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E-LEARNING AND THE DIGITAL DIVIDE: PERPETUATING CULTURAL AND SOCIO-ECONOMIC ELITISM IN HIGHER EDUCATION

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Abstract

Education is seen as a route to full participation in society, and widening participation in education and lifelong learning as a way of including those who are currently excluded from many of the benefits of society. The use of learning technology is perceived as a means of widening participation in higher education by enabling participation by non-traditional students. E-learning is perceived as lowering barriers of time and space to enable non-traditional students to attend campus-based education while accessing resources at a time and place of their choosing. This research finds a digital divide with some students financially unable to afford technology and broadband access, others without the skills to engage with learning technology, and some culturally less able to benefit from technological enrichment. It also finds gender and generational differences disenfranchising some students.

Keywords: digital divide, learning technology, widening participation

1 INTRODUCTION

Widening participation in education is seen by many as a means of including those who have hitherto been excluded from many of the benefits of modern society. Education for all is viewed as an imperative for world security, as an unconnected population suffering high unemployment leads to instability. Education, skills, ethics and values lead to responsible citizens, an educated and competent people are the essential foundation for democratic societies and market economies, (Daniel, 1999).

One of the most obvious barriers to learning is cost (Godard, Selwyn, & Williams, 2000), but there are others such as time, location of educational institutions, and cultural access to education. There is an untested perception that many of these barriers can be overcome by the use of learning technology that reduces time and place barriers allowing learners increasing access to learning materials and activities via virtual learning environments (VLEs) that they can access on campus networks in university computer facilities, in halls of residence via 'resnets', and at home via the Internet.

According to Lewin, Mavers and Somekh (2003) technology plays a unique role as the unifying 'big idea' that policy-makers believe will deliver raised educational performance and at the same time open up opportunities for all in a more just and inclusive education system. The UK Government believes lifelong learning will bring economic benefit and increase social inclusion (Godard et al., 2000), and the European Lifelong Learning Initiative (ELLI) espouses lifelong learning as a means to achieve human potential (Longworth, 1999). While distance learning represents one aspect of widening participation, the use of learning technologies in traditional face to face (F2F) teaching and learning is also important. While some universities use e-learning for distance education, most students in higher education attend traditional campus based universities and participate in F2F learning which is increasingly being delivered in conjunction with online resources and activities over VLEs.

In light of the importance of widening participation and lifelong learning, and the role that technology plays in including previously excluded populations, it is important that universities engage with learning technologies in such a way as to ensure access is available for non-traditional students from those sections of society that have been previously excluded. This research therefore asks three questions:

Where traditional universities use learning technologies, are they being used with the intention of widening participation beyond those members of society who would traditionally attend university?

Are learning technologies being used in a manner that makes education accessible to such potential non-traditional students?

Are efforts being made to make learning technology available to non-traditional students?

This paper follows with a review of education and learning technology literature, a research design and methodology section, the findings from this research and the analysis and conclusions reached.

2 LITERATURE REVIEW

Many members of society who do not participate in higher education are seen to be non-participants because of lack of financial resources, caring or work-related commitments that leave insufficient time to attend a traditional campus-based course of study, or for cultural reasons that leave the individual unwilling, or unmotivated to attend university. Traditionally non-participating groups in tertiary education are the young unemployed, and adult returners. Poorer groups defined by unemployment, low wage, occupational class, gender, area of residence, have low participation in learning, as do ex-offenders, part-time or temporary workers, those with low levels of basic skills, and some ethnic groups (Godard et al., 2000).

It is therefore a central tenet of widening participation in adult learning, and combating social exclusion, that the time and place barriers of access to learning should be lowered, and the belief that information and communications technology (ICT) will facilitate that (Godard et al., 2000). ICT can minimise time and place constraints in adult education provided learners have access to, and the skills to use, modern technology (ETAG, 1998), and there is a belief that learning technologies should be used to deliver learning for people wherever they want to receive it (Longworth, 1999).

However, not all households in the western democracies of Europe or North America have access to the technologies required to participate in learning. The digital divide refers to the gap between those who have access to the new information technologies, the information 'haves', and those who do not have access, the information 'have-nots' (Clark, 2003). In Europe there is North South digital divide, with Sweden at the top of the ranking having the most access to technologies, and Greece at the bottom, Belgium, the Netherlands, and Britain are above the mean, France and Germany are in the middle, while Spain, Italy, and Portugal are lagging behind (Brady, 2004). What is more, simple access to a computer in the home is no longer sufficient, in order to fully participate in higher education where learning technologies deliver resources via VLEs, access to the Internet is necessary, and because of increasing file size and the interactive nature of such technologically supported teaching and learning, bandwidth is critical to student time and cost. Thus the newest dimension of the digital divide is access to broadband Internet service (Prieger, 2003). Digital equity in education must mean that every student needs equal access to technology and the opportunity to be full participants in the digital age (Solomon, Allen, & Resta, 2003).

