Monograph "Redefining the Digital Divide in Higher Education"

ARTICLE

Degrees of Digital Division: Reconsidering Digital Inequalities and Contemporary Higher Education

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Abstract

Whilst many authors are now confident to dismiss the notion of the digital divide, this paper argues that inequalities in ICT use in contemporary higher education are of growing rather than diminishing importance. In particular, it argues that there is an urgent need for the higher education community to develop more sophisticated understandings of the nature of the digital divisions that exist within current cohorts of university students – not least inequalities of 'effective' use of ICT to access information and knowledge. With these thoughts in mind, the paper presents a review of recent research and theoretical work in the area of digital exclusion and the digital divide, and considers a number of reasons why digital exclusion remains a complex and entrenched social problem within populations of higher education students.

Keywords

digital inequality, ICT use, higher education, digital divide

Grados de la división digital: Reconsideración de las desigualdades digitales y educación superior contemporánea

Resumen

Aunque muchos autores ya rechazan con seguridad la noción de brecha digital, este documento razona que las desigualdades en el uso de las TIC en la educación superior contemporánea tienen una importancia creciente en lugar de decreciente. Concretamente, razona que existe una necesidad urgente de que la comunidad de la educación superior desarrolle conocimientos más sofisticados de la naturaleza de las brechas digitales existentes en los grupos actuales de estudiantes universitarios, particularmente desigualdades del uso «efectivo» de las TIC para acceder a la información y el conocimiento. Con estos pensamientos en mente, el documento presenta una visión global de los estudios recientes y teorías en el ámbito de la exclusión digital y la brecha digital, y tiene en cuenta una serie de motivos del por qué la exclusión digital sigue siendo un problema social complejo y profundamente arraigado en los grupos de estudiantes de educación superior.

Palabras clave

desigualdad digital, uso de las TIC, educación superior, brecha digital

Introduction

It is now widely accepted that information and communications technologies (ICTs) lie at the heart of education in the twenty-first century. In particular, much faith continues to be placed in technologies such as the internet as catalysts for the substantial 'digital remediation' of educational processes and practices. For instance, through ICTs learners are argued to enjoy increased levels of access to a diversity of learning opportunities, as well as greater freedom to choose the educational options that best fit their needs. Technology is also seen to offer a 'personalisation' of the time, place and pace of learning. In short, ICTs are seen to be supporting the reconfiguration of education and learning along more engaging and efficient lines – an 'education 2.0' as some researchers are now putting it.

Whilst these changes are seen to apply to all forms of education, they are felt to be especially applicable to higher education (HE). According to many researchers, higher education is now characterised by an increased fairness of choice facilitated by ICT use. Thus contemporary HE, is now seen to involve "an increasingly pick-and-mix approach from students, who are likely to slip between full- and part- time study, take different courses at different institutions, and learn in different ways – be it online, face-to-face or virtual world – depending on mood and preference" (Swain 2009, p.1). All told, digital technologies are felt to support forms of university teaching and learning that are more efficient, engaging and equitable.

Digital technology has certainly had a profound bearing on the appearance of contemporary higher education provision. Most universities are now rich in technology resources and technology-based activities. Ever-increasing levels of funding continue to be directed towards the on-campus application of ICTs. Expenditure on universities' ICT infrastructures has risen dramatically over the last decade as institutions attempt to blend new technologies into most aspects of face-to-face teaching and learning, as well as into students' independent study. Lately the burgeoning use of virtual learning environments has seen the concept of the university campus moving away from a 'bricks and mortar' to a 'clicks and mortar' model. As Higginbottom (2009, p.1) argues, ICTs are now "fundamentally altering the way" that universities operate.

There are many reasons why HE has been party to more technological change than other sectors of education provision. At a practical level, universities are far more autonomous than schools, tertiary colleges or adult education providers, and therefore able to invest in technological systems with greater ease. Like many areas of education

provision, universities have had to respond to a profound demographic shift in their customer-base, now catering for incoming cohorts of 'digital natives' who were born during the 1980s and 1990s and subsequently 'grew up bathed in bits' (see Tapscott and Williams 2007, Prensky 2008). Yet unlike most other areas of education provision, much of the non-teaching 'business' of higher education is also entwined with technology use – from the integral role of the university sector as a driver of the knowledge economy to university involvement in technology R&D. As Higginbottom (2009, p.1) concludes, the pace of ICT use in HE is being driven "by forces such as globalization, demographics, technology, increasingly demanding student expectations and a new world in which high levels of knowledge and technology amongst workers are required for an increasingly competitive economy".

