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Staff Perceptions of Technology Enhanced Learning in Higher Education

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Abstract: This study looks at academics' perceptions of, and attitudes to, educational technologies in the context of the intrinsic and extrinsic barriers to adoption which confront them. Academic and support staff at a university in the south of England were surveyed, in part, to establish the reasons given by staff for non-engagement with Technology Enhanced Learning (TEL). What emerged was a mismatch between self-reported barriers and the reality of abilities demonstrated in other areas, for instance the personal use of social media. Our study findings were consistent with those such as, Reed (2014) and Bertolo, (2008), which have indicated that staff cited 'lack of time', 'lack of equipment' and a 'lack of skills' for the failure of educational technologies to act as the transformational tool that many educators believe them capable. Yet, those same staff, in other sections of the survey, indicated far greater technical competency than would be required for most TEL initiatives. While this dissonance resonates strongly with Ertmer's (1999) work on first- and second-order barriers to the adoption of new technology amongst practitioners, we also noted a more active resistance which appears to be linked to resentment of the perceived institutional imposition of new technology, combined with professional performance metrics which fail to reward innovation in learning and teaching. We also found evidence to support the idea of a Slow Revolution (Drucker, 1999) in technology enhanced learning, wherein technology is becoming embedded in teaching practice over a number of years, often long after the hype of its original introduction and expected overnight impact. In light of these findings we discuss ways in which institutions might embrace the Slow Revolution, while at the same time attempting to address the second order barriers which hinder progress.

Keywords: TEL, technology enhanced learning, pedagogy, attitudes

1. Introduction

Technology Enhanced Learning (TEL) has been defined by UCISA as: 'Any online facility or system that directly supports learning and teaching. This may include a formal VLE, an institutional intranet that has a learning and teaching component, a system that has been developed in house or a particular suite of specific individual tools' (Walker et al., 2014, p. 2).

This study looks at academic's perceptions of, and attitudes to, educational technologies in the context of the intrinsic and extrinsic barriers to adoption which confront them. Academic and support staff at a university in the south of England were surveyed, in part, to establish the reasons given by staff for non-engagement with Technology Enhanced Learning, what emerged was a mismatch between self-reported barriers and the reality of abilities demonstrated in other areas, for instance the personal use of social media.

Our results echo similar studies (e.g. Reed, 2014; Kregor et al., 2012) which have indicated that 'lack of time', 'lack of equipment' and a 'lack of skills' are the primary self-reported reasons for the failure of educational technologies as the transformational tool that many educators believe them capable. Yet, in response to questions about their use of technology in different contexts such as social media and smartphones etc. they demonstrate a far greater technical ability than would be required for most modern TEL applications. This inconsistency led us to look at the possibility of second-order barriers to adoption of TEL as described by Ertmer (1999), in which the belief systems of academics and their self-efficacy play a greater role in determining their behaviour than the reality of their capabilities or available equipment.

Another finding was the negative impact of institutional policy and procedures on a small but consequential number of academics, generating active hostility towards anything that would not feed directly into either better performance metrics or career prospects. We also found evidence to support the idea of a Slow Revolution (Drucker, 1999) in technology enhanced learning, wherein technology is becoming embedded in teaching practice over a number of years, often long after the hype of its original introduction and expected overnight impact.

In the discussion, we look at ways in which institutions might embrace the Slow Revolution, while at the same time attempting to address the second order barriers which hinder progress.

2. Survey results

322 staff took part in the survey with 176 of those being academic, from a possible total academic pool of 821. Unless stated the results discussed here will refer to purely the 176 academic staff. Due to rounding the totals may not always equal 100.

The gender split was 53%, male and 47% female, with 77% being employed on a full time basis, the balance being employed on either a part time or contract basis.

The respondents were fairly evenly spread across the institutions four faculties (26% Humanities, 14% Business, 33% engineering and 23% Healthcare) with just eight (5%) representing central departments.

82% own a smartphone with the balance owning another type of mobile device. 100 % used either a laptop or desktop PC in their work. 62% own/use a tablet and 28% an eBook reader.

2.1 VLE usage

(n= 174) 25% use it daily, 45% weekly, 16% monthly and 14% never use it. All modules are required to have a VLE presence, however, in some schools the faculty admin staff update the VLE which may account for the 14% of academics who have not engaged with it.

