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## The modern university in the digital age

### Briefing paper summary

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# The Modern University in the Digital Age

## Briefing Paper Summary

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### The Brief

Investigate the current thinking, research, practice and theoretical frameworks around the question, 'What does a modern university look like in the digital age?'

### The Method

An extensive review of the recent literature was conducted using search terms such as 'digital age', 'connected', 'web 2.0', 'challenges', 'e-learning', 'higher education', 'university', 'social media' and 'pedagogy', along with a variety of platform-specific and current theoretical and practice related terms. This literature review was reinforced with a call for contributions from staff engaged with the University eCentre as well as input from a variety of practitioners in e-learning, educational development and employability from around the UK and Europe. We posed the question 'What does a modern university look like in a digital age?' and received over thirty responses suggesting reports, literature and research data, as well as some personal opinions and positions. These were integrated into a briefing paper. From this we identified six key headlines, as well as suggesting a conclusion.

### Key Headlines

#### Activity vs. impact

Over the last decade, there have been a significant number of examples where practice change has occurred as a result of, or in concordance with, technology, technology-enhanced learning, social networking and e-learning. These have been primarily located within smaller discipline-based projects, sometimes cross-institutional or inter-disciplinary. There is little evidence of institutional-wide change. A number of potential causes have been identified including a lack of institutional and staff experience with technology and a predilection towards replicating existing practice on new technological platforms as opposed to identifying a new pedagogy more in tune with the changing needs of learners and the community (including employers).

#### Instruments

Learning platforms and devices are the infrastructure underpinning many modern e-learning approaches. They are becoming increasingly corporatised, packaged and licensed. Educational technology has become expensive to purchase, proprietary and frequently unique and customised to an institution and therefore often requiring the protection of firewalls and closed systems. A tension arises where learners bring skills to higher education built on open systems, secure to maintain privacy but free to access and share. They produce content at no cost on these platforms and share them with a network of their choosing or wider. This is made even more complex when the higher education institution becomes focused on an instrument or platform and not on the reason for using that instrument or platform. This has led to a common mantra of 'pedagogy before technology' where the reason for using the technology is underpinned by pedagogical approaches to learning, teaching and assessment. Taking this a step further, there is a movement that sees technology as a way of developing new approaches to the existing pedagogy as opposed to challenging the need for a new pedagogy. A common example in the literature is the role and function of a VLE, which can be reduced to a

lowest common denominator as a replication of a classroom, a file repository or an administrative system, all at significant institutional cost but little change to the existing pedagogy. However, used effectively, in specific circumstances, a VLE-led teaching, learning and assessment strategy can initiate and facilitate a different model of learning, acting as a gateway to rich media content, supporting collaborative construction of knowledge and skills and forming interactive networks. The same aim could be achieved through a variety of technology-led practices (and arguably in face-to-face contexts as well). The critical aspect here is the evaluation of learners' skills and needs and the development of an appropriate pedagogy.

### **The need for 'pedagogy 2.0'**

As identified in the earlier headlines, there have been a number of calls within the literature for a new pedagogy. A pedagogy that embeds the new skills of learners in collaboration, content making, remixing and repurposing, interaction, identity and sharing into a curriculum that encourages social interaction, supports the development of networks through social media, broadens the community of practice to include a wider community of practice and promotes and generates inter and trans-disciplinary thought and ideas. McLoughlin and Lee (2007) have proposed a new model of pedagogy for the modern university, which they have called pedagogy 2.0. Linking inter-disciplinary content, dynamic curriculum, open communications, iterative and inquiring processes, multimedia and rich learning resources, a vibrant and sympathetic networks for learning and experiential and learner-centred tasks including assessment, pedagogy 2.0 takes a holistic learning approach to developing the learning, teaching and assessment strategy which encourages learner autonomy and personalised learning (Dron 2006; Grosseck 2009; McLoughlin & Lee 2008).

### **Social Interaction and social construction of knowledge**

The fundamental importance of moving away from a transmissive or broadcast model of learning and towards an inclusive, collaborative, socially interactive model has been argued extensively in literature and practice. At an institutional level, the integration of these practices at all stages of the student experience, including pre-entry, entry and exit, requires shifts to university attitudes and practices around systems access, lifelong learning, experiential learning, mentoring and alumni. Tapscott and Williams (2010) argue that collaborative learning, collaborative knowledge production, and the supporting of the skills required by university management, academics and administration, to facilitate collaborative practice, represent the necessary future of the modern higher education institution. A fully integrated web 2.0 approach linked with a pedagogy that is designed to fully utilise the benefits of social construction and collaboration requires significant change to both the practice of teaching and the practice of learning.

### **Connectivism**

The idea that learning is predicated on the connections learners are able to create, maintain, develop and share both inside and outside the institution is at the heart of connectivism, a theory put forward by George Siemens (2005) and Stephen Downes (2009). Building on the well-established concepts of social constructivism, both Siemens and Downes argue for learning and skills to be part of a wider toolkit that can be used as required during the learning journey, allowing the learner to take an active role in their own learning. This model of social interaction and social construction of knowledge, along with the conceptual framework of ideas such as communities of practice and social networking underpin a number of theoretical models and positions on modern learning such as collaborative practice, community-led learning, open pedagogies, participatory learning and web 2.0 led learning.

### **The learner**

Arguably, the modern learner is not the same as the generations that went before them. Whether this is explained by the notion of young people being digital natives in terms of their engagement and use of technology (Prensky 2001) or simply that the instruments of modern education in use from pre-school level have changed to include technology, the learner generally arrives at university with a digital backpack of

devices, skills and an already existing, or perhaps nascent set of connections and networks. Jenkins (2009) categorises these skills more widely, suggesting that modern learners possess a variety of skills that have emerged from their interaction with web 2.0 technologies, including (but not limited to) the skills of play (problem solving through experimentation), performance (discovery through the adoption of alternative identities), simulation (interpretation of models of real-world processes), appropriation (remix and reuse of media content in the form of 'mash-up'), multi-tasking (focus shifting required by the situation), distributed cognition (the use of tools to expand skills and thinking capacity), collective intelligence (the use and validation of pooled knowledge to solve problems), judgement (evaluation of the reliability and validity of information), trans media navigation, negotiation and networking.

## Conclusion

The challenge for the modern university in the digital age is a complex one involving

- the impact of technological change on its operations,
- the changing needs of learners who seek an interactive, collaborative and innovative learning experience that builds on and develops their skills,
- curriculum development and design including the incorporation of OERs
- the requirements of business and industry which is itself changing in relation to technology.

The 2012 Horizon report notes that biggest challenges for higher education over the next five years will be to move from mobile apps and an 'access and device' mentality to the realisation of the idea of the 'Internet of things' where objects, processes and location all contribute to knowledge and where the critical use of 'learning analytics' could be used to assess student progress instead of simple, summative and formative assessment (Johnson, Adams & Cummins 2012). These represent single opinions in a complex web of future thinking and innovation. What is clear is that the future will be built on social interaction, social connectivity, social knowledge construction and collaboration. Learners will be in control of their learning spaces, the professional image and their own networks. Institutions will play a key role in supporting these processes; however, it will arguably be different from the role the university plays now.