In this sense most researchers see the main problem posed by ICT for universities as one of being able to keep up with the pace of technological change.

Ultimatums continue to be made that universities must either "transform or die" in the face of technological progress (Bates 2004). As Swain (2009, p.1) recently wrote with regard to current generations of 'cyber students', new ICTs are "transforming higher education, and students are driving the changes. Can [university] institutions keep up?". As all these excerpts suggest, growing numbers of educational commentators are viewing the use of ICT in HE in defiantly transformatory terms. Much of this enthusiasm is based around presumptions of an enhanced equality of opportunity, with much popular and academic comment celebrating (at least implicitly) the capacity of ICTs to recast social arrangements and relations along open and democratic lines. This is currently evident, for instance, in ongoing enthusiasm for the educational potential of so-called 'web 2.0' technologies such as wikis, social networking and blogging. In this sense, many of the concerns about inequalities in the use of ICTs that may have been prevalent during education technology debates in the 1990s have all but subsided.

Indeed, the notion of the digital divide in HE is now notable only by its absence in contemporary education debate, with most commentators content to dismiss the digital divide as "a last century anxiety" (Brown 2005, p.13). By 2010, we were assured, "only the homeless and the jobless will be webless" (Sutherland 2004, p.7). As relatively well-educated, middle class and young individuals, university students are seen as highly unlikely to fall into the categories of low- or non-users of ICT. If anything, the only digital dilemma within twenty-first century higher education is seen to be that of university students having *too much* access to ICTs.

This concern is evident, for example, within the growing consternation amongst some university educators about the academic and scholarly de-powering of a 'Google generation' of undergraduates who are seen to be overly digitally dependent (e.g. Fearn 2008). Especially prominent here has been Tara Brabazon's depiction of the current 'net generation' of undergraduate students - bemoaning a situation where 'clicking replaces thinking' and students' scholarship consists of little more than 'Googling their way' through degree courses and engaging in forms of "accelerated smash and grab scholarship" (Brabazon 2007, p.39).

As might be expected from its title, the remainder of this paper presents a rather different perspective on ICT use in contemporary higher education. As we enter the 2010s this paper argues that, if anything, the digital divide is gaining, rather than losing, significance in contemporary higher education. Moreover, there is an urgent need for the higher education community to develop more sophisticated understandings of the nature of the digital divisions that exist within their current cohorts of students. Against this background the paper now goes on to present a review of recent research and theoretical work in the area of digital exclusion and the digital divide, and considers a number of reasons why digital exclusion remains a complex and entrenched social problem within populations of higher education students.

Recognising multiple levels of ICT use in higher education

It is first necessary to establish what is meant by 'ICT use' – a distinction often glossed over by those commenting on the digital divide. In this respect, ICT use encompasses a number of integral elements of successfully participating in twenty-first century higher education. At a basic level, what a student knows, who they interact with, and what they are able to do is contingent upon being connected adequately to the information flows of contemporary society. For example, computer-mediated communication and mobile telecommunications technologies are at the heart of many social interactions, however mundane or life-changing. Similarly, the worldwide web is now established as a key setting where students access and interact with information. Outside of education and learning, ICTs now play an integral role in students' employment, their involvement in civic or political affairs as well as consumption by consumer groups and entertainment services. In all these instances, ICT use is increasingly implicated in what

it means to be socially, economically, culturally and politically involved in twenty-first century society and twenty-first century higher education