In a recent study of the use of learning technology in secondary education, a significant minority of students' homes were found to lack computers and internet links (Lewin et al., 2003). Other studies show significantly worse situations, only one-third of households in Wales have access to computers at home, while only thirteen percent have access to the Internet at home (Godard et al., 2000). Access to, and use of, the Internet at home is divided along socio-economic lines and while 52% of the UK population are regular Internet users, the growth of use in low income groups is low. Of those regularly using the Internet, 82% are high earners, while only 10% are low earners (Anonymous, 2003). Access to the Internet is limited by a number of factors besides hardware and access to telecommunications service, for example many websites are not designed to be used with adaptive technologies such as audio screen readers and Braille keyboards leaving the visually impaired excluded from full participation (Anonymous, 2003).

While there may be many in society using the ICT and the Internet, an important minority do not use it. 17 million adults in the UK have not accessed the Internet in the last 12 months (Anonymous, 2003). There are many barriers to the adoption of ICT in the home, a US study by Venkatesh (2001) cites three reasons for non-adoption: rapid change in technology 58%, high cost 38%, and requisite knowledge 40%. The study shows that adopters were driven by the utilitarian outcomes, hedonic outcomes (i.e., fun), and social outcomes (i.e., status) from adoption. Non-adopters on the other hand were influenced primarily by rapid changes in technology and the consequent fear of obsolescence. Those not intending to adopt followed their intent more closely than those who did intend to adopt.

Cultural and gender differences are also important. Amongst Hispanic college students in the USA there are statistically significant differences between males and females in their attitudes towards the use of the internet and technology, with males generally more accepting in the use of technology than females (Slate, Manuel, & Brinson, 2002). Attitudes to the use of technology affects the choice of educational course. Females exhibit more anxiety in the use of technology and do not incorporate technology courses in their educational programs as much as males (Slate et al., 2002). The use of technology by the adult returner female population is also problematic. Some authors view the amelioration of time and place boundaries from the use of ICT as a compromise for women who might otherwise have to choose between full-time activities such as education or working, and raising children (Duxbury, Higgins, & Neufled, 1998; Foegen, 1984).

The culture of ICT is generally young, white, middle class and male, not working class, older, female or ethnic minority (Godard et al., 2000), which leads to a view that in the short to medium term access to the Internet will be delineated along the lines of socio-economic, gender, and ethnic group, and traditional patterns of exclusion will remain. There is a lack of skills and access to hardware which is stopping low income groups from accessing the Internet (Anonymous, 2003), and the cost of equipment and access to the internet is unlikely to attract poorer groups. What is more, as access patterns, and the technology required for access changes, those who are already excluded will be playing catch-up (Godard et al., 2000).

Educational technology is not a neutral and value free tool (Lewin et al., 2003), Technology use is culturally located and certain kinds of use create cultural capital, translating into economic capital through career development and other opportunities, while others do not (Bourdieu, 1977). Thus, the advantages from the use of educational technology is restricted to those who's homes have high cultural capital (Lewin et al., 2003). From an institutional perspective, the digital world is emergent, evolving, embedded, fragmented, and a provisional social production, shaped by cultural and structural forces as well as technical and economic ones (Orlikowski & Barley, 2001). Household choices, socio-economic status and family structure affect educational opportunities (Lewin et al., 2003). According to Barley and Tolbert (1997) "Organisations and the individuals who populate them are suspended in a web of values, norms, rules, beliefs, and taken-for-granted assumptions, that are at least partially of their own making". Educational success may require parental support for participation, and a belief that education is important (Lewin et al., 2003) and many students who do not have access to the internet outside of school never use it inside school (Somekh & Mavers, 2001).

Although many students have no access to the Internet at home, university campuses and community libraries do have computing facilities. However, while ICT facilities are provided free at point of delivery, in institutions such as libraries and university computing sites, the problems of opening times, transport and other barriers remain (Godard et al., 2000).

There are other issues to consider in the use of learning technologies. The use of technology in education may be inappropriate for conventional pedagogical approaches of information transfer and high stakes assessment (Lewin et al., 2003), and the social context of education is more important than the technology or the curriculum (Henning & Westhuizen, 2004). So even if ICT is used to reduce time and place barriers, students accessing resources from home, and limiting their presence on campus, will miss out on the benefits associated with face to face learning, and the learning in meaningful contexts espoused by Bruner (1960).

