Transforming teaching in a digital world: From determinism to democracy?

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Abstract: In the past few years we have witnessed significant changes in Higher Education (HE) in a drive to transform education through technology. Technology Enhanced Learning (TEL) has become a taken-for-granted assumption in HE which masks existing divides and the diversity of learning experiences. This paper considers education in the digital world and challenges some of the educational discourses to argue that we need to adopt a more democratic approach to understanding the relationship between technology and teaching in HE. As educational ideologies have changed from the more traditional notions based on a hierarchical transfer of knowledge to more democratic, inclusive and participatory approaches, we need to develop better understanding of the complex inter-relationships within the socio-technical networks. Drawing on Actor Network Theory (ANT) this paper calls for a more democratic lens with which to view the relationship between technology and education in a digital world and proposes that we should adopt a more ecological approach.

Keywords: Actor-network theory; technology enhanced learning; higher education

In late modern society, the restructuring of education to create a highly skilled and knowledgeable workforce has been at the centre of educational reform (France, 2007). Central to such educational reforms has been the role of ICTs (Information and Communication Technologies) and the internet in improving both access to education and in improving educational outcomes. Post-PC tablets, for example, have been heralded as essential for 21st Century Learning (Clark and Luckin, 2013, p. 2) and 'in education, the talk is of a fundamental transformation – a revolution – in young people's cultural experiences' (Buckingham, 2007, p. 75). More recently the push to use technology transform to teaching and students' experiences of learning have dominated educational reforms in the HE sector across the globe. The determination in Europe to make access to education more inclusive, flexible and open is underpinned by a drive to improve education through increasing the use of ICT to better align educational experiences with the current digital everyday world. The European Commission (*online*) argue that 'ICT tools, Open Educational Resources, and open practices allow for an increase in the effectiveness of education, allowing for more personalized learning, a better

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learning experience, and an improved use of resources. Such measures also promote equity by increasing the availability of knowledge.' The benefits of technology are taken for granted in education (Selwyn, 2011) and currently much emphasis is placed on Technology Enhanced Learning (TEL) opportunities in driving the revolution and transforming educational practices and educational outcomes. Yet these changes are not without some challenges as Beaudoin, (2015, p. 34) argues:

> 'In the digital age, higher education, willingly or unwillingly, is experiencing relatively dramatic changes, which are inherently disruptive, especially because change presents unfamiliar alternatives to the long-established status quo. In this new climate of flux, educational entities can be proactive and lead change, or be reactive and possibly be vulnerable to unwanted change. But institutions that resist innovative opportunities do so at their own peril, as their peers transform themselves to meet new demands. This trend of disruptive and continuous change creates unfamiliar challenges, as once-stable organizations are constantly being reshaped for and by the digital age and its transient nature.

This paper examines some of the dominant discourses on the digital world and education and discusses how technology is viewed as transforming education in late modernity. It challenges some of the taken-for-granted assumptions which lie within both policy and educational rhetoric to argue that we need to take a different approach to understanding the complex hybridity in the use of technology in Higher Education (HE) environments. Rather than accepting the deterministic discourses which mask the diversity and divides which remain, I propose a more democratic lens through which to understand the ecology of the learning environment. I adopt aspects of actor network theory (ANT) to examine the assumption that that by investing significantly in educational technologies the problems facing the higher education sector will diminish. However, more technology will not always equal better outcomes. The highly complex and sophisticated nature of such technologies cannot be understood as tools that help us overcome problems, but as environments (Uzelac, 2008). Thus my undertaking here is to address the role of technology in higher education by exploring some the complex inter-relationships in the socio-technical networks in which higher education is itself embedded, to illustrate that what looks good in principle, might not play out the same way in practice. In reality, rather than replacing traditional teaching methods, the technologies of education are experienced by many higher education teachers as simply adding to their workloads and not all students have the same level of digital literacy. Furthermore, if technological innovation is to succeed and thus enable us to reach the desired outcomes, certain preconditions need to be achieved which are unlikely given that digital divides remain and this diversity is often ignored. It important to remember

that what at we think of as technologies do not exist outside of the actor networks in which they are embedded and of which they are a part. If this is so we need to give consideration to some of the translations within these actor networks which contribute to or challenge the learning environment. It is some of these challenges that I wish to explore here and discuss how we may potentially begin to understand some of the taken for granted assumptions in relation to digital worlds and education. However, as I have argued elsewhere (Bond & Goodchild, 2012, 2013), the relationship between technology and teaching in HE is far from straightforward.