## Implications

The position of the university as being a three year experience beginning with registration and ending with graduation is under challenge. Learners bring with them devices, skills, practice and knowledge that can support their development through the university experience. They leave the university with those skills enhanced, developed, challenged, repurposed and ready for sharing. Yet, at the completion of the qualification, aside from an alumni process, the university rarely engages them in continuing to interact with new learners or with the networks they formed whilst studying. The ability of web 2.0 technologies and social media to facilitate the formation of these networks, develop and nurture connections within a community and maintain a current and relevant personal web presence for individuals is unquestioned and well evidenced. The challenge for the modern university is to build this type of connectivity into the practices and strategic direction of the institution. From new arrivals experiences, through to curriculum design, learning, teaching and assessment, social interaction in and out of the 'classroom', infrastructure strategy and learning spaces and post-graduation processes, the ability of the learner, the academic, the administration and management, the employer and the community to interact, engage and maintain connections is central to the ability to flourish in the new environment. There is significant potential for developing a USP around the development of networks and networked learning with strategic alignment in particular between teaching, learning and assessment and technology.



# The Modern University in the Digital Age

## Briefing Paper

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### 1. Introduction

*'Education is an illusion if it simply disseminates information' (Garrison & Anderson 2003)*

The purpose of this briefing paper is to summarise the recent literature and thinking on the role, shape and practices of a modern university in the digital age. The modern university faces significant challenges over the next five years in an environment where there are exponential shifts in information acquisition, work practices and knowledge construction. The modern learner comes to their higher education with a different and arguably more agile set of skills in research, communications, creativity and discovery (McHaney & Daniel 2011). The concept of academic disciplines, which had previously been at the forefront of the structure and operations of the University, have been challenged by ideas such as inter-disciplinarity, participation and collaboration (Jacobs & Frickel 2009; Taylor 2010).

E-learning is a challenged and contested practice, with debates around its role as an instrument of learning, a theory of learning or as some argue, whether it is an inter-disciplinary practice (Jones et al. 2009; Njenga & Fourie 2008). Sangrà, Vlachopoulos & Cabrera (2012) note that '...e-learning is part of the new dynamic that characterises educational systems at the start of the 21st century, resulting from the merge of different disciplines, such as computer science, communication technology, and pedagogy' (Sangrà, Vlachopoulos & Cabrera 2012), whilst Jones et al. (2009) comment that e-learning is an essentially disruptive process for which universities are not adequately prepared to face. Connolly, Jones and Turner (2006) suggest a grim future of higher education institutions that don't address the infrastructure and pedagogical issues associated with e-learning;

*'If e-learning is a disruptive technology, then the next two decades will require a dramatic restructuring of HE. We would prefer to see a planned transition in which universities planned to learn how to implement e-learning, than to wait for universities to be put out of business by new organisations that have been quicker to understand what e-learning can be used for.'* (Connolly, Jones & Turner 2006)

Beetham and Sharpe (2007) note that the mantra of 'pedagogy before technology' often positions e-learning within the context of existing pedagogies or alternately represents the opposite criticism of higher education in that it implements technological initiatives with little or any thought for the pedagogical use or impact.

The debates interrogating the principles and practice that will constitute the 'new' university, 'new' pedagogies and the learning, teaching and research functions of the digital age have been raging for nearly two decades (for example; Bailey & Cotlar 1994; Hillman, Willis & Gunawardena 1994; Taylor 1995). There are

thousands of examples of individual projects both here in the UK and around the sector globally where small and medium scale applications of e-learning, web 2.0 technologies, infrastructure investment or new pedagogies have been implemented and evaluated to varying degrees of success (Smith 2012). There is little evidence that there has been institutional level change, in terms of teaching, learning and assessment or pedagogical strategy, aside from changes in administrative processes connected to those strategies or to enshrine within them the didactic content-driven transmissive models of the existing pedagogy. Nor has there been the associated promised revenue generation or cost savings (Blin & Munro 2008; Kirkwood 2009; MacKeogh & Fox 2008; Stepanyan, Littlejohn & Margaryan 2010). The challenge for the modern university is to make these changes on the larger scale; across the institution, through the entire provision and within a variety of linked or dislocated processes, so that they impact the very core of what it means to be a modern university in the digital age, without losing what makes higher education unique.

It is clear that the modern university will not look the same as it does now. The challenges and significant changes that the digital age represents cannot afford to be reacted to by putting a new coat of paint on an old car. The modern university will have to adapt to a world that is looking for new ways to get from point A to point B, driven and navigated by learners and a community that are not necessarily constrained by roads or engines.

*'It is often very tempting first to draw a simplified picture of the role of the teacher in "traditional" or even "old-fashioned" education and then present contrasting visions of a new role in the future. In my opinion, there is too much easy and superficial talk about revolutions and paradigm shifts in education. Revolutions don't happen that often...' (Ljoså 1998)*

*'...educational policymakers have not learned anything from these decades of research, whose recurring theme has been the complexity (if not outright failure) of educational change and the inadequacy of so many reform ideas...we have so little evidence that anyone has learned anything new about the processes of teaching and schooling beyond the confines of their own personal locations.'* (Bascia & Hargreaves 2000)

This briefing paper is divided into four sections, looking at the literature, policy and practice-based research that inform the wider debate around role and position of the modern university in the digital age.

The first section 'The Modern University in a Digital Age' takes a macro-level view, identifying the structural and organisational issues that technology has brought out for universities, as well as the threats and risks posed by responding or not responding to these issues. The second section looks at learning, teaching and assessment in the context of the arguments for and against the development and implementation of a new pedagogy for higher education. The third section, 'Infrastructure and Environment' argues that any technological change in a university is accompanied by calls for changes in infrastructure and learning spaces. The fourth section, 'The learner and the way they will experience learning', summarises the literature around the changing nature of the modern learner, the new skills they bring to higher education and the skills backpack they will need to enter a changing digital workforce.

## 2. The Modern University in a Digital Age

*'The traditional university boundaries are blurring, not just because technology is making it possible, but also as a result of the burgeoning demand for education beyond campus and the undergraduate*

*years. Technology can help higher education meet this demand by reshaping the university and extending its reach across time and space.’ (Brown 2001)*

## 2.1 Introduction

A number of intellectual theorists and futurists in higher education argue that, at this time and at this juncture, technology will be the greatest instrument of change for higher education and that universities are facing the most significant challenges in their history as a result of the impact of technology on their learners and their way of learning (for example; Brown 2001; Brown & Adler 2008; Connolly, Jones & Turner 2006; Garrison & Anderson 2003; Greenhow, Robelia & Hughes 2009; Kamenetz 2010; Keats & Schmidt 2007; Knight 2009; Njenga & Fourie 2008). Yet, with all of this debate, research and dialogue, as Bascia and Hargreaves (2000) noted, there is little evidence that wider, macro-level change arising directly or indirectly from technology and its impacts on pedagogy and learners has occurred within institutions. There are thousands of individual projects, cross-institutional and even international looking at elements of the relationship between technology and higher education, but very little to suggest that e-learning and technology has become the predominant pedagogical instrument in the modern university.

It is clear that a modern university is not a solely online experience; almost every institution with some exceptions (the new private online universities in the United States such as the University of Phoenix for example) delivers higher education with variable mix of modes including online, community engagement and the on-campus experience. Other modes of teaching and learning such as work-based learning, employer led-learning and post-graduate research sit within a combination or variation of the primary three. There is significant literature to support the assertion that a pedagogy that integrates all three modes enhances the learner experience and as well as the measurable and tacit learner outcomes, more so than any of the individual modes used by themselves (Kamenetz 2010; Means et al. 2009).

