

Lit Review Summary

The literature review looked at a selection of papers and journal extracts, with the Internet in Higher Education being of significance in offering the most suitable research. Extracts from substantial texts sourced from JISC, Unesco or others were also reviewed. Criteria for selection was the year published, with nothing older than 2007 (by reason of the exponential growth in use of technology since then, see [Aims, Focus and Methods](#) for more), as well as an orientation towards research around use of internet and web 2.0 applications, or social media, as these were perceived as most relevant to gaining an overall picture of the future digital landscape for any university. Other learning technology studies, for example use of interactive whiteboards, second life or uses of learning management systems were not included as these were perceived as largely web 1.0 or increasingly less popular technologies (this is evident in the number of papers available, as well as some content of papers reviewed).

Themes most commonly found in the literature were often of relevance to metropolitan universities by virtue of the nature of the student body present in a metropolitan university, i.e. being diverse, with numerous other commitments and requirements. There were 16 most common themes, these were then divided into Strategy types and Learning and Teaching types, with Assumptions summarised to conclude. The top 6 themes were then analysed (compared and contrasted) further using primary data established from the other sections of this research.

The Sixteen themes:

- INSTITUTION SUPPORT
- SOCIETAL CHANGES
- ICT SUPPORT (Provision)
- ELEARNING SUPPORT (Provision)
- SKILLS AND TRAINING (All aspects, Students & Staff)
- COST (All aspects)
- DEPENDENCIES (Infrastructure & Systems)
- COMPLIANCE
- DIGITAL DIVIDE (Inc Device Divides)
- PEDAGOGY / LEARNING DESIGN
- STUDENT CENTRED LEARNING
- LEARNING QUALITY
- CONVENIENCE / WORK LIFE BALANCE
- SHARED RESOURCES (All aspects)
- ACCREDITATION
- ASSUMPTIONS (idealism)

Top themes:

- INSTITUTION SUPPORT
- SOCIETAL CHANGES
- PEDAGOGY / LEARNING DESIGN
- STUDENT CENTRED LEARNING
- LEARNING QUALITY
- CONVENIENCE / WORK LIFE BALANCE

Literature Review

While there has been an apparent and continuing explosion in technological advances in all areas of life (Manyika et al, 2013), it may be that this is not fully or even significantly reflected in university culture and practices (Brown, 2012). A wealth of research exists, emanating from the UK and beyond, in Europe, Australia and the USA, with significant amounts of time and other resources being invested into this field, and published both in educational as well as computer science journals. The research, while having an overarching field in common, is fragmented, and often outstripped by the pace of advances in technology itself - "extracting meaningful research findings...has been hampered by the speed of innovation, which often renders study results obsolete as new technologies replace old ones" (Altbach et al, 2009, p136). The approach to the literature review is to ascertain the landscape and territory in relation to use and uptake of technology in university learning and teaching, both formal and informal, by attempting to establish themes which commonly appear. Of particular interest is the focus in relation to metropolitan universities. Themes will be noted, collated and analysed for popularity and significance as influencers. **This forms part of the research as a whole.**

The literature review takes the form of discussion of the themes that most commonly appear. There were 16 main themes noted, these have been loosely grouped into two sections - 'Strategic' and 'Learning and Teaching', with Assumptions summarised to close. Overlap between themes often occurs, but overall this grouping attempts to connect some of the territory, which otherwise is often overwhelming and unwieldy, and difficult to establish any logic or clarity. Please also refer to the [Literature Analysis](#), which includes tables and diagrams appropriate to illustrate points made in this text, with relevant links. Below is a quicklinks list to aid navigation between sections.