Is technology really an answer to educational exclusion and the social exclusion it engenders? Many believe it has its drawbacks. Inequalities of access to technology may exaggerate traditional barriers to learning, thus the use of learning technology is likely to replicate inequalities in access to education (Godard et al., 2000), a view supported by Bourdieu (1977) who believes that technology may replicate and intensify existing discourses and practices. Thus technology is likely to increase disadvantage rather than reduce it because of inequality of access (Selwyn, 1997) and the role of technology in widening participation may be less than advocates claim (Godard et al., 2000). Lewin (2003) states that the UK government's approach to broadening access to education through the use of technology is highly problematic and since use is socio-culturally constructed it leads to reproduction of inequalities between students who's homes have differing levels of cultural capital. Thus for some researchers the role of technology in effectively widening participation in adult learning remains largely untested (Godard et al., 2000).

3 RESEARCH PROPOSITION

If widening participation in education to previously excluded members of society is a critical mission for the European Union, and ICT is to play a pivotal role in that mission, are universities using learning technology in such a way as to support that programme? In order to do so universities must

consider three elements to VLE use: first, is the intention in the use of learning technology to widen participation to those members of society who have previously been excluded from participation in higher education? Second, is learning technology used in a pedagogical manner that is accessible to non-traditional students? Third, are institutions making an effort to ensure that disadvantaged students are provided with the technology required to access online learning resources and activities, and VLEs?

4 RESEARCH DESIGN AND METHOD

A multiple in-depth case study approach has been adopted, which is consistent with the focus of obtaining rich data in a natural setting (Yin, 1994). Data was gathered from multiple sources from within each case to provide mutual verification (Glaser & Strauss, 1967). The contemporary nature of this research, and the availability of the key actors in each case, as well as documentation, meant that case study was a practical option.

E-learning in universities is being adopted by many similar organisations across a relatively homogeneous industry. Performance measurement is standardised in the UK by virtue of governmental funding policy, and published rankings of universities, used by students in choosing an HEI. While there may be some discussion, or dissent, about the appropriateness of such measures for funding decisions, or choice of university, research universities nevertheless strive to compete on the basis of research assessment exercise (RAE) ratings, and a limited number of published rankings for postgraduate courses. This provided an opportunity to identify case organisations operating at different levels of performance. Seven UK higher educational institutions were chosen for study (Table 1), two in the upper quartile of the national rankings, one mid, and two lower quartile cases, along with a distance only institution, and an institute of higher education which did not have full university status. This offered a wide range of institutional type and performance level. Each case was a research and teaching institution with both undergraduate, and taught and research postgraduate, courses. All cases use learning technologies, all have, to a greater or lesser extent, programmes of study delivered at a distance. Although one is purely a distance learning institution, the remainder are traditional campus-based universities or university colleges.

Case	Size	Research	E-learning	Distance / Local
1.	Large	Active	Active	Distance not a focus / local use of learning technology through use of VLE
2.	Small	Active	Active	Distance not a focus / local use of learning technology through use of VLE
3.	Large	Active	Active	Mainstream distance courses plus local use of learning technology through use of VLE
4.	Large	Less active	Active	Delivers courses at a distance via partner organisations plus local use of learning technology through use of VLE
5.	Large	Active	Active	Solely distance learning
6.	Large	Less active	Active	Distance not a focus / local use of learning technology through use of VLE
7.	Small	Active	Active	Distance not a focus / local use of learning technology through use of VLE

Table 1 Selection of cases

Principal actors in each case were identified and interviewed. Research by Walsh and Linton (2001) and Marino (1996) was used to build an interview framework in the form of a questionnaire, but interviews were semi-structured, allowing freedom for discussion to develop. Interviewees in all of the cases were users of learning technologies, or actors in a decision-making position within the organisation who were in a position to influence the organisation's use of learning technology. All

interviewees discussed the use of learning technology in terms of what they perceived to be the most important elements of its use, and the implications of use. Documentation was gathered where available. Interviews were tape recorded, and the tapes transcribed. Transcriptions were then coded and entered into Envivo, a qualitative analysis tool, to aid analysis.