This is not a one-way transaction. The modern learners engaging in new pedagogies are often critically engaged, autonomous, collaborative and connected. They use technology to pose and solve problems. The tools many of them utilise every day represent the next generation of technology, leaving the ones that many institutions are struggling to implement in programme delivery as out-of date (Barnes & Tynan 2007). Learners consume information in ways that are in conflict with the some of the notions of the traditional pedagogy replacing the didactic idea of ‘I will tell will you what I know’ and relying more on the assertion that ‘I will find out what I need to know’. Brown (2001) summarises this tension by observing;

*‘...(learners) communicate in a language that many academics don’t yet understand. It’s an ever-evolving language of interpretation and expression, an interactive approach to learning, creating, and responding to information through a complex montage of images, sound, and communication. Students are pushing learning into a new dimension; it’s a mistake to continue to try to teach them in time-worn ways. Their choices of communication need to be diversified to include, for example, visual interpretations of texts and historical figures or soundtracks for poetry. Students can take advantage of the enormous resources of the Web, transforming what they find there by using digital technologies to create something new and expressive.’(Brown 2001)*

These fundamental shifts in the nature of the learner represent significant threats for the modern university in the digital age. Sources of knowledge (along with the learner’s ability to aggregate, re-use and share them) have increased exponentially. Tapscott and Williams (2010) suggest that the current pedagogies of higher education are under threat because people can find the knowledge they need and learn from that in a variety of different contexts and from spaces and networks outside the academy. Kamenetz (2010) argues that it is the time for learners to leave the university behind because technology has facilitated the ability of learning to

disavow 'expensive institutions' and replace them with 'expansive' institutions rooted in the true, original meanings of the words 'university' and 'college'. Whilst the university provides the accreditation and certification of achievement through degree awarding and quality assured assessment, Tapscott and Williams (2010) challenge the longevity of this uniqueness;

*'The value of a credential and even the prestige of a university are rooted in its effectiveness as a learning institution. If these institutions are shown to be inferior to alternative learning environments, their capacity to credential will surely diminish. How much longer will, say, a Harvard undergraduate degree, taught mostly through lectures by teaching assistants in large classes, be able to compete in status with the small class size of liberal arts colleges or the superior delivery systems that harness the new models of learning?' (Tapscott & Williams 2010)*

The views of both Tapscott and Williams (2010) and Kamenetz (2010) are perhaps a little sensationalist, but they do cut to the heart of the argument around the value, both in terms of prestige and financial equity, of the reputation of a modern university. In the broader context, the offering of thousands of free online courses by Harvard and MIT and the co-operative partnership EdX and the growing MOOC movement where universities such as Stanford offer credit bearing courses for hundreds of thousands of learners suggest that whilst these 'high reputation' institutions value their brand, they see additional value gained from diversifying and multiplying it for a mass audience. Linked to the debates on Open Educational Resources (OERs), a number of writers are now arguing that the process of making resources open actually enhances the reputation and brand of the university (Browne et al. 2010; De Liddo et al. 2012; Ossiannilsson & Creelman 2012). Ossiannilsson & Creelman (2012) suggest that 'innovative universities are realizing that openness does not mean cannibalizing the traditional core business and that free sharing of materials can rather strengthen reputation and influence'.

## 2.2. Technology and social interaction

*'Constructing personal meaning is enabled by opportunities to test ones understandings in a social context and to apply new ideas and solutions in relevant contexts' (Garrison & Anderson 2003)*

Independent of (or at least concurrent to) the research into the impacts of technology and web 2.0 on higher education, there has been significant research into the conceptual nature and the practices of social interaction and social construction of knowledge, as concepts critical to the enhancement of student outcomes, student motivation and learning (see Brown & Adler 2008; Light 2001; Nonaka 1994; Siemens & Weller 2011; Taylor 2010; Trowler 2005). The power of technology and the constantly improving platforms for social interaction, collaboration and networking provided by web 2.0 provide the modern university with instruments to develop an open community, one which engages and involves alumni, industry, local community, cultural organisations in the activities and process of teaching and learning and provides ways in which current, past and future learners can interact, make connections, form networks and learn from each other.

Technology is the instrument that can open the university, facilitating both autonomy and collaboration. Knowledge can be built 'organically' and individual experience can be recognised within the wider context of societal norms. It can facilitate the university to become a learning community, which seeks to provide lasting and on-going membership, continuous engagement and the development and nurturing of connections between members, with Garrison and Anderson (2003) referring to this process as a '...critical community of learners where learners become ...cognitively independent but socially interdependent (with) teachers and students transacting with the specific purpose of facilitating, constructing and validating understanding, and of developing capabilities that will lead to further learning' (Garrison & Anderson 2003).



## 2.3 The meta-university

The concept of the meta-university is where the university is an open and porous community, breaking down barriers within the institution and across institutions, forming centres of excellence and encouraging inter-disciplinary and cross- institutional participation and co-operation. Taylor (2010) argues that in order for a modern university to thrive, collaborations and connections need to be formed across institutions, to facilitate the learner to seek information from the sources where excellence is produced and demonstrated through high-quality research, engaged academic staff and media-rich resources. This collaborative provision is already occurring in pockets of higher education activity, such as the OERs provided by MIT and Harvard, the MOOCs (Massive Online Open Courses) delivered by the University of Saskatchewan and Stanford and resource development of educational organisations such as the Khan Academy, TED and the iTunes U.

*‘My view is that in the open-access movement, we are seeing the early emergence of a meta-university—a transcendent, accessible, empowering, dynamic, communally constructed framework of open materials and platforms on which much of higher education worldwide can be constructed or enhanced. The Internet and the Web will provide the communication infrastructure, and the open access movement and its derivatives will provide much of the knowledge and information infrastructure.’ (Vest 2006)*

Tapscott and Williams (2010) argue that the university of the 21<sup>st</sup> Century will not be a tower, but rather a network, comprised of learners, academics, the community, industry and more broadly those who generate and make content and knowledge (echoing Peter Drucker’s 1997 prediction that the residential University will be a ‘relic’ or that of William Wulf (1995), President of the US National Academy of Engineering when he asked; ‘Can an institution such as the University which has existed for a millennium and become an icon of our social fabric disappear in just a few decades because of technology? If you doubt it, just check on the state of the family farm’).

Writers such as Friedman, Friedman and Pollack (2008), amongst others, argue that there needs to be convergence of knowledge and disciplines where skills and knowledge are versatile, agile and can ‘fit’ across multiple contexts. This is not actively supported by the continuing adherence to the ideas of a Humboldt style university, where knowledge is becoming increasingly fractured, departments are specialising to the point where there is no room for inter-disciplinary thought, publishing and research is increasingly predicated on narrow specialisation and curriculum follows suit (Friedman, Friedman & Pollack 2008; Manlow, Friedman & Friedman 2010; Taylor 2010). There are a number of emergent collaborative frameworks and practices summarised in Haythornthwaite et al (2007), looking at ways that modern universities can facilitate interaction and co-operation between staff and the community. These include the notion of community-embedded learning where knowledge is transferred between the community and social world members such as learners through the facilitation of frequent interactions within the community enhanced by web 2.0 technologies (Haythornthwaite et al. 2007; Kazmer 2005), and braided learning where the use of a collaborative on-line platform seeks to form a community of practice within an institution that supports staff to ‘...understand and participate in a creative, progressive ‘braiding’ of text, opinions, and ideas.’ (Haythornthwaite et al. 2007; Preston 2008).

At this macro-level, it is clear that seismic change is occurring both in the environment universities operate in and in the organisational strategies they employ to grow and develop in those environments. Whilst there is no universal agreement as to the overall impact of technology on the institution, at both mezzo and micro levels (discipline and programme) the research does coalesce around the need for higher education to recognise, analyse and respond to the impacts of technology on society, on the learner and on the work they

will do once they leave the institution. This approach needs to be strategic and not reactive to the latest piece of technology or commercialised platform pitch, but centred in a clear understanding of what needs to be achieved through an engaging and relevant pedagogy, supported by the structures of the university, the way it rewards innovation and creativity, trains its staff, approaches the intellectual property rights of the institution, identifies the needs and skills of its learners and delivers its learning, teaching and assessment.