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Assumptions summary

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Strategic

1. Societal Changes

(National or Regional Policy and Requirements, demographic behaviour changes)

The rapidly changing society, both in terms of the nature of the new knowledge economy with all that entails (Tate & Klein-Collins, 2012, and Levine, 2000 in Boys & Ford, 2008), as well as the new levels of institutional accountability for each student they are charged to educate (Oblinger, 2013), demand changes in practice and policy (Boys & Ford, 2008). Many of these changes involve uses of technology that if not always directly involving learning and teaching, do always impact learning and teaching (Guri-Rosenblit, in Altbach et al, 2009). What could be termed 'indirect driving and restraining forces' may ultimately have the greatest bearing on the uptake and uses of technology within learning and teaching settings. Institutional forces such as those of cost saving or cutting measures like staff reduction and resources 'consolidation', institutional 'negative equity', increased sector competition and fluctuating legal or national policy requirements all impact approaches to teaching practice and the importance of learning outcomes, perhaps most especially in the context of the metropolitan university. Technological 'disruption' and advancement, as aspects of the continual process of the digitisation of society, also contribute to the changing expectations of the university in relation to its place in that society. The territory is therefore complex, creating a 'Tower of Babel syndrome' (Guri-Rosenblit, 2009).

Diane Oblinger, in her Game Changers chapter 'IT as a Game Changer', discusses significant changes in society in relation to technology advancement affordances that in themselves may become (or already are) strong drivers towards utilisation of technology at all levels of the learning and teaching process. For example convenience of access, the 'catalytic role in collaboration', shared infrastructure and Open Learning. The 'tools that students use in their daily lives' are absent from the classroom (Kukulska-Hulme, 2012). Kukulska-Hulme discusses at length the changes in public perceptions and expectations in relation to 'accessing and acquiring knowledge' as a result of technology advances, and the consequent changes required in staff and higher education institutions in order to respond by providing more in the way of all modes of elearning, as well as continuous development of institutional ICT 'capacity', and individual staff ICT skills. The notion that 'external conditions' are significantly impacting on learning and teaching, perhaps with user generated content and online social environments especially relevant.

Brown (2012) puts it like this: "much of the literature in the field sees the effective integration of Web 2.0 in HE as prompting or requiring a paradigmatic shift (*Franklin & Van Harmelen 2007*). This shift has been characterized using the 'perfect storm' metaphor (*Brown & Adler 2008*), the integrally linked phenomena of emerging technology, societal change (stemming from and feeding into the emergence of Web 2.0), the coming-of-age of the digital generation, and the pedagogical changes that will help people build the knowledge and skills to effectively 'ride the wave' of those changes."

2. Institution Support

The infrastructure, approach and strategic 'mission' of an institution is of great relevance to its ability to embrace a digitally scalable and achievable policy and practice in its work. Only by doing this will teaching and learning practice 'on the ground' have a strong enough support to be adopted more universally by staff across all disciplines and faculties (Newton & Taylor, 2013). Thinking about Rogers Innovation Diffusion theory, we know that the 'late majority' and the 'laggards' will not take on new practice until all their needs for *trust* and *proof* are met, and institutional level requirements and support are perhaps the only thing that will achieve this.

Clifford Lynch in 'A Matter of Mission: Information Technology and the Future of Higher Education' ('The Tower and The Cloud', Katz, ed, 2008), writes on the duties of scholarship, namely the custodianship and

dissemination of knowledge (scholarship) set in the wider remit to disseminate that knowledge on a global scale, in order to attempt to meet the ever growing (and currently unmet) demands for access to higher education. The mission of an institution, while perhaps being global, is first being 'local', yet may still mean that to effectively 'disseminate' that knowledge, they need to offer a much more flexible and diverse course structure to their local populations (Cavanagh in 'The Postmodality Era: How "Online Learning" Is Becoming "Learning", Game Changers, 2013).