The transformational shift towards open access to the information society in the knowledge economy differs significantly from traditional educational theories based on a more objective view of knowledge which assumes that 'knowledge can be imparted from teacher to learner through instruction, lecture and practice' (Gulati, 2004, p. 1).

> The lesson for higher education is that it cannot thrive by relying on its hegemony and legacy as the exclusive purveyor of information and ideas, delivered via traditional formats and means. With few exceptions, every college and university must strategically plot its future position along the continuum between face-to-face and distance instruction, augmented by appropriate support systems, changes which will often require substantive modifications to infrastructure. (Beaudoin, 2015, p. 34)

Whilst, 'media culture has come to dominate everyday life, serving as the ubiquitous background and often highly seductive foreground of our attention and activity' (Kellner, 1995: p. 3) and debates on the interrelationship between technologies, the internet, and access to information dominate education discourses around the globe, the drive to use technology to transform education and access to information is not that new. 'The single most influential explanation of the relationship between technology and society' is technological determinism which views changes in technology as the most important cause of social change (Wajcman, 1994, p. 3). As such many discourses on technology as a transformational tool in education are overly deterministic, and fail to account for the complex relationship between technology and society and the political and economic environment within which they interact. Furthermore, as Silverstone (1999: p. 10) argues 'technology and society do not coincide. History undermines ontology.' 'Technologies do simply appear on the scene, fully developed and ready to be implemented' (Croteau & Hoyes, 2003, p. 314) and Willmore (2002) suggests that many of the challenges and debates currently centred on the use of internet related technologies are similar to those of other innovations in ICT dating back to the printing press in the 15th century as technology weakens the ability of governments to control access to information, literature and knowledge. The

tension between self-realisation and control, however, has always been a feature of modernity (Giddens, 1990, 1991). The notion of social transformation resulting from change in the system of production is also not a new one and, although it was central to Marx's argument that technological developments are fundamental in capitalism and associated aspects of social life, others 'have been more sceptical about the social and progressive qualities attributed to science and technology' (Smart, 1992, p. 30). Uzelac (2008) argues that these highly complex and sophisticated technologies cannot simply be understood as tools that have helped us overcome certain problems but should be understood as environments.

Most university environments have, indeed undergone remarkable transformations in the last few years (Wesch, 2009) but the changes are wider than simply that of an increasingly use of ICT. There has simultaneously been conceptual shift from the dominant educational frameworks derived from Bloom *et al.* (1956) which were based on hierarchical, linear domains of knowledge towards more inclusive, student centred and participatory approaches influenced by and increasing dominance of social constructivist perspectives in educational theory and policy directives. Furthermore, this paradigm shift has also changed the way we want students to learn in that, as access to information opens up through the digital economy, our expectations of students have also changed in that it has become less important for them to memorise and simply recall facts and information and more important for them to be able to access, critically analyse and actually create information themselves (Wesch, 2009). These changes reflect, arguably a positive shift in perspective in HE teaching towards a more participatory philosophy and the adoption of more student-centred learning strategies which foster a deep approach to student learning (Ramsden, 1992) and which also have had an impact on how their learning is assessed (Bond & Clark, 2013). However, as Light and Cox (2001, p. 29) also point out students are 'presented with languages and practices which are unfamiliar and their encounter with higher education and their learning is not simply cognitive or intellectual grappling with new ideas, concepts and frameworks but also a personal and emotional engagement with the situation'. Thus a highly complex interrelated network of both humans (subjects) and technologies (objects) and the importance of the social aspects of learning should not be overlooked. As this social world cannot be divided into things on the one hand and the social on the other (Bingham, 1996) it is essential to understand the 'intricate and mutually constitutive character of the human and the technical (Prout, 1996, p. 198). Thus in the language of ANT, (namely Latour, 1993) learning becomes an entity in that it is viewed as a hybrid of quasi-subjects and quasi-objects constantly changing and being renegotiated within the network.