### 3. Learning, Teaching and Assessment – pedagogy 2.0?

#### 3.1 A university wide approach?

*"It's not about matching traditional models with existing tools anymore; It's about developing a brand-new pedagogical model and implementing the Next generation Web environment upon it."  
(Fumero et al. 2006)*

As noted earlier, there has been significant debate around the role of technology in facilitating change within learning and teaching practice, supporting either the end of the university as we know it or its re-birth as an information hub for the digital community supporting employability and learning for engaged learners (Baer 1998; Grossek 2009; Pearce et al. 2011; Taylor 2010). However, the pace of change within institutions globally has traditionally been slow. Davidson and Goldberg (2009) argue that *'...institutions of learning have changed far more slowly than the modes of inventive, collaborative, participatory learning offered by the Internet and an array of contemporary mobile technologies'*. There have been a number of studies that attempted to identify the reason for this organisational latency, usually in the context of specific project-level evaluations of e-learning within institutions. Whilst these studies were often limited in their scope, they attempted to make wider, more generalisable comments about the effectiveness of e-learning at an institutional level.

- A number of studies have questioned the impact on student achievement, retention and learning of e-learning alone as an instrument of learning and teaching, without the development and support of effective and engaging learner interaction, either learner-learner and/or learner-teacher (Bråten & Strųmsų 2006; Chen, Lambert & Guidry 2010; Nora & Snyder 2009; Wilson & Stacey 2011)
- O'Donnell and Sharp (2012) observed that academics are often asked to develop e-learning materials without having experienced learning in the online environment themselves nor having *'...even considered the pedagogical impact that technology can have on the students' learning experience'* (O'Donnell & Sharp 2012).
- A ten year study by Jackson et al (2011) argued that students themselves preferred lectures, written hand-outs and class-based discussions over technology-led pedagogies, suggesting that the importance of technology at an institutional level has been overstated.
- Bowden and D'Alessandro (2011) identified new technology had little or no effect on the student experience, noting that *'...one would assume that the mere novelty of introducing a new technology into the classroom would stimulate curiosity and interest.'*
- Selim (2007) identified a significant number of factors that would enhance student usage of e-learning within university flagging criteria such as instructor attitudes towards the technology, the learners computer competence, the University infrastructure and ease with which the student could access the technology.
- Wilson and Stacey (2011) argue that one of the critical factors that have impacted on institutional acceptance of e-learning has been pattern of innovation diffusion that results from the differing paces of staff acceptance of change.
- Baer (1998) notes that the modern University is making use of the internet in two markedly different modes. The first *'better, faster, cheaper'* mode supports the digitisation of research, high-speed

infrastructure, the transition of printed materials to a VLE and movement of classrooms away from bricks and mortar. The second model argues for a more radical shift in not just technology but in pedagogy allowing for 'into student-centred learning rather than institution and faculty-centred instruction' supporting the development of agile institutions which develop collaborative partnerships and make direct connections with learners and the community.

- Rollett et al (2007) advocates strongly the social benefits of using web 2.0 technologies in higher education but sound a note of caution suggesting that institutions will have significant difficulty creating the conditions for supporting the 'trust, openness, voluntariness and self-organisation' that arises from web 2.0.

Understanding the impact of technology on the strategic direction and practices of the modern university is not so much a debate about the technology itself, but more about as Garrison and Anderson (2003) note technology's role in '...facilitating communication and thinking thereby construct(ing) meaning and knowledge'. It is the set of behaviours associated with social interaction and communication that has the greatest potential to shape the teaching and learning in higher education. Some of the current e-learning practices in higher education simply replicate the existing modes of student/teacher engagement by using a different technology to facilitate the a similar broadcast mode of learning (Barnes & Tynan 2007; Hanley 2011). Barnes and Tynan (2007) observe, perhaps a little cynically;

*'As we have seen, the likelihood is that educators will engage with Web 2.0 technologies in the same old ways. As Kirkup and Kirkwood (2005) have shown, teaching staff in higher education will probably employ the latest technologies to teach much as they have done in the past, if left to their own devices. To the extent that, say, podcasting has begun to make an impact in higher education, this has already happened. Most podcasts are last year's lecture in digital format. Student remixing of podcasts, use of syndication to pool collective responses and other more active learning approaches are losing out to those that see podcasting as a high-tech alternative to the audio cassette of the 1980s.'* (Barnes & Tynan 2007)

Using technology to simply replicate existing practice does not actively support social construction of knowledge. Either through a lack of skill or mismatch between the understanding of the academy and the needs and skills of the learner may e-learning projects have simply become lecture 2.0 or tutorial 2.0, without appropriate thought to changing the pedagogy (Blin & Munro 2008). A discussion forum where the lecturer simply poses a question and asks the learners to 'discuss' does not ground the interactions either vertically or horizontally (between learners, other learners and academics). Using YouTube instead of a VHS recording, allowing the VLE to act as a file repository or a way of replicating the classroom virtually ignores the obvious benefits that technology can bring to enhance pedagogy. Hemmi, Bayne and Land (2009) note, VLE's can create a 'conservative dependence on pre-digital metaphors, signs and practices which are increasingly anachronistic as digital modes gain in social and cultural significance'.

*'In practical terms, classroom technologies must be critically evaluated, analysed self-reflexively, and understood as part of broader cultural, economic, and political contexts. Inviting students to think critically about both the tools of technology and the uses to which they may be deployed is an empowering gesture that resonates at every level of educational exchange.'* (Anderson & Balsamo 2007)

### 3.2 Web 2.0 technologies

*'Our understanding of content is socially constructed through conversations about that content and through grounded interactions, especially with others, around problems or actions.'*(Brown & Adler 2008).

Social networking has had significant impacts on the way we connect with people. Web 2.0 technologies support more than user interactivity, they support the development and application of user-generated content, collaborative learning, network formation, critical inquiry, relationship building, information literacy, dynamic searching and reflection (Fischer 2009; Hong et al. 2008; Tapscott & Williams 2010).

In terms of higher education, there has been a number of studies that argue for the role of web 2.0 platforms in the enhancement of communications, challenging the orthodoxies of the learner/teacher relationship or as a replication of the classroom or virtual learning environment (for example Conole 2010; Kop & Hill 2008; Rollett et al. 2007). Similar to the wider e-learning and technology discourse, there is little empirical evidence of the impact of web 2.0 technologies on higher education, either in terms of student learning or in comparison to other modes of teaching and learning (Siemens & Weller 2011). This seems to be in sharp contrast to the obvious and undeniable impacts web 2.0 technologies have had in general on interaction, collaboration, creativity and community building (Andersen 2007; Giustini 2006; O'Reilly 2006; Valtysson 2010).