Yet in recognising the importance of 'ICT use', we must be clear of its multiple components. As our discussion so far has implied, any talk of 'ICT access and use' in contemporary society refers to much more than access to a desktop or laptop computer, having basic keyboard skills and a familiarity with common software applications. Firstly, the digital activities and interactions outlined above can take place via a range of different types of ICT. The convergence of new media platforms such as digital television, mobile telephony, games technologies and other portable devices has led to a multi-modality of technology access and use – ably illustrated in the recent development of Apple's *i-phone* device. As such there is a wider number of portable and personalised ICT devices with which one may, for example, use the internet. However, it is important to recognise that the technical and social qualities of such use can vary considerably across different platforms – for example, the difference between searching the worldwide web on a mobile telephone and on a desktop PC. Secondly, alongside this variety of ICT hardware we also need to acknowledge the importance of the differing range of connectivity into information and telecommunications networks. Whilst the connectivity debate which raged within Europe and North America during the late 1990s and early 2000s centred around the necessity of 'broadband' rather than 'narrowband' access to the internet, other spectrums of connectively now exist, most notably wi-fi and other forms of wireless connections, all with varying speeds and quality of data transmission, and all suitable for different types of users.

Crucially, being able to use these ICT configurations is reliant on a variety of competencies and literacies above and beyond basic technological literacy of being able to operate common ICT tools effectively. This much broader view of 'multi-literacies' sees individuals requiring the language, number and technical skills which give them access to the evolving digital world, alongside a set of creative and critical skills and understanding to productively engage with technology use in their lives (New London Group 1996). As Andy Carvin (2000) has outlined, these competencies include the ability to be 'information literate' (the ability to discern the quality of content), 'adaptively literate' (the ability to develop new skills whilst using ICTs) and 'occupationally literate' (the ability to apply these skills in business, education or domestic environments). These competencies are underpinned by levels of basic literacy in reading and writing and the functional

literacy of being able to put these skills to daily use. Crucially, then, the various forms of 'digital literacies' required of the individual learner mirror but also go beyond the traditional twentieth century literacies of 'lettered representation' (Lankshear *et al.* 2000). As Thoman and Jolls (2005, p.4) conclude:

> "No longer is it enough to be able to read the printed word; children, youth, and adults, too, need the ability to both critically interpret the powerful images of a multimedia culture and express themselves in multiple media forms".

These points and caveats withstanding, we should finally consider the fundamental yet often unvoiced element of the digital divide debate - the outcome, impact and consequences of accessing and using ICT. Indeed, much contemporary debate on inequalities and ICT concentrates only on the means rather than the ends of engagement of ICT use. As Wise (1997, p.143) acknowledges:

> "the problem with questions of access is that they reify whatever it is that we are to have access to as something central to our lives without which we would be destitute. They, therefore, redirect debate away from the technologies or services themselves".

To be of any lasting significance any conceptualisation of the digital divide in HE must combine questions of access and use of technology with the impact and consequences of engagement with information and communications technology for individual students. In this way, we are challenging the prevailing assumption within much discussion of technology and education that ICT is inherently beneficial and 'a good thing' for all individuals. Instead it should be acknowledged that the consequences of using and engaging with ICTs are not automatic for all. As Balnaves and Caputi (1997, p.92) reason, it follows that where the impact, meaning and consequences of ICT use are limited for individuals then we cannot expect sustained levels of engagement:

> "The concept of the information age, predicated upon technology and the media, deals with the transformation of society. However, without improvements in quality of life there would seem to be little point in adopting online multimedia services".

In particular, this notion of meaning can be seen as being at the heart of the digital divide debate within the context of higher education. For example, a host of au-

thors have pointed towards understanding the *situational relevance* of access to technology and information from the point of view of the individual student, and, in particular, the relevance of the consequences or potential consequences of engagement with ICT (see Balnaves & Caputi, 1997). In this sense, the consequences of meaningfully engaging with ICT could be seen in terms of the effect on the various dimensions of a student's participation in higher education. They may include: *production activity* (engaging in an academically valued activity, such as education/training); *political activity* (engaging in some collective effort to improve or protect the social and physical environment of the university) and *social activity* (engaging in significant social interaction with teaching staff and fellow learners, or identifying with academic groups, communities and cultures). Thus the impact of ICTs could be seen in those terms which reflect the extent to which technology use enables learners to participate and be part of the university settings in which they are studying, i.e. the extent to which "ICTs enhance our abilities to fulfil active roles in society, or being without them constitute[s] a barrier to that end" (Haddon 2000, p.389).