Whilst academic discourses may reflect changes in educational ideologies from a hierarchical transfer of knowledge to more democratic, inclusive and participatory approaches, I argue here that we should be remain

mindful of being overly swayed by deterministic debates which fail to acknowledge the complex inter-relationships in the socio-technical networks. The 'framing of people and technology within these deterministic discourses tends to hide the key shaping actors, the values and the power relations behind the increasing use of ICT in society' (Selwyn, 2003, p. 368). In HE a self-congratulatory rhetoric about paradigm shifts has emerged as the voyage into a better future for student outcomes and the learning experience but what this deterministic discourse misses is in fact a far more messy reality that using an ANT lens makes visible. If determinism does not adequately account for the social embeddedness of technology, we need to understand the concept of the socio-technical network and how technologies 'do not exist apart from institutions, exerting and external impact, but are part and parcel of them' (Warschauer, 2003: p. 208). Furthermore, drawing on Weber and classical social theory, Radovanović *et al.* (2015, p. 1734) point out that 'learning technologies are filtered through existing systems of stratification, and thus, such technologies must contend with existing institutional logics that maintain such stratification'. As Livingstone (2009, pp. 206-207) observes here:

> In future research and policy, a satisfactory analysis of media or internet literacy will require- similar to that long argued for theories of print literacy – recognition of the historically and culturally conditioned relationship among three processes, no one of which is sufficient alone (i) the symbolic and material (textual, technological) representation of knowledge, cultural and values – especially as they are now being rewritten for a convergent, multimodal, globalising digital age; (ii) the distribution of socially situated practices across a stratified population – in which socially situated practices that actively sustain symbolic distinctions and privilege in everyday skills and practices; and (iii) the institutional (state, regulatory, educational) management of the power that skilled access to knowledge brings to the 'literate' – including a critical analysis of the public and private sector interests at stake in promoting or undermining mass media literacy.

As such:

> New forms of literacy that have emerged in the new century (such as digital literacy, media literacy, information literacy, etc.), and the fact that with technological possibilities learning has become disconnected from time and space, make digital transformation inevitable for universities (Coskun, 2015, p. 198).

As learning becomes more disconnected with time and space there is increasing pressure on universities to respond to the demand for more flexible approaches to course design and course delivery. Longhurst (2007, p. 1) argues that 'the increased importance of media communication has had a

significant effect on the nature of ordinary life in a contemporary capitalist society. Media and mobile technologies have become embedded in everyday life (Bond, 2015) and as such have altered students' everyday communication practices and expectations of learning. The increasing range of both everyday media and educational technologies has extended the types of places where students learn and they expect and demand greater flexibility in educational provision (Ellis & Goodyear, 2010). These places and spaces of learning, both physical and virtual, impact not just on the classroom environment but on other aspects of the university environment also. Libraries and how students access information through the library is no longer understood as limited to the physicality of the building or the books and papers it houses. 'Now we have the digital library as a provider of access to published digital materials through licensing, and to original resources through digitisation, but it is also clear that the digital library can to a large extent, or even solely, operate as a navigational aid: a gateway or portal to resources held in part or entirely elsewhere' (Collier, 2006, p. 335).

Furthermore, technology enhanced learning (TEL) tools through various models of e-learning, m-Learning, blended learning and have become widely adopted and, in themselves, become taken-for-granted in many HE institutions across the globe. Such initiatives are viewed as providing 'flexible learning opportunities to diverse groups of learners using a range of internet-related technologies and applications (Stansfield & Connolly, 2009, p. 72) but, as Garrison and Vaughan (2008, p. 7) the 'use of technology, viewed as a catalyst for change in learning and teaching in higher education, is actually underpinned by the demand in quality improvement practices'. Yet within the dominant climate of technotopia in HE, there is a belief that somehow more technology will solve everything, and that teaching will be delivered and learning experienced with technological precision and convenience. Many universities are technologically enabled with interactive smart boards, virtual learning environments and networked classrooms but often teaching staff lack the skill and confidence to use the technology to its full potential and students may not have the skill to engage with platforms of technology enables learning. ANT also encourages consideration of wider entities in the network such as economics and politics. Thus in this case, highlights how universities are often struggling to complete in the current economic climate and are increasingly having to design and market courses which claim to be based on innovative methods of delivery developed to be flexible and adaptable for students trying to combine full-time or part-time study with employment, the demands of families, and other life-style commitments. Drawing on the definition of flexible learning, these flexible pedagogies refer to ways of considering approaches to teaching and learning that enable student choices in their learning (Gordon, 2014). Yet is reality is remains questionable as to how much choice students actually have in their day-to-day learning experiences.