2.1 Strategic Policy

A variety of papers and texts make commentary on the importance of 'top down' and 'bottom up' influencing factors in relation to uptake of technology in learning and teaching. The UCISA Technology Enhanced Learning Survey (TELS) from 2012 rank 'Central University Senior management support' and 'School/Departmental Senior Management support' at 2 and 3 in the top 5 important influencing factors (after 'Availability of TEL Support staff' at number 1) in 'encouraging the development of TEL and processes that promote it'. It is not clear, however, what form this support should take, but TELS do go on to ask questions about strategy and policy documents (internal and external), and their perceived effectiveness in promoting technology enhanced learning. However, the drawback of surveys such as the TELS is that no indication is made as to what 'effectiveness' actually means, so the usefulness of statistics such as this in practical terms remains questionable.

Understanding "the intractable problem of getting faculty to take seriously their own professional development with regard to new technologies for teaching and learning" (Kukulska-Hulme, 2012) might be in some way explained by "... (the) resistance is (also) associated with academics driving institutional policies who may 'adopt pedagogies that actually structure, constrain and contain the somewhat anarchic and more radical potential of (*Web 2.0*) technologies' (Ravenscroft 2009, p.2). (*Institutions*) tend to opt for closed-platform Web 1.0 type technologies conducive to teacher-driven pedagogical approaches and not to pedagogies based on student contributions, and the networked and collective learning possibilities of Web 2.0" (Susan Brown, 2012). Brown also found evidence of top down and bottom up influencing factors both being required: "(t)here needs to be a bottom-up and top-down convergence of ideas among academics on the ground and those forging Teaching, Learning and Assessment strategies particularly in relation to aims", recognising "the fact that no academic context is hermetically sealed".

2.2 Faculty Adoption

Themes surrounding factors at play which influence faculty adoption appear frequently in many academic studies. This theme, whilst significantly concerned with learning and teaching also fundamentally operates at a more strategic level. Without institutional and senior faculty management level policy and strategic support, faculty wide change will likely not happen.

Franziska Zellweger Moser, in 'Faculty Adoption of Educational Technology' (2007), reports the need for faculty 'buy in' as essential in order that curriculum design and learning and teaching practices change. She demonstrates a 'Faculty Educational Technology Adoption Cycle', and states: "faculty support has been identified as a critical factor in the success of educational technology programs, (*but*) many people involved in such efforts underestimate the complexities of integrating technology into teaching." Intrinsic and extrinsic forces however, bring to bear a variety of pressures in any tutor, to achieve changes in teaching practice. Zellweger Moser talks about Early Adopters (Rogers 1995, 2003) and the importance of professional support being offered early in the cycle of technology adoption. If (faculty) professional support is offered too late in the cycle, this can result in mediocre quality of efforts, and can in turn create negative experiences which are passed on to other staff (Early Majority), resulting in lower rates of adoption further down (Late Majority, Laggards). Creating a cycle of positive and high quality experience is therefore very important to successful adoption.

Newton & Taylor (2013), talk about the importance of a "shared vision and energy that touches all parts of the organisation", and the need for staff to be given the time to 'upskill' and to integrate their work with technology

and curriculum (re)design support, "...institutional recognition, if this is the way the university wants to move, that all staff at some point will be freed up so that they can devote time and energy into developing the new skills..." There is also a need to create parity across an institution so that expectations are clear and aligned for all staff, therefore a requirement for change management in transition to digital learning and teaching.

That "higher education institutions are currently challenged to look for innovative ways to develop their faculty, particularly in light of new economic realities that put pressure on resources" remains a problem across the sector, and "...it has been instructive over the years to reflect on how we can engage faculty in critical assessment and adoption of new technology if they perceive that it will bring them no personal benefit or that they have no time" (Kukulska-Hulme, 2012). Though "the needs of students may be perceived as relatively remote from the needs of faculty", perhaps the increasing need for more convenient and flexible learning provision (Oblinger, 2013, ch3) will help to drive change forward.