5 FINDINGS AND ANALYSIS

The research data is in the form of interview transcripts and notes, along with documents where available. Interviewee statements were sorted into themes that arose from the data. In some instances subjects made clear statements that were used to identify areas of importance, other themes emerged from the data where subjects identified issues, processes and capabilities. Themes were supported by more than one subject, and where possible all were corroborated against several interviewees. An example is when interviewees were asked if there was a digital divide among their students, many subjects stated that they believed there was a problem, and not all of their students had computers at home. This was taken as evidence that not all students had equal access to learning technologies. This was then triangulated against statements that identified that learning programmes were at least partially delivered using technologies such as VLEs, which suggests that there is inequality in educational access.

Although most respondents in all of the cases addressed the digital divide either directly or indirectly, nine different respondents particularly identified the digital divide as a problem, in fifteen different passages of data. Samples of these data are provided below (Table 2):

Case 1 subject 2	A lot of our students either arrive with computers or laptops and we have very good network access for halls of residence. We also have nomadic networking within the university and most students have mobile phones and that is another technology, we have been experimenting with PDAs
Case 2 subject 11	[Is the digital divide a problem for your students?] from the point of view of these particular projects, absolutely! And we are thinking about the distance learning component, for those students who are off on placement ... the things that always gives us a great deal of actually, not just a little worry, but a great deal of worry, is we do not want to disadvantage those individuals who are off at companies that don't have access to, to either high-speed internet, or whatever, we don't want to disadvantage those few against others who may be in large companies
Case 2 subject 11	most other students were on-campus, had access to high-speed internet, so we could stream video, we could have these rich experiences, we could have wide board with audio
Case 2 subject 6	we need to look at the infrastructure that supports e-learning, and around the university we can't for example just start saying to students you're not going to have lectures anymore you're going to use computers, you know what about students who come to university and can't afford a computer?
Case 3 subject 14	What comes up during the course is that occasionally someone finds something which is a really good resource. If that ends up being a huge pdf file, or a piece of software someone says: this is really great; you should try it. Next year maybe we will supply that, but for the moment, people either have broadband or they spend their 25 minutes.
Case 3 subject 14	As the course developed I think people have altered their own internet service provider; people actually started this course still paying a penny a minute and they changed pretty quickly .. and then there are people who are saying: I think I'll go to broadband. I think once people get into it and they see that they are going to be on-line a lot – this is one of the disadvantages of our VLE, you can't do very much off-line.

Case 3 subject 14	all we asked for this course is that people have – we asked too little this year, we will ask them more – we asked that they had a certain basic experience which was – this year we just said if you have done some web-surfing. Next year we are going to say that you need to have a certain familiarity with using the web and email, which would come from having a web-link at work or at home, because we have found that people didn't understand what a threaded discussion was, that kind of stuff. That is just a little bit too little experience. We just asked that they had a sufficiently good computer that they – next year we will say: your computer must be new enough to be running Windows XP. Another thing we ask them is that they have to have a CD writer or something like that. I think you have to do that I think there is no way you could run an on-line course, nobody could do this unless they specified something (laughs) because it would just be too huge.
Case 5 subject 19	For some people, e-learning means on-line learning, for us it doesn't, for us it would extend to CD-ROM delivery and we have decided that for most of our students, broadband is a long way off and since the way we teach requires quite a lot of rich media – audio and video features heavily in our courses, because we take a kind of case based approach - we have decided that most of our courses are going to need to use CD-ROMs. It is going to be a mixture of CD-ROMs, on-line resource materials of various kinds and communications systems, conferencing.
Case 5 subject 19	There is a strategy in the sense that, in the case of both of our big professional programmes, the social work programme and the nursing programme, we have developed electronic media strategies. Now part of the strategy is dealing with the employers, making sure they are aware of the expectations on them because there is an expectation that they will provide access to computing equipment and the internet for the students but also access for some of the others players, practice teachers and mentors.
Case 5 subject 19	We were very aware 2 or 3 years ago that our students in health and social care didn't have very good access to equipment
Case 5 subject 19	There is some resistance. We have tried to handle this over a 2-3 year period so it is not seen as a sudden step. The resistance is largely, it is stated as being a concern about access, student access and the tradition of [Case 5] being open access. It is seen as being a major shift by a number of academics and one they don't really relish. There is a feeling that there are bound to be 5% or so of our current students, who would not make that change. I am not convinced about that; I think with enough warning and enough preparation, students will go with us, but there is concern about that from some academics.
Case 6 subject 25	there is [a problem with a digital divide] if you, there would be if you focussed solely on them accessing it from home the technology tower provides [them] pretty good technology access [is that twenty four hour?] er, no
Case 6 subject 27	[In] my 2001 research that I looked at that either 46 or 54 percent had access to a computer at home
Case 6 subject 28	there is probably some sort of currency to the notion, but I don't think it applies here particularly because we do provide quite good access to computers, and so .. obviously there will be some students who couldn't afford to have an on-line, and ISP sort of broadband prices, and might, and might not even be able to afford to have a computer, I mean, it's debatable really I suppose, um, but I think there's something there yeah, generally speaking, but I don't think that's a big factor in my work, I think [with] the sort of students I work with [teaching computer science]
Case 6 subject 29	I don't think that such a big issue is used to be, I think the numbers [that have computers at home] are very high, I teach computing so my figures are always very high. 80 or 90 per cent of students have a computer at home, so that's, they're computing students, but as I say our emphasis is on attendance based learning, face-to-face learning and we do try to encourage them to attend.