Richmond, Rochefort and Hitch (2011) and Foroughi (2011) both note that the effectiveness of web 2.0 implementation within teaching and learning strategy identifying the skills development of the academic staff and the seamless integration of web 2.0 interaction and engagement in curriculum design and delivery (as opposed to being an 'add-on') as critical. Whilst there is in organisational responsibility to provide training, infrastructure and an administrative system that supports this change, Siemens and Weller (2011) argue there is an equal shift in the role of the academic;

*'Tasks that were previously the domains of faculty are now under the control of learners: searching for information, creating spaces of interaction, forming learning networks, and so on. Through blogs, wikis, online video, podcasts and open educational resources, learners are able to access content from leading lecturers and researchers around the world. Through the use of social media, learners are able to engage and interact with each other (and in some cases, directly with researchers and faculty).'*(Siemens & Weller 2011)

### 3.3 Collaborative learning

*'If one views learning as a largely social enterprise, as many do, then the new forms of socialization that social networks afford seem ready-made for adoption into higher education'* (Siemens & Weller 2011)

Tapscott and Williams (2010) argue that collaborative learning, collaborative knowledge production, and the supporting of the acquisition of skills required by university management, academics and administration, to facilitate collaborative practice, represent the necessary future of the modern higher education institution. A fully integrated web 2.0 approach linked with a pedagogy that is designed to utilise the benefits of social construction and collaboration requires significant change to both the practice of teaching and the practice of learning (Biggam 2004; Haythornthwaite 2009).

Davidson and Goldberg (2009) observed that *'...too many conventional modes of learning tend to be passive, lecture driven, hierarchical, and largely unidirectional from instructor to student'*. Grosseck (2009) expands the

scope of web 2.0 technologies suggesting that they have the potential to change not just learner/academic interaction but change the nature of collaboration within and between institutions, colleagues and community members. However Davidson and Golderberg (2009) sound a note of caution by suggesting that University administration and academic assessment structures need to be in line with a new collective and collaborative paradigm;

*'Digital technologies increasingly enable and encourage social networking and interactive, collaborative engagements, including those implicating and impacting learning. And yet traditional learning institutions, whether K–12 or institutions of higher learning, continue to privilege individualized performance in assessments and reward structures.'* (Davidson & Goldberg 2009)

The development of collaborative learning environments and social interactivity will play a fundamental role in shaping the structure and function of modern higher education. It influences the curriculum design, teaching, learning and assessment processes at a base level, with social engagement built in from the ground up drawing on the strengths and transformative ability of web 2.0 and social technology (Boyd 2007; McLoughlin & Lee 2007). The continued reliance on an assessment system that requires and privileges an assertion of individual understanding is not modern learning. It is memory, it is absorption and it is repetition; it is not application, use, social contextualisation and collaboration (Anderson 2008; Brown 2001; Hemmi, Bayne & Land 2009; Land & Bayne 2008; Lee & McLoughlin 2007; Wheeler, Yeomans & Wheeler 2008).

*'...it's through participation in communities that deep learning occurs. People don't learn to become physicists by memorizing formulas; rather it's the implicit practices that matter most. Indeed, knowing only the explicit, mouthing the formulas, is exactly what gives an outsider away. Insiders know more. By coming to inhabit the relevant community, they get to know not just the "standard" answers, but the real questions, sensibilities, and aesthetics, and why they matter.'* (Brown 2001)

McLoughlin & Lee (2007) amongst others (see Conole 2012; Franklin & Harmelen 2007; Fumero et al. 2006; Tapscott & Williams 2010) argue that the modern University needs to 're-boot' its pedagogical approach, critically evaluate the way it engages with teaching and strategy, develop tools and processes that support innovation and creativity and position the strategic direction of the University provision within the domains of content and knowledge creation, collaboration and sharing (and discovery), relationship building (connectivity and social connections) and 'knowledge and information aggregation'. McLoughlin and Lee (2007) have proposed a new model of pedagogy for the modern university, which they have called pedagogy 2.0. Linking inter-disciplinary content, dynamic curriculum, open communications, iterative and inquiring processes, multimedia and rich learning resources, a vibrant and sympathetic networks for learning and experiential and learner centred learning tasks including assessment, pedagogy 2.0 takes a whole of learning approach to developing the learning, teaching and assessment strategy which encourages learner autonomy and personalised learning (Dron 2006; Grosseck 2009; McLoughlin & Lee 2008).

Critically, McLoughlin and Lee (2007) argue that for the new pedagogy to be effective for the learners, the institution needs to cede learner autonomy, learner choice and learner control, a difficult thing for the institution to hand over. This kind of learner-led approach is linked closely with Problem Based, Inquiry Based and Work Based Learning approaches, all of which argue for learner-led inquiry, critical and trans-disciplinary approaches to knowledge construction and application and the social construction of knowledge through interactivity and choice (Bryant, Durrant & Akinleye 2013; Desharnais & Limson 2007; Garnett 2001; Wheeler 2009).

### 3.4 Connected pedagogies

*'Learning is a remarkably social process. In truth, it occurs not as a response to teaching, but rather as a result of a social framework that fosters learning. To succeed in our struggle to build technology and new media to support learning, we must move far beyond the traditional view of teaching as delivery of information.'* (Brown 2001)

*"If it were possible to define generally the mission of education, it could be said that its fundamental purpose is to ensure that all students benefit from learning in ways that allow them to participate fully in public, community, and economic life."* (Cope & Kalantzis 2000)

The idea of connected learning has evolved from the extensive literature around the notions of social constructivism in higher education (Bostock 1998; Fosnot 1996; Jonassen, Mayes & McAleese 1993). Connectivists argue that learning occurs in a variety of often non-related and sometimes non-human spaces and that there is an inherent skill in having 'the capacity to know more', the ability to find the connections between the diversity of opinion in these spaces and to maintain these connections (Downes 2006, 2009; Siemens 2004, 2005). Connectivism adapts (contextualises) constructivism for a digital age by advocating for the importance of currency and relevancy in decision making and knowledge construction arguing that;

*'...choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality. While there is a right answer now, it may be wrong tomorrow due to alterations in the information climate affecting the decision'* (Siemens 2005).

The uncertainty and complexity extant in learning in a connected environment provide the learner and the teacher with an opportunity to experiment, both with technology and with ideas, constructs and practice (Bell 2009; Friedman & Phillips 2004). Connectivism also argues that the ability to see connections between ideas located within the frame of up-to-date knowledge and 'diverse, often opposing views' supports learner decision making and ultimately learning itself (Siemens 2004). Critics of connectivism such as Kop and Hill (2008) and Bell (2010) argue that the concept is more related to the level of curriculum design or as an epistemology as opposed to being a learning theory, but do observe the ability of connected learners to take an active role in their own learning.

*'The learning process is cyclical, in that learners will connect to a network to share and find new information, will modify their beliefs on the basis of new learning, and will then connect to a network to share these realizations and find new information once more.'* (Kop & Hill 2008)

*'It's about an educated person taking this vast river of data and information available nowadays at their fingertips and creating a context in which the information makes sense and can be understood. Value exists less and less in the pure data or in the pure information and more and more in the implicit, in people and in their context'* (Herz 2005)

### 3.5 Participatory learning

*'Participatory learning is happening now—not in the future, but now. Those coming into our educational system rely on participatory learning for information about virtually everything in their lives. Adults, too, turn first to the Internet and the "wisdom of crowds" and "smart mobs" to help them make decisions about which car to buy, which cell phone service to use, which restaurants to frequent, and even which form of heart surgery promises the best results with the least risk. Business and other professions turn more and more to collaborative learning forms.'* (Davidson & Goldberg 2009)

*'It's the learning communities that universities establish and nurture that remove them from the realm of a delivery service, or from being mere traffickers of information, to knowledge creators. (Brown 2001)*

Participatory learning is where the learner actively engages in the process of learning, as opposed to being taught. Linked closely with the notions of user-generated content, open education resources, collaborative learning and connectivity, participatory learning can support the development of a bottom-up ecosystem of resources and interactivity, both in terms of curriculum and the way student interact, share, contextualise and apply their learning, supporting as Brown and Adler note '...active, passion-based learning' (Brown & Adler 2008).

