer-mediated assessment would therefore clearly leave students little option but to use ICT if they are to achieve a desirable degree classification (Miller *et al.* 1998). Similar strategies may include the provision of certain integral course resources solely via ICT. Yet solely relying on such strategies of compulsion can be strongly argued to be of limited long-term effect. It is now widely acknowledged that new technologies tend to supplement rather than substitute for existing practice and forms of organisation (Woolgar 2000). Thus, as Whitson (1998) argues, the

integration of any 'key skill' such as ICT into university teaching and learning requires fundamental reform to curricular *processes* rather than curricular outcomes. Instead, it has been argued that we should aim for a situation where "any use of e-learning would therefore involve a negotiation in which the decision not to use technology was as valid as the decision to use it" (Clegg *et al.* 2003, p.51).

*Option 2) realistically embedding ICT within existing practices in HE*

With this in mind it could be persuasively argued that educators would be better suited to look towards realistically embedding ICT within existing practices in HE. As Åkerlind and Trevitt (1999) demonstrate, student resistance to education technology occurs most when it involves a marked change in the way that they interact intellectually with material as opposed to merely making established methods easier. It could be, that rather than as a 'bolt-on' key skill, that the primary role of ICT in higher education should be to supplement and complement existing curricular processes; thus "support[ing] the learning [and] creating access to richly structured instantiated knowledge, and to facilitate and mediate a learner's interaction with it" (Macfarlane 1998, p.81). Thus, concentrating on facilitating genuinely useful engagement with ICT, such as structured and supported use of the Internet, within the processes of a degree would appear to fulfil this objective without introducing an element of coercion and compulsion which may prove equally as demotivating. Others have argued for a need to treat IT as an intellectual subject and focus attention on improving students' information skills, understanding and 'information fluency' as well as procedural skills (see Reffell and Whitworth 2002). These options are less easy to achieve in practice.

*Option 3) accepting the status quo*

Third, would be to realistically accept the current situation of low-level and inconsistent use of ICT. Students' use of ICT has been accurately characterised by a host of studies as 'piecemeal', 'difficult to manage' and cater for – with the underlying implication that students are not 'good' and 'effective' users of ICT (Rowley 2003). It may be that this is accepted as the case and political, pedagogic and academic expectations altered accordingly. After all, students are ineffective users and consumers of many teaching and learning resources at university (e.g. libraries, lectures, staff) and there is little reason why ICT should be any different. This ties in with the recognised but less often voiced fact that many students are (partially) disengaged from higher education as a whole – or as Williams (2001) puts content to 'drift

through' university with minimum effort. From this perspective ICT is unlikely to re-engage them with something they are already less than enamoured with. Many of the issues ICT is supposed to address within university education (attendance, time, cost, motivation) are social problems with deep-rooted social precedents which require long-term social solutions.

## **CONCLUSION**

It is likely a combination of all three of these options could be adopted to some effect over the next two or three years. There are formal elements of higher education teaching and learning where ICT could be more extensively integrated to force an element of student use. Embedding ICT use more usefully into the every-day practice of students and teaching staff is also achievable. Moreover, there is certainly a need to more realistically accept the realities of the present situation and acknowledge that ICT use looks likely to remain disparate across different student groups. Yet, rather than end on a defeatist note, this discussion has hopefully highlighted the need to approach ICT from a social as well as a technical perspective. To achieve any lasting change and a transparent use of ICT in undergraduate and graduate curricula, it is clear that we must look *beyond* the areas of educational computing most often seized upon by previous literature (such as lack of teacher expertise and poor quality resourcing). 'Deficiency' factors such as a lack of time, expertise, knowledge and training are important, but partial, explanations as to why some individuals adapt better than others to new practices and innovations. Fundamentally, as Corbett *et al.* (1987) argue, "educational change depends on what [people] do and think - it is as simple and as complex as that" (p.39).

## Footnote

This working paper is based on a keynote paper given to the 'Finding Common Ground: IT Education, Dearing and Democracy in the Information Society' Conference - University of Leeds Department of Computing - July 9<sup>th</sup> 2003

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