3. ICT Support and Training Provision

Technical support and Elearning Support provision, in both training and perhaps 'helpdesk' formats are very significant influencers, and their presence or absence form key driving or restraining forces in uptake of technology in learning and teaching. How much of this is down to perception rather than reality remains unknown, as much of the information surrounding this is anecdotal or dependent on an individual's interpretation of support and training. For example, several questions were posed by TELS (2012) which list relevant 'support' type responses as choices in Likert scales. But it is not clear who is responding, what their knowledge and expertise is, or how they might interpret notions of support and training (i.e. to what level, in what, when, how etc).

Kukulska-Hulme (2012) cites the importance of faculty support by stating that in order to achieve teaching delivery change, one must instigate adequate professional development fully supported by faculty using collaborative teams, work based learning, show and tell and 'reverse mentoring' (the student is the teacher). However, she acknowledges the problems of instigating complex and costly professional development programmes, especially for "a public institution with limited funds [...] to find cost-effective yet engaging solutions to the intractable problem of getting faculty to take seriously their own professional development with regard to new technologies for teaching and learning".

Zellweger Moser tries to address this issue, stressing the importance of support "particularly in competence development and educational technology course design" (i.e pedagogical support, see later), and "the development of adequate expectations about faculty requirements and how much effort and competence are necessary to successfully incorporate educational technology [...] This includes .. the development of a sufficient educational technology infrastructure and a satisfactory framework for educational technology support". This indicates that Faculty adoption goes hand in hand with support and training. Taylor & Newton (2013) challenge the traditional approach of 'support hand holding', saying "...current practices which position one-to-one assistance and face-to-face training as principal strategies are no longer sustainable or effective in building university wide capability in the use of technologies for teaching", and instead suggest "...access to professional learning opportunities (is) provided flexibly, in different modes, making use of current technologies and recognising constraints of time and place...".

4. Elearning Support and Training Provision

Kukulska-Hulme makes a strong case for the importance of pedagogical and course design support and training to work closely with technology support, making a clear distinction between the two. Quoting Friel et al (2009), who "give evidence for the effectiveness of a "collaborative training team" approach whereby technology training is placed into a pedagogical context by means of pedagogical dialogue to complement technology skill attainment; their approach also involved IT representatives providing one-on-one faculty support between training sessions to allow for development of personal technology skills among faculty, and a hotline for immediate problem solving". This is the ideal then, but both costly and time consuming. Zellweger

Moser comments that “time commitment is the prerequisite for an involvement in competence development and an engagement in course (re-)design activities”. Zellweger Moser gives helpful evidence too, on the difference between IT support and (pedagogical) course design support, as well as funding issues when discussing funding sources for smaller and larger course (re) design projects. So, we see provision for support (IT and pedagogical) is closely aligned to faculty adoption and central mission strategy.

5. Motivation, Skills and Training

(The individual perspective, staff and student)

Staff motivation is widely *perceived* as one of the most significant driving or restraining forces for technology uptake in learning and teaching. Motivation can be a completely subjective force, dependent on sometimes false perceptions and assumptions as well as on more formal factors such as faculty support and professional feedback. Zellweger Moser (2007) uses Roger’s system of Innovation Adoption to outline this, and in one paragraph sums it up, “...if early adopters experience too many setbacks, their negative reporting may lead to skepticism among the early majority, who will be tentative in their adoption of technology. These conditions discourage quality course design, and negative experiences are likely... As a result of this process, early adopters and the early majority will abandon use of technology, and the late majority and laggards will not even start adopting it”. The idea that some noticeable *individual* advantage must be attained through the utilisation of a technology is also common – see Mclean et al (2008) in Kukulska-Hulme (2012), Taylor and Newton (2012), who ‘express a typical perspective on this issue: “... academic staff will perceive little need to participate and will spend their time where they derive most personal benefit”’. For example, if extra work or time or effort is involved, then the ‘what’s in it for me’ level is considerably diminished, to potentially make the use of the technology redundant, but conversely, if time and effort are saved (e.g. automated marking, plagiarism detection, ease of use etc), then use of technology will be embraced. Only innovators and some early adopters (Rogers, 1995, 2003) will put in time and effort to experiment with new technology regardless of cost or advantage to themselves.