There is research evidence that suggests that mutual discovery and creation, group-based problem solving, and the collective determination and making of meaning produce better learning outcomes and understanding overall (Brown & Adler 2008; Bruffee 1999; Tapscott & Williams 2010). Brown and Adler (2008) cite a study by Richard J. Light, of the Harvard Graduate School of Education;

*'Light discovered that one of the strongest determinants of students' success in higher education . . . was their ability to form or participate in small study groups. Students who studied in groups, even only once a week, were more engaged in their studies, were better prepared for class, and learned significantly more than students who worked on their own.'* (Brown & Adler 2008; Light 2001)

Participatory learning is also closely aligned with the development and formation of communities of practice as discussed by Lave and Wenger (1991). Drawing on the wider notions of the participatory learning that learners bring with them, (including informal learning, work based learning and trans-disciplinary skills such as those that inform the Greenwich Graduate Initiative), web 2.0 technology embedded in a higher education learning and teaching approach is a powerful instrument to effect significant change in the way the institution perceives learning, the way it assesses achievement, the modes by which it engages in the social construction of knowledge and the way it supports learning amongst its community (Davidson & Goldberg 2009; McLoughlin & Lee 2007).

*'Learning is a remarkably social process. In truth, it occurs not as a response to teaching, but rather as a result of a social framework that fosters learning. To succeed in our struggle to build technology and new media to support learning, we must move far beyond the traditional view of teaching as delivery of information.'* (Brown 2001)

### 3.6 Open pedagogy

The concept of 'openness' in education has been allied with the use of new technologies, and the term 'open scholar' has come to include a wider array of functions, open data, open publishing, opening the boundaries between publishing and the 'real world' and open education and teaching. However, these also require a change to the way academia is managed, staff are hired and promoted and how the institution is evaluated (Borgman 2007; Pearce et al. 2011). Open pedagogy has been linked to a wide variety of instruments and models including Massive Online Open Courses (MOOCs), open access journals and repositories, open educational resources and courseware, open enrolment courses, open textbooks, creative commons licensed multimedia, and freeware software and platforms (Taylor & Mackintosh 2011). Anderson and Balsamo (2007) define the characteristics of open pedagogy in higher education as '...participatory, non-proprietary, collaborative, distributed, many-to many, multi-institutional, global' where there are hybrid approaches to space, boundary and role, which 'blur lines between academic and everyday social, creative and expressive

practices; crossing traditional generational and cultural boundaries' and media rich, using the modern suite of audio, video, interactive tools and expressions in a rich and sophisticated way. (Anderson & Balsamo 2007)

### 3.7 What could this look like in practice?

Taylor (2010) argues that the structure of knowledge has changed significantly in the last two decades. Modes of reading, writing and critical thinking have been changed through access to broadband internet, user generated content and platforms to share and create media. At the same time, the way we relate, both personally and professionally, has also changed through the same set of practices altering both our understanding and application of interactivity. Research and methods of inquiry have undergone equally radical changes with technology and analytics shifting data analysis, interpretation but also the way we aggregate and integrate data (Clark 1995; Greenhow, Robelia & Hughes 2009).

Some examples of what these new pedagogical approaches could look like in teaching and learning practice are listed below. They have arisen from the exemplars in the case studies and research projects in the literature but also from our consultation with the eCentre and the wider academic community. Some of them are informed by the JISC report 'Effective Practice in a Digital Age' (Knight 2009). It is by no means an exhaustive list, but at least indicative of some of the practices occurring currently in the sector.

- Studio classrooms (multi-disciplinary, multi-mode spaces)
- Flipped classrooms, where the lectures become rich multimedia consumed outside the institution and the lecture time is spent on social interaction and group work, led by the academic
- High quality content, open access and a new knowledge architecture (Brown 2001)
- Social interaction both on and off campus, between disciplines and with practitioners outside the academy
- Inter disciplinary and trans-disciplinary research and inquiry, problem based research supported by platforms that share findings, collaborate on problems and provide opportunities for application
- The development of graduate education that focuses on problems rather than disciplines. The roots of problems are almost inevitably found in the space between disciplines (Brown 2001; Nicolescu 1997)
- Peer-to-peer engagement through distributed learning
- Development of digital and social competencies through higher education study (blog usage, making artefacts, podcasting skills, collaboration tools etc.)
- The development of a connected community where all members are linked through social networks, learners develop and curate a digital identity and then engage in learning through interactivity and media rich tools.

## 4. Infrastructure and environment

*'We believe that a creative relationship to educational technology proceeds from the assumption that tools are made to be broken, misused, disassembled, reverse-engineered, hybridized and brushed against the grain. We must be willing to invest a certain amount of effort in the sometimes difficult process of engaging with the way technology functions, both at the level of hardware and of code.'*  
(Anderson & Balsamo 2007)



*'Thirty years from now the big university campuses will be relics. Universities won't survive. It's as large a change as when we first got the printed book. Do you realize that the cost of higher education has risen as fast as the cost of health care...such totally uncontrollable expenditures, without any visible improvement in either the content or the quality of education, means that the system is rapidly becoming untenable. Higher education is in deep crisis.'* (Drucker 1997)

In order for the modern university to facilitate participation, social interaction, networking and community building, space needs to be an integral consideration. The space to commune, to interact, to freely engage is critical. Both virtual and real, the space should encourage unpredictable activity and association (Palmer, Zajonc & Scribner 2010). Hemmi, Bayne and Land (2009) argue that the changes in infrastructure required by web 2.0 pedagogies that are often volatile, experimental and flexible, challenge university management to act quickly, address conflicts and tensions that arise between new and existing ways of teaching and research, and to '...alter relations between process and artefact, permit fragmentation over cohesion, exploration over exposition and the visual over the textual' (Hemmi, Bayne & Land 2009).

Whilst other iterations of technological change in higher education, such as the VLE, required institution-wide changes to infrastructure, licensing arrangements and firewalled systems, the shift towards open pedagogies and web 2.0 informed teaching and learning requires less formal infrastructure (as much of it web or cloud based) but a significant shift in the thinking about the way the information and processes are accessed and the way staff are trained and supported (Brown 2010; Pfeffer 2011). The ability of learners, through increased autonomy, to shape and maintain their own personal learning environments, where their networks, activities, achievements and knowledge are aggregated (through an e-portfolio, web presence or blog) places increasing pressure on university information architecture, as well as the responsibility of the university to provide the learners with the requisite skills (Berlanga, Peñalvo & Sloep 2010).

The development of personal learning spaces can also expose tensions between the learner's personal and private life, as well as putting the university in a position that challenges its role in terms of privacy, endorsement and support. There is a divide between the literature that argues for (or against) the usage of a specific platform or instrument and the literature that looks at the processes that are informed, facilitated or undertaken by the specific instruments. For example, Zhang, Flammer & Yang (2010) explore the specific applications of YouTube to higher education, providing how-to guides as well as pedagogical rationale underpinning the use of YouTube (amongst other non-video applications) whilst Lee, McLoughlin & Chan (2008) argue the constructs, practices and benefits of podcasting and vodcasting for learners engaging in higher and education without advocating specific platforms.