(n= 148) 74% say that they have been given guidelines as to how to populate their VLE modules while 23% say they have not. Relatively even between faculties with the exception of humanities who have 86% who say they have been provided with guidelines.

Question: How did you learn last piece of new software that you used? (n=147)

- Workshop 20%
- Self-Taught 79%
- Online tutorial 27%
- Friend /Colleague 32%

Question: (n=145). Scale: Strongly disagree | Disagree | Neutral | Agree | Strongly agree

- 57% consider themselves to be an experienced user of the virtual learning environment (21% Neutral)
- 54% will make it easier to teach course content (35% Neutral)
- Using VLE will increase my productivity (very even split: 8/22/43/20/7)
- 46% VLE will enhance my effectiveness in teaching (41% Neutral)
- 38% VLE is an up-to-date piece of software (42% Neutral)
- 49% VLE is well supported within the institution (33% Neutral)
- 46% I have confidence in VLE (36% Neutral)

Question: Top things done with VLE (n=141):

- Upload Lecture Slides 93%
- Upload other teaching material/documents 93%
- Post news/announcements 88%
- Upload module handbook 84%
- Add contact information 77%
- Use/set up assignments 77%

2.2 General

Social Media Usage: 75% use social Media (n=168)

- 14% use in L&T

- 87% use Facebook 11% professionally
- 57% use Twitter 44% professionally

Question: (n=124) 55% believe that the institution should provide clear guidelines for both academics and students engaging with social media (29% neutral)

Question: Top technologies being used with students (n=153)

- Online videos 50%
- Online questionnaires 37%
- Google (Docs/Google+) 29%
- Social Media 22%

Question: Top technologies would like to use in the future (n=142)

- Producing interactive resources 64%
- Lecture capture 51%
- Co-creating resources with students 51%
- Assessment and online marking 47%
- Producing animated resources 45%
- Mobile Technologies 43%
- Understanding copyright issues for online material 42%

Question: Are you interested in developing online or distance learning courses or modules? (n=161)

- I have already developed a course 12%
- I am planning to do so within the next year 13%
- I am Interested but do not know how 37%
- I am not interested 36%

Question: Main motivations for developing online or distance learning modules? (n=102)

- I would like to improve the student experience 79%
- I would like to improve efficiency 55%
- I would like to recruit more students 33%
- I have been told to 12%

Question: Do data (analytics) gathered from VLE or other TEL sources influence your practice? (n=158)

- I don't understand the question 20%
- I had not considered it 29%
- Not yet, but I would like to know more 34%
- Occasionally 18%
- Often 2%

Question: What (if any) do you see as the barriers to staff using digital technologies? (n=156)

- lack of time 89%
- lack of skills 41%
- lack of equipment: hardware/software 51%
- educational technology is not a priority 30%
- too risky 16%
- no significant barriers exist 2%

3. Discussion

It is apparent from this survey and others (e.g. Reed, 2014), that there are a number of very real and tangible extrinsic barriers to the wholesale adoption or integration of educational technology into academic practice. It is also clear however, that there is some dissonance in the rationalisations offered by academic staff for their non-engagement with TEL, which may point towards some intrinsic barriers.

Higher Education Institutions (HEIs) can often appear to be monoliths which lack the agility to respond to the rapidly changing world of technology, particularly in terms of physical equipment, infrastructure, the digital culture of contemporary students and, increasingly, that of academics. Academics complain about a, 'lack of support for new or alternative technologies' (survey respondent 1). Outdated, legacy, and inconsistent software across institutional computers can lead to incompatibilities which mean that something that works in an academic's office may fail to work in a lecture theatre in front of several hundred students. Even relatively simple TEL solutions are sometimes placed beyond the reach of the average academic because they do not have administrative rights to install software on their institutional PCs or laptops, and going via IT services, 'could take 2-3 weeks!' (survey respondent 2). While that may not appear to be a substantial barrier to institutional management, to a vacillating academic with competing priorities, it could easily be enough to tip the balance.

3.1 Value propositions of TEL

As the world of higher education increasingly embraces neoliberal value systems, the language and perceptions of academics are adjusting to this new paradigm of KPIs and a career path mapped against measurable outputs (e.g. Shore and Wright, 1999). As Bertolo points out TEL is often seen by academic staff as being asked to do more, 'but with no reward' (2008, p.1).