Recognising multiple levels of digital division in higher education

With all these factors in mind we can now begin to reconstruct the concept of digital divides within the context of higher education in more sophisticated terms; as a hierarchy of access to various forms of technology in various contexts, resulting in differing levels of engagement and consequences. On the one hand, we are still concerned with inequalities in students' opportunities to access and use different forms of ICT. On the other hand we are also concerned with different inequalities of outcome resulting either directly or indirectly from students' engagement with these technologies. Thus it makes little sense to talk of a single dichotomous division as these inequalities of opportunity and outcome run along multiple lines. The different elements that need to be taken into consideration and factors that make up the digital divide are shown in Table 1. Here the progression from formal/theoretical access to effective/perceived access is followed by basic use of ICT that then may, or may not, lead to meaningful engagement with ICTs, information and services. This process culminates in the potential short-term outcomes and longer-term consequences of this engagement with ICTs.

TABLE 1. Stages in the digital divide

Formal/ theoretical access to ICTs and content	Formal provision of ICTs in home, community and university settings that is available to the individual in theory.
Effective access to ICTs and content	Provision of ICTs in home, community and university settings that the individual feels able to access.
Use of ICTs	Contact with ICTs in any form. May or may not be 'meaningful' use. May or may not lead to medium/long term consequences.
Engagement with ICTs and content	'Meaningful' use of ICTs. Where the user exercises a degree of control and choice over technology and content. Use could be considered to be useful, fruitful, and significant and has relevance to the individual.
Outcomes - actual and perceived	Immediate/short term consequences of ICT use.
Consequences - actual and perceived	Medium/long term consequences of ICT use in terms of participating in society. Could be seen in terms of: production activity; political activity; social activity; consumption activity.

Source: own material

If we see students' ICT use in these terms then the digital divide is obviously more than simple issues of ability to access technological resources and availability of content. In this sense there is a need to move beyond a conventional understanding of the digital divide as a simple case of technology 'haves' and 'have nots' and begin to address the area of digital inclusion in more nuanced terms.

Firstly, it is important to note that making use of digital technologies does not, in itself, constitute a student's digital inclusion. As Mark Warschauer (2003, p.46) has argued, "the key issue is not unequal access to computers but rather the unequal ways that computers are used". From this perspective, a number of authors have begun to map out multi-dimensional definitions of digital exclusion that encompass the multiple levels of ICT use outlined above. For instance, Lievrouw and Farb (2003) propose four basic elements of digital equity above and beyond matters of physical access to resources – namely skills, content, values and context. Similarly, Yu (2006) discusses ICT use in terms of skills, literacies, support and outcomes of activity and practice (such as the differences in outcomes between ICT-based entertainment as opposed to education). Also of use is Jan van Dijk's (2005, p.21) delineation between the motivations behind making use of ICTs, possession of operational, information and strategic ICT skills, and the nature of usage (e.g. usage time, the number and diversity of applications). Crucially, van Dijk sees the success of these stages of engagement with ICTs as contingent on the following aspects of resourcing:

• Temporal resources (time to spend on different activities in life);
• Material resources above and beyond ICT equipment and services (e.g. income and all kinds of property);
• Mental resources (knowledge, general social and technical skills above and beyond specific ICT skills);
• Social resources (social network positions and relationships – e.g. in the university setting, home or community);
• Cultural resources (cultural assets, such as status and forms of credentials).

With these components in mind, growing attention is being paid to inequalities in terms of the quality of students' ICT use. The type of ICT tools that an individual uses, the ways in which they are used, and the outcomes that accrue as a result all appear to coalesce into what can be described as these second order digital divisions (Hargittai 2002). In particular these can be seen to include the difference between the use of ICT for the passive acquisition of information and knowledge, as opposed to the use of ICT for the active and communal creation and sharing of information and knowledge – the so-called consumption/production divide. Indeed, Kennedy's recent study of ICT amongst Australian undergraduate students made the careful distinction between what was termed 'advanced technology use' (i.e. social bookmarking, contributing to wikis, and publishing and uploading podcasts) and what they termed 'standard web' use (i.e. information retrieval, downloading of content) (Kennedy *et al*. 2008).