Siemens and Weller (2011) argue that any advocacy of specific social network systems poses a number of questions for the institution in terms of infrastructure and space;

- 'Does the promotion of a particular social media represent endorsement by the university?
- To what extent does promotion suggest technical support?
- Are universities responsible for activity with a chosen (social networking system)? For example, if a university promotes the use of a particular (social networking system) and subsequently another student bullies a student in that space, to what extent is this concern and responsibility of the university?
- Is the university or the social media platform responsible for privacy issues?
- Does the promotion of a particular (social networking system) make it obligatory? Will students be disadvantaged if they elect not to use it?' (Siemens & Weller 2011)

Foroughi (2011) argues that once an institution makes a decision to enact a new pedagogy based on technology, there is an extensive evaluation framework that needs to be implemented at a macro, mezzo and micro level focusing on outcomes, learner experiences, on-going curriculum development, academic experiences, the uptake and amount of infrastructure, the integration of the technology seamlessly into teaching, learning and assessment, the degree of training required and the motivation of staff to support and use the new technologies. Siemens and Weller (2011) add that the institution needs to encourage experimentation; a space where new ideas can be tested and trialled out safely, with the findings shared widely amongst peers and then rolled out more widely based on reliable and valid research. Further, this experimentation informs the wider academic community through pedagogical research, publications and research grants through organisations such as JISC.

Linking closely with the need for organisational wide change in response to the impacts of technology, infrastructure, learning spaces and evaluation practices representing significant capital investment by the university need to be fit for purpose in the digital age. What that actually means in terms of IT requirements, redesigned learning spaces and learning and quality systems is not as clear as the need for it to happen. There is extensive debate around these issues, both at a practice level and at a policy and strategic level. What is clear is that the customer of the organisation is changing, and their requirements on space and infrastructure is also changing. The 2011 ECAR report (Dahlstrom et al. 2011) into undergraduate students published by EDUCAUSE notes that the average student owns around twelve digital devices and may bring many of them to campus, with half of them Wi-Fi capable. A majority of students have accessed enrolment information, results and their VLE through a smartphone or a tablet. This places great stresses on the infrastructure of the university, but also points to a new learner cohort, familiar with technology, familiar with how they choose to use it and tooled up as they enter the campus.

## 5. The learner and the way they will experience learning

*'Today's digital kids think of information and communications technology (ICT) as something akin to oxygen: they expect it, it's what they breathe, and it's how they live. They use ICT to meet, play, date, and learn. It's an integral part of their social life; it's how they acknowledge each other and form their personal identities.'* (Brown 2001)

*'The born digital generation has a daunting learning agenda: they must acquire appreciation for the depths of disciplinary knowledge, but not get mired in the merely academic, so that they can forge connections across disciplinary divides in the service of creating new understandings and formulating new questions to pursue. While they might understand intuitively that innovation is a multidisciplinary creative endeavour, they also need to understand how knowledge is produced in the dialogue among disciplines, through the process of social negotiation, and in creative collaboration with peers and experts. In short, they must learn how to engage in conversations with those who do not hold the same cultural values or intellectual commitments'* (Anderson & Balsamo 2007)

### 5.1 Introduction

The learner of today is not the same as the learner in a pre-digital institution. The digital learner brings different literacies, languages and behaviours to higher education. To adapt to this kind of learner, teaching, learning and assessment strategies need to be re-evaluated, our epistemological approach has to be re-designed and the infrastructure supporting learners needs to be more agile and less 'siloed' and owned. It also requires a significant shift in the way curriculum is designed, learning outcomes assessed and the way research

both at graduate and post-doctoral level is conducted. Conole and Alevizou (2010) argue that the skills of digital learners are not universal nor consistent, as they have been acquired 'for purpose' as opposed to developing a toolkit of potentially useable skills, which requires the institution to both identify the skills gaps and rectify as required. Walker, Jameson and Ryan (2010) suggest that by building on these existing media and technology skills gained through 'participatory cultural activities' then learning can be enhanced and the areas where academics perceive student weakness (such as an inability to reflect) can be overcome.

There is some evidence that students themselves, even though they are perhaps 'digital natives' (Prensky 2001) or as David White from the University of Oxford suggests 'digital residents', resist the web 2.0-isation of higher education, preferring lectures, paper and a more traditional academic experience (Jackson et al. 2011; Lohnes & Kinzer 2007). Jump (2011) identifies a similar outcome arising from the modes of assessment that are used in higher education noting that learners '...still have to be able to convert these meanings (that they take from technology-based learning) into pedagogically recognisable texts, i.e., essays, projects, reports, etc., that make up their assessment tasks'.

O'Donnell and Sharp (2012) argue that the role of lecturer is not as different as it seems in the digital world, that students expect the lecturer and the lecture to be a fundamental part of modern education, noting '...that even though students expect technologies to be used in higher education, they realise that lecturers form the backbone of third level education, and while technologies can effectively be used to enhance students learning experience, the use of technologies in higher education will never replace the lecturers'. It could be argued that this is a fake dichotomy. It is not an either/or scenario. The university, the lecturers and the discipline knowledge are all part of the modern academy; it's just that they are joined with other conceptual platforms such as collaboration, context, inter/trans-disciplinarity and network formation.

Amongst users of social media, new skills such as collaboration, sharing, content production and inquiry have become 'normalised' and form part of the daily work and personal lives of learners. The processes arising from these skills often occur without consideration to geographic boundaries, gender, race or age. They are facilitated by virtual communications, immediate responses, agile access to information and a community of people willing to provide crowd sourced opinions, answers and support.

*'Young people are spending their time in a space which adults find difficult to supervise or understand. . . . Use of digital technology has been completely normalised by this generation and it is now fully integrated into their daily lives . . . almost all are now involved in creative production . . . they all use technology in a way that in the past would have labelled them 'geeks' (Green & Hannon 2007)*

Jenkins (2009) categorises these skills more widely, suggesting that modern learners possess a variety of skills that have emerged from their interaction with web 2.0 technologies, including (but not limited to) the skills of play (problem solving through experimentation), performance (discovery through the adoption of alternative identities), simulation (interpretation of models of real-world processes), appropriation (remix and reuse of media content in the form of 'mash-up'), multi-tasking (focus shifting required by the situation), distributed cognition (the use of tools to expand skills and thinking capacity), collective intelligence (the use and validation of pooled knowledge to solve problems), judgement (evaluation of the reliability and validity of information), trans media navigation, negotiation and networking (Jenkins 2009).

Critically, Jenkins (2009) argues that over 50% of today's learners make culture, whilst a further 33% share culture, noting '...a participatory culture is a culture with relatively low barriers to artistic expression and civic engagement, strong support for creating and sharing one's creations, and some type of informal mentorship whereby what is known by the most experienced is passed along to novices.' (Jenkins 2009). This links to the notion of a community of learning, where knowledge construction and feedback can be learner-led. The

model of collaborative pedagogy adopted by the Open University attempts to draw on these relationships, with many of their programmes ‘...moving beyond a curriculum focused on what is known to an emphasis on teaching how one comes to know’ and supported by the notion of a ‘conversational framework’ which utilises discursive and active conversations and an application to practice and learning by doing (Laurillard 2002).

*‘Across the globe students are able to use collective intelligence to create “the wisdom of crowds” (Surowiecki, 2003), connecting within rich and dynamic social environments, rather than studying in solitude through impersonal learning management systems designed by administrators’. (McLoughlin & Lee 2007)*

What is the role of the university in an environment of changed learners, seismic shifts in working patterns and practice and increasing competition from within and outside the established community? What is the imperative to actually do so? Tapscott and Williams (2010) argue that the learner of today is boycotting the pedagogy; ‘...for many of the smartest students, it’s fashionable to try to get an A without going to any lectures—meaning that the cream of the crop is beginning to boycott the basic model of pedagogy.’ (Tapscott & Williams 2010). Taylor (2010) makes the point the requirements of the modern learner are not best served by a Humboldtian style university where specialised faculty produce esoteric publications and special interest curriculum in ever narrower fields of learning. This structure neither rewards nor encourages inter-disciplinary studies or supports the development of trans-disciplinary skills. It does not prepare the learner for any level of practice and in fact can diminish their employability in areas that seek networked skills, connected learners and agile communicators. It requires a learning environment that has ‘plasticity’ where connections can be made in appropriate spaces, to appropriate depths and with a critical mass of volume, both inside the institution and with knowledge and research in the wider community (Moller, Robison & Huett 2012). Learner’s skills and their devices free them from the constraints of time and space, of missed lectures and constraining their interaction to their one scheduled tutorial each week. They are also free from the constraints that say that the learning from ‘Introduction to Economics’ is bounded by the time allocated to that course. Learning from courses last year can be linked explicitly or tacitly to learning in this year and between what they are doing right now, as hyperlinked documents, better searching, collaboration and sharing, identify and make connections between knowledges and encourage active learning (Williams & Chinn 2010).