Furthermore, universities grappling with declining funding streams, increasing competition and diversification and with time-constrained cohorts of students have been forced to rethink the way they do teaching and learning (Ellis & Goodyear, 2010). In order for a 'university curriculum to have a continuously developing structure capable of fulfilling today's changing needs, it is necessary to ensure that it is technologically friendly and interdisciplinary' (Coskun, 2015, p. 203). The traditional teaching technologies, for example, the backboard and chalk, which transferred from knowledge from teacher to student have been replaced with the more participatory tools of TEL to include webinars, blogs and discussion boards which foster collaboration and cooperative student endeavour and their panoptical effect (see Foucault, 1977) can also be a powerful motivator for learning. The flipped classroom and the virtual classroom have become common terms in both pedagogical discourse, shared communication practices which foster communities of learning are now experiences for many students and celebrated in academic discourses across the globe for overcoming traditional boundaries and barriers of location and physical geography. The globalizing tendencies of modern institutions are accompanied, according to Giddens (1991) by a transformation in social life with profound implications for personal activities. The relationship between modernity and self-identity is examined in considerable depth by Giddens (1990, 1991) and his observations have interesting implications in the HE context for professional identity in relation to teaching in a late modern society characterized by the transformational change associated with digitisation. However, according to Gordon (2014, p. 22):

> The role of lectures and lecturers is still open to debate. If lectures provide directed learning and lecturers provide role models and exemplars, then a blended approach should protect and encourage students to attend and benefit from the value added of the campus experience. If there is evidence that such experiences are not valuable from a learning perspective then the age of campus-based education could be ending, but the current evidence of the effectiveness of distance and massive online learning is mixed, so for the medium term the best approach has to be utilising technology to enhance the student learning experience by enabling greater flexibility.

Thus teachers and lecturers in HE are now expected not only to be subject specialists but also skilled digital providers of knowledge – *the teacher versus the techie* - which impacts on both teaching practices and their own self-identity (Bond & Goodchild, 2010) and they have to be able to engage students not just in their lecture but online also. Email, virtual learning environments (VLEs), Skype tutorials, webinars, digital discussion boards and online marking often demand lecturers' attention outside of the traditional boundaries of the classroom. So, far from technology freeing them from the burden of traditional teaching methods and approaches, many teachers view it as

adding to their workload exponentially. Furthermore, mainstream social media like Facebook, Instagram, YouTube and Twitter and are increasing used in HE courses and by HE instructors to post to, Tweet to and interact on a daily basis with both their students and wider academic and increasingly public audiences. The so-called Martini culture of *any time, any place and anywhere*, afforded by mobile internet technologies and social media (The Guardian, March 2014) have transformed both student expectations of lecturers but also those of their managers and professional organisations. Gordon (2014, p. 4) suggests that 'e-Learning offers key opportunities for higher education to support flexible pedagogies, with the potential to assist in balancing the need for staff to carry out high quality teaching alongside high impact and significant research while at the same time managing an increasingly diverse student cohort.' However, as I have argued with my colleague in a previous empirical study these changing paradigms have a significant impact on academics' perceptions of themselves as professionals and on the role of the professional in higher education in contemporary society:

> 'There is a substantial amount of anxiety related to the use of technology which was evident throughout the data collected, ranging from the minutiae of technology failing when used, through to not being able to perform as an academic when confronted with technology. This, in combination with the technological environment which academics are presented with, led to further feelings around anxiety associated with academics' self-identity as a professional' (Bond & Goodchild, 2013, p. 81).