Susan Browns paper, ‘Seeing Web 2.0 in context: A study of academic perceptions’ (2012), is notable here for the reported low rate of response to participate in that study. Of the 97 academics who responded to her questionnaire (out of an approximate total of 4250 across the University), 74 responses were analysed, the rest having given insufficient data for analysis. This, in itself, might be an indicator of motivation in relation to issues surrounding technology. Notwithstanding the low response rate, the study goes on to reveal some interesting feedback on perceptions and uses of Web 2.0, especially from the qualitative data gathered.

Student digital skills are sometimes overestimated, so while staff need consistent professional development to up-skill and reconstruct practice, students too may need support and even training. “In terms of technology use, ... there were students who reported that they were ‘alienated’, and ‘overwhelmed’, and that they ‘struggled’ and ‘felt lost’ by the technology. It was clear that students’ abilities ... in a technology enabled environment were sometimes overestimated, as some students reported difficulty navigating the approaches and technologies presented”, (Taylor & Newton (2013). Conversely, Kukulska-Hulme (2012) suggests ‘reverse mentoring’, i.e. students mentoring staff in skills and uses of technology, as part of faculty professional development initiatives.

6. Accreditation

While accreditation is also perceived as a strong driver of TEL adoption, it may not be so in reality. The literature only has sparse occurrences, though when they are present, they appear as strong evidence for formal accreditation being in place. The TEL survey (2012) has ‘Other forms of accredited training’ rating at 34% of how ‘technology enhanced tools’ are adopted and enabled, and with 77% of ‘Delivery of the PGCert programme for academic staff’, especially from Post 92 organisations, where it rises to 87%, pointing to strong evidence for how to enable technology adoption. Doubt persists however, as even though statistics here are persuasive, the questions themselves are ‘loaded’ (i.e. biased in relation to the researchers own view) and may not reflect actual reality of opinion or practice.

Another problem potentially related with formal accreditation is that of whom may be entitled to it. Many universities – perhaps especially metropolitan, both in the UK and globally make extensive use of ‘adjunct’ or ‘visiting’ lecturers, and as such, this section of staff are often not included in any entitlement (paid time allocation) to professional development programmes, including those involving formal accreditation. Whether accredited or not, “...adjunct faculty are not typically paid to attend professional development sessions and are not typically invited to such sessions” (Ulrich & Karvonen, 2001), suggesting as a solution “training can be offered through asynchronous online pedagogies and web conferencing tools can be used [...] allowing adjunct to participate without a required trip to campus.” This only addresses the problem to a partial extent, as time is not taken into account.

7. Compliance

(Accessibility, IPR, Institutional Quality Assurance etc)

Security of data, privacy, accessibility (equity of access), intellectual property and ethical issues are key concerns for legal compliance in higher education, all impacting on digital learning and teaching practice. The presence of these concerns was evident in a number of papers, with particular attention on privacy and intellectual property. “I’m very aware of the potential dangers of mobile devices in [health and social care] from the perspective of confidentiality and ethical issues. What kind of future is envisaged?” (Kukulska-Hulme, 2012) being one clear indication of these concerns. ‘Lateral surveillance’ was highlighted by Veletsianos & Kimmons (2012), colleague confidentiality by Meyer & McNeal (2011), and security of data by Altbach et al 2009. The ‘confidence of attribution’ in the web 2.0 ‘chain of knowledge’ was questioned by Gray et al, (2008) as well as questions surrounding quality assurance and authenticity of the custodianship of knowledge in digital archives (Lynch, and Katz and Gandel, 2008).