It is also important to note the socially shaped nature of an individual's engagement with ICTs, and acknowledge that students' perceptions and understandings of the affordances of ICT use are likely to be organisationally and socially based. If the wider cultural context of use (such as the university setting) does not fit well with the culture of the ICT application, then use will not easily follow. As such, ICT use is not just based on the individual student being able

to understand the potential benefits of ICT use, but on how well ICT-based activity fits with the wider contexts within which they are operating. In this sense an integral aspect of ICT (non-)use is that of individual agency and choice. Above and beyond having the necessary access to resources, digital inclusion is therefore predicated on the ability to make an informed choice when *and when not* to make use of ICTs. So digital inclusion is not simply a matter of ensuring that all individuals make use of ICTs in their day-to-day lives, but a matter of ensuring that all individuals are able to make what could be referred to as 'smart' use of ICTs, i.e. using ICTs as and when appropriate. In this sense not making use of ICTs can be a positive outcome for some people in some situations, providing that the individual is exercising an empowered 'digital choice' not to do so (see Dutton 2005).

Evidence of the continued inequalities of ICT access and use in higher education

It is worthwhile taking some time to consider the patterning of digital exclusion within HE in more detail. In doing so there is a wealth of empirical evidence on which we can draw. For instance, a host of large-scale and well-executed studies have sought to map the digital inequalities throughout the general populations of developed and developing countries alike (Dutton and Helsper 2007, Notten *et al.* 2009, Broos and Roe 2010). Whilst there is some variation in the magnitude of difference, the social groups most likely to be characterised as being 'digitally excluded' in these data are most commonly delineated in terms of gender, age, income, race, educational background, geography and disability (see also Yu 2006). Such has been the recurring importance of variables such as age, socio-economic status, education, family composition, gender and geography, that the Pew '*Internet and American Life*' study was to observe that "demography is destiny when it comes to predicting who will go online" (Pew 2003, p.41). This conclusion has been reinforced year by year by a variety of digital divide surveys and statistical analyses produced by governments, the IT industry, charitable foundations and market researchers the world over.

Rather than be found to be distinct from the rest of society, there is considerable evidence that these divisions are apparent and often amplified within populations of university students. From a quantitative perspective, for example, recent surveys of university students confirm significant variations and divisions with students' ostensibly high lev-

els of cohort ICT use (e.g. Kennedy *et al.* 2008, Oliver & Goerke, 2007, Salaway & Caruso 2008, Selwyn 2008). In particular these studies tend to show that whilst there are high levels of use of particular types of technology among the majority of students (not least social networking, chatting, downloading and information retrieval), other activities are pursued at far lower and inequitable levels.

In particular, recent empirical studies of web 2.0 use by learners in formal and informal settings suggest a lack of what could be considered 'authentic' or even 'useful' participative learning activity amongst young people. Ongoing Norwegian research by Brandtzæg (2008), for example, has identified nearly three-quarters of students as what can be termed 'non-active users' of web 2.0 tools, with recent UK and Australian studies also highlighting a general lack of 'sophisticated' or 'advanced' use of web 2.0 services and applications (Kennedy et al. 2008, Chan and McLoughlin 2008, Nicholas *et al.* 2008). These variations in the type and frequency of use have been found to vary especially in terms of students' gender, race, socio-economic background, age and educational background (see Cotton and Jelenewicz 2006). As Kennedy concludes, university students' (non-)use of ICTs shows there is "substantial diversity in usage patterns that is not explained by age" alone (Kennedy *et al.* 2008, p.489).