Furthermore, Radovanović *et al.* (2015, p. 1733) 'interpret educators' reluctance to adopt new technology as a reaction to the technology's capacity to challenge the educators' legitimacy, expertise, and preferred teaching materials.'

As Beadoin (2015, p. 34) also points out:

> quite suddenly and somewhat miraculously, less than 3 decades ago the advent of the World Wide Web, the proliferation of desktop computers on campuses, the development of e-mail, and sophisticated computer- based searching, storing, and sharing of digital information became ubiquitous in the work- place and in learning organizations, resulting in profound organizational changes. A placid domain that had long enjoyed predictable means of conducting its activities became an environment buffeted by technology-driven transitions, seen by some stakeholders as exciting and invigorating, and by others as alarming and compromising the integrity of the academy. The prospect of the professoriate's traditional role in the educational marketplace being threatened engendered fierce resistance that continues to prevail today at many institutions, despite significant adoption and widespread usage of technology-sup- ported pedagogy by

faculty and investments in the latest digital resources by administrators.

As the availability and access to technology improves, the importance of considering digital equity does not diminish (Judge *et al.,* 2004). Not everyone has equal access to technology and there remains extensive variations in knowledge, competence and confidence in technology and media use which further impacts on both digital and media literacies. In Europe, for example, young people from the higher socio-economic groups are more likely to have private and personalised access to the internet (Livingstone *et al.,* 2011). In the UK 6% of adults in households were income is low (less than £200 per week) have never used the internet (ONS, 2013) and in Britain 'rising economic inequality has negative effects, and these effects are negative for everyone in our society, even those who are becoming richer (Doring, 2013, p. 102). Such inequalities are important to the discussion here as they are all too often overlooked in favour of the dominant equalizing discourses which surround the role of technology in educational transformation. Yet very real divides remain which go beyond the digital and, as such, opportunities and choice for many young people are unequal and limited for those young people from poorer households. Furthermore, it is not only the lack of access to the information society and a dearth of chances to develop digital literacy, but also opportunities to socialise, and access community support networks are compromised. Educational policy disadvantages young people from poorer backgrounds (France, 2007) and as Selwyn, (2011, p. 717) argues there appears to be an 'acceptance that there is no technical formula for overcoming the entrenched social, political, economic and cultural issues that underpin educational "problems"'. Another assumption within the taken-for granted discourses on TEL in HE is the notions which underpin the *techno-romantic* (Selwyn, 2011) or *cybertopian* celebration (Valentine & Hollloway, 2001) of the *digital native* (Prensky, 2001). Prenksy's (2001) *digital native* versus *digital immigrant* metaphor has been called into question elsewhere (Wheeler, 2011 & Bennett *et al.,* 2008) and is significant to my argument here. Whilst there is a seemingly ubiquitous adoption of mobile internet technologies in many young people's everyday experiences it is important to remember that not all young people have equal access to either technologies or the internet generally (Bond, 2015). There is a serious problem with the idea of the *digital native* (Brown and Czerniewicz, 2010) and the idea of a *digital generation* is also problematic (Bond, 2015) as Livingstone *et al.*'s (2011) findings so clearly evidence. 'Rapid advances in technology, combined with the process of globalisation and the failure of neo-liberal governmentality to manage the complex challenges of late modernity, have led to social and cultural instabilities which have profound implications for literacy and literacy education' (Carrington & Marsh, 2005, p. 280). Across Europe there is considerable diversity of access to technologies and to the internet and, as such, not all young people

have the same levels of digital literacy and digital skills. The EU Kids online research found that there were considerable differences in levels of digital literacy and the broader concept of media literacy and that marked differences in skills persist between young people, due to gender, age and parental education and between European countries (Livingstone *et al.*, 2012). It, should, therefore, not be assumed that all young people are confident and competent to engage with learning online or to interact in a digital world. Thus digital divides remain and, may, as argued by Beaudoin (2015: p. 33) actually be widening:

> In the past 3 decades, we have witnessed the implementation and expansion of online education designed for increasingly diverse audiences worldwide via an impressive array of new instructional media. Many proponents contend that Internet-supported teaching and learning is the most important innovation in education since the printing press. Yet, less favorable critiques of this phenomenon prevail, as some social critics maintain that the introduction of technology into the teaching and learning environment represents a process of disruptive innovation that has not had any truly transformative impact, and indeed, has widened the digital divide.