8. Dependencies

(Infrastructure and Systems)

Technology affords new ways of approaching the university business, and the issue of dependencies may pose significant challenge to institutional ‘business models’, both conceptually and at a practical level of actual service infrastructure. While the e-commerce business model has long practiced networked service provision, universities have different and varying needs, but “all can learn from the best practices of e-business” (Boys & Ford, 2008, p47). Inter-dependent digital resources, for example dependence on use of wifi and computers, learning management systems, digital libraries, emailing feedback, social group work, third party platforms for web 2.0 applications etc could mean that there is too much dependence on technologies for core aspects of the service being provided – learning and teaching – and for any advantages created, there might also be new problems to attend to. A common thread in some discussions is “what happens if the technology breaks down?” The ‘enormous cost of reliance on ICT’, in this case the reliance on electricity provision, maintenance and upgrades (Altbach et al, 2009, p127) means an increasing problem in assurance of reliable services.

9. Digital Divides

(Skills, technology devices and connectivity issues)

The digital divide has been with us for at least the past decade, and still poses problems in relation to TEL and other university ICT services. Considerations amongst all stakeholders now range from digital literacy and experience (Taylor & Newton, 2013), participation divides (Veletsianos & Kimmons, 2012, Meyer & McNeal, 2011), device profusion dilemma, access to technology including infrastructure and individual service provision (Altbach et al, 2009). It must be noted that several of the texts made no acknowledgement of the digital divide in terms of access or skills amongst students and appeared to have an idealised view of pervasive digital skills

amongst the student body (Oblinger, 2013), however this may indeed be the case in some nations (USA).

10. Cost

(Implementation aspects)

The financial cost to fully implement ICT at any institution is very significant. For teaching and learning, the LMS, digital repositories, student records, training and support all require funding as well as time to implement. Boys & Ford's eRevolution (JISC, 2008) covers many aspects of these issues, and ways forward, some of which are already redundant due to technological advances. Altbach et al's 2009 Unesco report also devotes attention to this (ch5 & 9), and notes the rising cost of funding higher education, the inequity between developed and developing nations and institutions, and the apparent inverse relationship to provision and need. This is certainly true of any metropolitan university currently in the grip of a funding crisis in the UK.

Learning & Teaching

11. Pedagogy & Learning Design

Learning design and suitable pedagogical approaches are highly significant (Zellweger Moser, 2007) as themes in research discussion and thinking, and it may be that some radically new approaches are needed (Siemens & Tittenburger, 2009, Oblinger, 2013). Taylor & Newton (2013) discuss a 'converged learning environment' with 'equivalency' for all modes of study, somewhat similar to Oblinger's notion of the 'post-course era' of personalised learning. Currently, it may be that "many applications of ICT represent more 'technologically clever ways of replicating traditional face-to-face education models" (Butcher, 2008, in Altbach et al, 2009 and Siemens & Tittenburger, 2009), and if this is the case, then the argument of allowing time for curriculum and learning (re)design integrated with the student experience (Taylor & Newton 2013), might be a key aspect of staff up-skilling in a useful and meaningful way.

(Häkkinen & Hämäläinen, 2012) notes differences between instructional design and pedagogical design for "emerging technology landscapes", and believes that "general guidelines for designing future learning environments cannot be (yet) drawn". They also make a significant observation that much learning design is based around current assessment methods, and these do not suit future learning environments. "We should move away from assessing operationalized, routine kinds of tasks and easily measurable knowledge and skills, and focus on assessing how students use technologies as thinking tools in order to search, produce, manage, analyze, and share knowledge as well as solve complex problems individually and collaboratively". The 'real challenge', according to Veletsianos & Kimmons (2012) is 'the emergent literacy of know how' relative to using technology to support learning.

12. Student Centred Learning

Student centred learning perhaps may lie at the heart of reasons for technology enhanced learning. As students are now not only a very diverse population, they are also often very digitally aware in their daily lives, (though not always, pointed out by Taylor & Newton (2013), and though different types of students (demographically, culturally) bring different digital skills, they are all digitally experienced in some way (Kukulska-Hulme, 2012).