The complex nature of these inequalities of use is perhaps best illustrated in Caruso and Salaway's (2008) recent survey of over 27,000 students at 98 US colleges and universities. Whilst the authors found that almost all students engaged in using college and library websites and slideshow presentation software, conversely only some students engaged in more sophisticated ICT uses such as blogging, social bookmarking, virtual worlds, multiplayer online games, contributing to wikis and photo/video sharing websites – and then on an infrequent basis (i.e. monthly or less). These uses were found to be delineated by age, gender, whether students resided on or off campus, area of student (e.g. business or engineering as opposed to fine arts or humanities subjects), and the type of institution attended. As the authors concluded:

> "Net Generation students, along with older students, report that they are not looking for extensive use of IT when it comes to their academic courses. They do not take lots of entirely online courses, and most indicate that even when course lecture materials are posted online, they still attend classes. Instead there is a widespread attitude that IT resources are best situated in learning environments where technology is balanced with other learning activities, especially face-to-face interactions with faculty and students in the classroom" (Caruso and Salaway 2008, pp.10-11).

The subtlety and complexity of these digital inequalities is also revealed by a number of qualitative studies of university students' ICT use. For instance, in terms of the type of internet applications used by individuals, recent studies have suggested that preferences for particular applications over others follow sophisticated class-based patterns of taste and distinction. In terms of social networking services, for example, Hargittai (2007) reports that preferences for applications such as *MySpace* as opposed to *Facebook* appear to be patterned along lines of social class and educational background. Similarly, in terms of the nature of internet activity, the likelihood of a user engaging in the creation of online content has been found to be patterned by socioeconomic status (Hargittai and Walejko 2008).

Other qualitative studies have highlighted the contextual shaping of students' ICT use – not least the influence of the 'lived' experiences of individual students, i.e. understanding ICT use as part of the act of being a student in social, economic, political as well as educational terms. Here, research suggests that many students act as 'savvy' but pressured consumers of higher education, often engaging with their studies in ruthlessly pragmatic, strategic and tactical ways. In terms of surviving or even thriving during their university education many students are compelled instead to adopt 'low-level' surface and/or strategic approaches to studying with the aim of achieving high grades with little incentive to make sustained uses of ICTs. As their degrees progress, it is argued that students fast become 'portfolio people', with ICT often seen as being a basic, but not ultimately essential, element of developing their 'marketability' to employers (Selwyn *et al.*, 2000).

Other studies have also shown how students working in subject disciplines and universities with rigid pedagogical and epistemological cultures will often rarely have a contextual need to use ICT. Even within degree courses using ostensibly 'high-tech' provision of learning, the practical significance of digital technology can be limited. For instance, Kate Orton-Johnson's auto-ethnography of web-based distance-learning showed that online communicative and communal activities are often, in effect, only secondary activities which contribute little to the 'real' practices of university study which remain "grounded in traditional offline activities; reading, note taking and the production of assessed work" (Orton-Johnson 2007, para 11.2). In this sense university students' use or non-use of ICT for their studies may not always be due to a disadvantage *per se* but "more due to matters of 'digital choice' rather than 'digital divide'" (Brotcorne 2005).

Conclusions

It should be clear from even this brief discussion that 'ICT use' in higher education is a multi-faceted concept which encompasses a variety of activities and practices, via a range of hardware platforms and means of connectivity, requiring a number of different competencies and resulting in a number of outcomes. It follows that digital divisions can – and will – persist along all of these lines. As many of the empirical studies highlighted in the latter part of this paper suggest, ICT use continues to be a source of subtle but significant social inequality amongst university students in enduring ways. As such, higher education authorities that wish to ensure the fair and equitable use of ICT use within and between cohorts of university students must reach well beyond issues of technological resourcing and availability of content to address the persistence of a number of digital divides, information divides and knowledge divides.

In this sense there is a clear need for the education debate to begin to address the area of digital inclusion in more nuanced terms. We hope that the issues and arguments raised in this paper – and throughout this journal – can act as the catalyst for a sustained period of debate, discussion and development concerning digital exclusion and the establishment of more equitable higher education provision. Whilst it is trite to talk of 'digital divide 2.0' within higher education, in many ways this paper is arguing for a wholesale re-imagining of digital exclusion as a social issue, and a wholesale rethinking of the responses required by higher education providers. Although digital exclusion may well have started as a twentieth century problem, it looks set to remain a key issue in HE for many decades to come.

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Recommended citation

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