However, according to the European Commission (online) 'Information and Communication Technologies (ICT) help us learn better, more efficiently and creatively, to innovate, to solve complex problems and access wider and more up-to-date knowledge. ICT provides everyone with flexible and accessible learning opportunities, in and outside the classroom.' My argument here is that much of the current rhetoric surrounding digital world and education, as exemplified in the above statement, is dangerously deterministic in that it is masking the diversity of the reality of the lived experiences of both educators and students and hiding widening digital divides. ICT does not yet provide everyone with flexible and accessible learning opportunities and we need to continue to understand the diversity and the divides in the digital economy and not assume that everyone has equal access and equal skill. The assumption that students are digitally literate because they have grown up with technology – they are *digital natives* (Prensky, 2001) is both unhelpful and misleading. Furthermore, teachers in an HE environment are now expected to have somehow gained digital literacy skills way beyond which most HEI teaching courses offer. Also as 'literacy today involves not only text, but also image and screen literacy. The ability **to** "read" multimedia texts and to feel comfortable with new, multiple-mediagenres is decidedly nontrivial (Seely Brown, 2000, pp. 13-14).

> 'It is crucial that we as educators, as academics and as educational technologists reject deterministic and exclusionary labels and actively change this discourse. ...That the world is increasingly shaped by digital technologies is not in doubt. Everyone engages somehow,

> everyone makes their own meaning; everyone mediates those technologies in one way or another. The challenge is therefore, to situate our responses in that rich diversity, rather than in exclusionary dichotomies' (Brown & Czerniewicz, 2010, p. 366).

The concept of *ecology* may be useful in moving this debate forward and situating our responses in the rich diversity of reality as *ecologies of learning* in that 'an ecology is basically an open, complex, adaptive system comprising elements that are dynamic and interdependent. One of the things that makes an ecology so powerful and adaptive to new environments is its diversity' (Seely Brown, 2000, p. 19). We need to find a more democratic lens with which to view the relationship between digital world and education and, as Croteau and Hoyes (2003, p. 319) suggest, we need to understand how technologies develop, how people use them, and what this means for broader patterns of social communication. According to Law (1999, p. 10) previous approaches to society and technology have bene based on technological determinism (technical acts as explanation) or social reductionism (expression of social relations): 'Nothing is purely technical. Neither is anything purely social. And at the same can be said for the economic, the political, the scientific and all the rest' – it, is therefore, a mistake to ignore the networks of heterogeneous materials that constitute the social. Actor Network Theory (ANT) argues that social life cannot be understood as either human or technical as neither human nor technology controls the resulting patterns of relationships. As ANT rejects the assumptions that society is constructed through human action and meaning alone and views society as produced through the mutually constituting interaction of a wide range of human and non-human entities (including machine and technologies) (Prout, 1996, 198). Therefore, I suggest that it is more helpful to reexamine our understanding of the digital world and education through ANT as:

> The actors in these networks redefine each other in action in ways which mean that there are no simple one-to-one relationships from technology to people but rather a constantly on-going, constantly inventive and constantly reciprocal process of acquaintance and reaquaintance (Thrift, 1996, p. 1485).

ANT is critical of sociological approaches which adopt a dualistic approach to explaining social life and argues that the latter cannot be understood as either technical or human and, as Murdoch, (2001) observes in traditional sociological approaches the conceptualizing of humans and non-humans limits a more in-depth understanding of both environmental and social problems. If we are to better understand the complex interrelationship between teaching, learning and technology in HE we need to adopt a more democratic and ecological approach. By heralding the digital world as the hero in transforming education we are overlooking the hybridity of the network in

which the learning actually takes place and denying the rich ecology of the reality. Arguably, as ANT directed sociology to confront the new hybrid world (Murdoch, 2001, p. 114) there are significant opportunities to explore and examine the challenges and tensions arising in the ecology of everyday world of higher education.

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