Table 2 Sample of data

These data are only a sample, but are indicative of the kind of issues that arose in the case organisations. It is worth noting that none of the cases had a strategy for supplying equipment for students other than that provided as a function of learning support for those with learning difficulties, and none of the cases provided online access to students at home, although all but one provided online access on campus.

All of the cases in this study use learning technologies to support face to face and or distance teaching and learning. Most of the respondents in all of the cases addressed the issue of a digital divide either directly or indirectly. The issues that were raised were: student access to computers and the Internet on campus and at home; bandwidth associated issues such as file size, streaming audio or video, interactivity; cost of access to computers and broadband; difficulty addressing widening participation.

None of the case organisations had clear or enacted strategies to deal with the digital divide. Few of the respondents discussed cultural, ethnic or gender differences with the acceptance or use of ICT. None of the learning programmes took steps to ameliorate access difficulties such as ensuring all file sizes are small, ensuring that all students have basic ICT skills training prior to the start of a course, or the provision of computers and Internet access at home for those in traditionally excluded sectors of society.

All of the cases had some strategy documents or policies which referred to widening participation, but it must be added that few of the cases had enacted e-learning strategies, and most of the use of learning technology could be viewed as emergent (Sims, Powell, & Vidgen, 2004). Some of the cases had a strong mission of inclusivity, but nevertheless had no enacted strategy for technology access for students at home.

In answering the first of the questions posed by this research the data is unclear as to whether the intention is to use learning technology to widen participation to those members of society who have previously been excluded from participation in higher education. Since the use of learning technology is often acquired and funded centrally, and this research did not have access to the original decision process regarding technology acquisition, it is unable to draw a conclusion about intent. However, those using the technology do so largely for pedagogical reasons, none for reasons of widening participation. Where widening participation is a consideration it results in a reduced motivation to use learning technologies, not in an increased motivation, thus the use of learning technology is perceived by academics as a barrier to widening participation rather than a means of lowering barriers.

The second question asks: is learning technology used in a pedagogical manner that that is accessible to non-traditional students? The data collected from this study suggests that decisions about online pedagogy are not based on widening participation, but rather on enriching teaching and learning for those students who do have access to technology.

The answer to the third question is negative, institutions are not making an effort to ensure that disadvantaged students are provided with the technology required to access online learning resources and activities on VLEs. Although some students do have access to technology if they are assessed as having learning difficulties, those students who have financial, cultural, or other disadvantages are not provided with computers and internet access at home.

6 CONCLUSION

With the advent of learning technologies and the use of VLEs, online access to learning is an important issue for campus based universities engaging in F2F teaching and learning. Not only is access to a computer and the Internet on campus an issue, but many students are expected to have access to computers and the Internet at home, or in the work place when on placement, in order to access VLEs. But the digital divide has moved beyond mere access to computers and the Internet, because of large file sizes and the use of interactive e-learning, access to broadband is also of growing importance.

Although national governments and the EU place a high importance on widening participation in education, and universities, the traditional seat of higher education, are key players in implementing widening participation, none of the universities studied by this research had programmes for bridging the digital divide. None provided hardware or online access for student use in homes. None took steps to ensure that file-size and interactivity was compatible with non-broadband transmission. None of the

cases considered cultural, ethnic or gender issues in the use of learning technology. Five of the seven cases believed the digital divide to be a particular problem.

Some of the respondents believed that access to computing facilities on campus was a sufficient measure to overcome lack of access at home. However, the lowering of time and place barriers is an important aspect of including non-traditional students in higher education, and if students have to travel to campus in order to use computing facilities the place barrier is not lowered, and if facilities are not open 42-7 then the time barriers are not lowered either.

This study must conclude that without particular measures to overcome the digital divide, current practices in higher education reinforce socio-economic, cultural, ethnic and gender divides in access to higher education.

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