Dziuban et al (2013) believe that "the locus of control has shifted from the instructor to the student", with collaborative self- initiated learning at the forefront of this shift. Oblinger believes the value of a course is not in

the 'product' but in the experience through interaction and encouragement of critical thinking and problem solving (Oblinger, 2013). Student initiated learning is on the increase (Dziuban et al, 2013) and Hämäläinen & Häkkinen (2012) believe current formal education does not support the doing of 'complex projects in a self initiated and inquiry way', making use of informal social networks, which might be a central feature of '21st century skills' (Hämäläinen & Häkkinen) of learning: "you will learn by reading a book or the manual. We will learn through interaction with each other and the Internet." (Hartman, Dziuban, & Brophy-Ellison, 2007, in Dziuban & Moskal, 2011).

13. Teaching & Learning Quality

If technology can show evidence that it improves learning quality, then many more academics might begin to feel it was important to make use of in their teaching. Many instances of the need for 'effectiveness' and 'improvement' were evident in the literature (Zellweger-Moser 2007, Kukulska-Hulme 2012, Hämäläinen & Häkkinen 2012, Taylor & Newton 2013, Brown 2011), and even as a secondary theme sitting alongside, for example, 'what's in it for me', it was still present strongly.

The problem with the idea of effectiveness is that it is a subjective notion, therefore difficult to quantify in any way apart from statistically with pass rate/attendance rate/evidence of student engagement in a class. Siemens & Tittenburger, (2009) raise exactly this, asking 'obvious' questions of what should be measured, "... is it time spent in the classroom ... functional test scores ... Is it about learning? Or understanding?" More research may need to be done as "teaching and research in the field of educational technology have yet to achieve required balance" (Siemens & Tittenburger). Dziuban & Moskal (2011) comprehensive evaluation of the effectiveness of TEL programmes showed that 'a course is a course is a course'; that course modality had no real relevance to the effectiveness of the learning.

14. Shared Resources

14.1 Institution and policy implications

Custodians of Knowledge

The stewardship and dissemination of the record of scholarship, as Lynch puts it (The Tower and The Cloud, p43-56, 2008), is undergoing rapid and continuing change due to the digitisation of knowledge, including the methods by which it is selected, saved, filed, stored and retrieved (Katz & Gandel, p172-178). From the very limited access of the ancient 'Scriptoria' through to the rarified atmosphere of Russell group libraries to the current ever expanding set of inter-related online data banks, often now owned by private companies (Google, Microsoft). All the implications of which throw the core function of custodians of scholarship into doubt. This in turn has implications for the knowledge we would seek to transfer and disseminate, formally and informally to students.

The universities core purpose then, in legacy terms, is to collect, preserve and disseminate our shared knowledge, acting as quality and trust bearers (custodians), ensuring that what is kept is safe, high quality and accurate. Over the centuries this purpose has not really changed, only the means by which it was done, and who might be doing it. Katz & Gandel argue that in the 4th 'Archivy' of the Digital Revolution, information (knowledge) is 'superabundant', dissemination and retrieval are instant, ('everything can be found'), but that digital media is 'ephemeral', and therefore impossible to authentically preserve in original form, as all digital watermarking mechanisms have proved so far to be inadequate. Trust as respected custodians is consequently in danger of being eroded. Gray et al (2008), in their valuable work on citation and attribution issues surrounding use of web 2.0 technologies 'attenuating the tradition of the 'great chain of knowledge' on which academic work rests' confirm this view, giving clear examples of how the new 'user generated' and interactive content dissemination technologies make an impossible task of accurate attribution. In turn this impacts the institution, and each individual academic, in terms of reputation and authorship. While new advantages are made possible by new technologies, other new disadvantages are also created.