Moore et al (2008) argues that a fundamental perspective shift must occur at all levels of the university in order to change the instruments required to adapt to the next generation learner. They offer a variety of key competencies required of modern higher education (including information literacy, student ownership of learning, problem-posing abilities), however two quite prescient ones bear discussing. Firstly, the needs to be shift in the way institutions view learners, changing from being seen as passive receivers of learning (the blank slate) to being seen as big-picture thinkers and active, critically-engaged ‘doers’. They go on to suggest that the critically engaged learner possesses skills (sometimes at a nascent level) that support problem solving, the appropriate use of technology and creative discovery.

*“The scandal of education is that every time you teach something, you deprive a [student] of the pleasure and benefit of discovery.” (Papert 1982)*

Secondly, they address the issues of skills transference. Arguing that higher education delivers discipline knowledge in a passive, hands-off, individualistic mode, which utilises teacher-centred learning and administrative driven processes as opposed to a ‘hands-on, minds-on’ approach that is student-centred, active that encourages experimentation and ‘authentic learning’ (Moore et al. 2008).

*‘Students need to integrate new information with the information they already have—to “construct” new knowledge structures and meaning.’ (Tapscott & Williams 2010)*

## 5.2 Mixing the personal and professional

The notion of personal and professional identity is a complex one in a networked world. Where is the line between group-work and socialisation? Madge et al (2009), point to resistance from students when social spaces like Facebook are ‘invaded’ by institutions which leads to what they refer to as the ‘creepy treehouse’ phenomenon ‘when authority is seen to try and invade a young person’s social space.’

Siemens and Weller (2011) note that;

*‘...(an) issue for higher education is that successful (social networking systems) seem to blend personal and professional life; they do not separate them out. Some users of Twitter try to have multiple accounts for instance, to differentiate personal and professional comments, but it is precisely the personal element in SNSs that gives them value and interest. If this is removed, the result is a fairly dry, bland set of communications that seems at odds with the forms of dialogue found in these spaces that mix humour, resource sharing, ideas, personal observations, professional updates and comments.’*

A study by Hemmi, Bayne and Land (2009) addressed this issue specifically, noting that the use of web 2.0 technologies in higher education can lead to a blurring between social interaction, educational interaction and personal lives of the learners. Although they found instances where it occurred, they did not believe that it impacted on the benefits of social networking and interaction in University-level programmes. In a different study Land and Bayne (2008) point to the issue of displacement, where the learners own spaces become intertwined with their learning space and the learner loses a place to contemplate and reflect on their learning. Alternately, Conole and Alevizou (2010) see an opportunity to use these personal spaces as instruments to individualised learning and allow the learner to take control of their own learning space.

## 5.3 Personalised learning

Much of this paper has focused on the role of the learner as part of a wider community, a member of a network or as part of a collaborative process of knowledge construction and application. Technology has not just enhanced the ability of people to collaborate but it has also provided opportunities for learners to personalise and customise their learning journeys. Personalised learning which has evolved from the ability of technology to produce on-demand and customisable, dynamic content has also been influenced by the user’s use of technology outside the academy. The provision of user-centred environments, content and opinion rich in media and produced and re-produced quickly, interactivity and programmes designed to suit the need of individual learners precisely underpins much of the practices around this type of learning (Sampson, Karagiannidis & Kinshuk 2010). Other writers support the notion of learner self-control and self-regulation over not just the content of learning but over the scaffolding of skills required to engage and understand that content (McLoughlin & Lee 2010), though it can be argued that the expression of individual choice is not privileged over their participation in a social network or their engagement in a wider community (Kiernan & Stoneham 2010).

The concurrent processes of social interactivity and learning provide learners with a platform to acquire the skills and attitudes that enhance lifelong learning, supported by a University open to future, present and past learners as members of its community. Engaging with this wealth of experience through social technology

promotes the development of active citizenship, and innovative and creative attitude to professional and personal practice and a consideration of the reputation and professional identity and image (Redecker et al. 2009). The development of a learners digital identity within the context of their higher education is a tripartite relationship between the development of social networks, the sharing of e-portfolios and the management of a personal learning space (Bauer 2009). This leads to a wider discussion about the role of the university in encouraging and supporting students to promote their activities, develop a personal brand (along with the requisite issues of over-sharing, narcissism, confession and personal aggrandisement) (Ross 2011) and/or manage their digital reputation through the use of platforms such as e-portfolios, wide-reaching professional networks such as LinkedIn and through curated aggregation of opinion, thought and exemplars using Twitter, blogs or Scoop-it.

## 6. Conclusions

The challenge for the modern university is a complex one. The industry of institutions competing for the same markets is diversifying and globalising. The customers of this industry have segmented and changed from the ones that consumed their services even ten years ago. Some of the infrastructure that universities invested in is not fit for the new purposes and uses being asked of it. Pedagogical strategy through to curriculum design is struggling to embrace the new skills of the learners, the changing requirements of work and the innovation and creativity that can arise from socially constructed knowledge, experiential learning, the widespread usage of technology and creativity and innovation that can arise from inter and trans disciplinary fields of study.

There is little doubt that the mantra of 'pedagogy before technology' represents a way of positioning the role of technology in higher education. But more importantly it suggests that technology is an instrument that can support student learning. However, it does not argue that existing pedagogies are necessarily the most appropriate to engage the modern learner in an interactive, collaborative and personalised learning process. The suitability of technology to higher education practice is not a question that needs to be answered. Societal norms, business practice, social interaction and knowledge acquisition and contextualisation have already changed because of technology. If an academic argues that a learner should fail an assignment because they cited Wikipedia, what pedagogical or ontological philosophy underpins that opinion? Some of the writers here argue that the learner is failed because the academic doesn't have the experiences of learning on-line themselves, nor have they acquired the skills of learning and teaching online. This represents a major challenge for the modern university.

The position of the university as being a three year experience beginning with registration and ending with graduation is under challenge. Learners bring with them devices, skills, practice and knowledge that can support their development through the university experience. They leave the university with those skills enhanced, developed, challenged, repurposed and ready for sharing. Yet, at the completion of the qualification, aside from an alumni process, the university rarely engages them in continuing to interact with new learners or with the networks they formed whilst studying. The ability of web 2.0 technologies and social media to facilitate the formation of these networks, develop and nurture connections within a community and maintain a current and relevant personal web presence for individuals is unquestioned and well evidenced. The challenge for the modern university is to build this type of connectivity into the practices and strategic direction of the institution. From new arrivals experiences, through to curriculum design, learning, teaching and assessment, social interaction in and out of the 'classroom', infrastructure strategy and learning spaces and post-graduation processes, the ability of the learner, the academic, the administration and management, the employer and the community to interact, engage and maintain connections is central to the ability to flourish in the new environment.

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