14.2 Curriculum, Faculty, Teaching and Individual Implications

Open Educational Resources

The model of institutions sharing their resources digitally is not necessarily a new one, however, on the scale it is now being implemented by some universities certainly brings a new understanding to what is meant by shared learning resources, as not only library resources, but course curriculums, and even teaching materials are being shared across institutions (Oblinger, p43, 2013). This potentially brings a number of benefits including time saving for staff, equality and parity of study between institutions and courses, as well as significantly expanded choices, and the sheer volume of material available. There is the likely potential of also raising of standards, by virtue of ease of access to a more engaged and student centred learning experience. However, shared resources also raise a number of problematic issues on several levels. The advent and exponential growth of Open Educational Resources has potentially enormous implications for “those players involved in the university communications system, i.e. university presses, libraries, commercial scholarly publishers, scholarly societies” (Lynch, 2008). And while the advantages that may be obvious for research, or learning and teaching, of such open access materials, they may not be so obvious either at institutional level or to individuals within those settings, (Lynch, 2008).

The current trend towards the Massive Open Online Course is a popular example of course curriculum and materials being shared by often multiple institutions, but as quickly as MOOCs have risen in prominent popularity, they are now also attracting a number of more negative commentators, citing questions around accreditation and cost (Benke, p153 and Reshef, p197, Game Changers, 2013) and most of all the potential loss of quality in the study experience. “So much of the pedagogy is this presentational, talking-heads sort of thing. We’ve been telling ourselves for years we need to get away from that pedagogy, and now here it is slamming back at us again”, (Diana Laurillard, London Knowledge Lab, in Moocs, Cutting Through the Hype, 2013).

15. Convenience and Flexibility (Work/Life balance)

Two main issues were present in the literature concerning issues of convenience and work life balance in relation to staff, but there was ambivalence too in how these were interpreted by the research. “Despite their busy lives, these academics found sufficient value [...] to participate in extensive online discussions” (Meyer & McNeal, 2011), so the activity of social network participation with its perceived benefits of ‘self therapy’, ‘musing aloud’, and ‘the best aspects of peer to peer review’, was deemed “worthy of their time”. This contrasts with evidence that extensive use of ICT actually increases “work-life conflict” and the length of the working day, as “it becomes increasingly difficult to disengage oneself from work” (Heijstra & Rafnsdottir, 2010).

There was also a third issue surrounding flexible learning, and the convenience of access to learning materials and study tasks. Tate & Klein-Collins (2013) believe that the huge increase in ‘non-traditional’ learners means that flexibility is at the core of student expectations and needs. Cavanagh (2013) states that even the more traditional 18-24 age group increasingly require more flexibility too, choosing some online learning programmes partly for work or other commitments reasons, but also as a way to make time to engage more with on-campus non study activities. It would appear then, that any perceived advantage in flexibility and convenience is equally met by increased workload and time demands.

16. Assumptions

Various assumptions and myths surrounding the use of technology in study settings are present in the literature, these are summarised here:

- Ambivalent assumptions about work-life balance and convenience (Heijstra & Rafnsdottir, 2010)
- Time required to up-skill for using technology in T&L (Zellweger Moser, 2007, Kukulka-Hulme, 2012)
- Technology causes students low attendance (Brown, 2011)
- The ‘silver bullet’ of TEL (Brown, 2011, Guri-Rosenblit in Altbach et al, 2009)

- The significance of modes of learning (Dziuban & Moskal, 2011)
- Pedagogy readiness (Oblinger, 2013, Veletsianos & Kimmons, 2012)
- Generation 'gap' and social media (Kukulska-Hulme, 2012)
- General mystification of technology in education (Guri-Rosenblit, 2009 in Altbach et al, 2009, Brown, 2011)

"There's a huge amount of a priori thinking about it [technology]; it does this, therefore, it will work, therefore people will change their behaviors to work in this way." Interviewee response, (Brown, S, 2011), "... it contributed to low attendance ..." (Brown, S, 2011), "a Tower of Babel syndrome", the "actual effects versus the sweeping expectations", "there are more than 20 terms which describe the employment of technology in education" (Guri-Rosenblit, 2009, in Altbach et al, 2009).