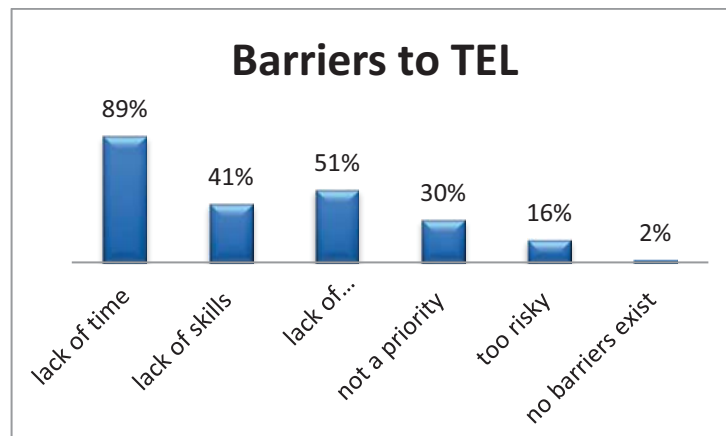


Figure 1: Barriers to TEL

When asked: 'What (if any) do you see as the barriers to staff using digital technologies?'

The response was (n=156):

Predictably and, in line with other surveys of this type, a lack of time (89%), lack of skills (41%) and lack of resources (51%) were cited. But interestingly, and against a backdrop of institutional, faculty and school strategies which espouse the virtues and importance of embedding TEL into teaching practice, 30% stated that educational technology was not a priority. In the free-text answers the relationship between effort and reward was made manifest:

'Little benefit esp vs cost'

'The "value per additional time spent" often looks too low'

'I do not see the motivation to spend more unaccountable time in an area which does not enhance career prospects'

'If the REF didn't exist and we didn't need to get research income I'd be a lot more positive about this sort of stuff'

'Time to learn & create with unfamiliar technology against other pressing priorities'

Comments such as these suggest both extrinsic barriers in terms of pressure to produce measurable outputs but also intrinsic barriers relating to the perceived difficulty of implementing TEL solutions. By couching pedagogic approaches in terms of a value proposition, academics are resting responsibility for TEL integration firmly in the hands of the institution, while also hinting at a reaction to, 'the kinds of institutional rules and requirements which diminish the importance of autonomy and motivation, and therefore academics' scope to innovate' (Vogel, 2010, p. 17). These strictures have been provocatively described as the 'dehumanisation of academics by institutional managers and their enforcers' (Hussein in Vogel, 2010, p. 18). Although this language may appear extreme, there is clearly a frustration amongst some academics who feel that they are not listened by 'those who try to convert us' (survey respondent 3), and that their concerns are dismissed by senior management following an 'evangelical path' (ibid). The imposition of 'frequent changes' (survey respondent 4) whose relevance can appear questionable may also serve to demotivate an unconvinced academic from engaging with TEL initiatives.

It is these feelings that feed into what Ertmer (1999; after Brickner, 1995; and Cuban, 1993), described as *second-order* barriers which are constituted by perceptions of 'teaching, beliefs about computers, established classroom practices and unwillingness to change' (1999). Although identified many years ago this barrier remains germane as, 'resistance seem[s] to be an inevitable outcome of even the smallest and least controversial of innovations' (Bryant, 2014). There are many factors which foster beliefs about technology and, beliefs about personal ability with technology. Ertmer has suggested that it is these personal beliefs of an academic which determine whether first-order barriers such as, unreliable equipment or a poor internet connection, will be a mild inconvenience or an unsurmountable obstacle (1999).

The dissonance between answers, which point to second-order barriers, can be seen when you look at the sub-set of the 42% (n=156) of academics who cite a lack of skills as a primary barrier for engagement with TEL. With 100% of that sub-set using computers in their daily lives; 85% owning a smartphone; 73% owning/using a tablet device; 100% using the institutional VLE and 87% using social media either professionally or personally. By any measure, people who utilise this array of technology on a daily basis can hardly be classified dilettantes. Another area that indicates disparities in attitudes rather than ability is the answer to a question about provision of guidance for using the institutional VLE, the same provision is made available to all staff via the intranet and staff development workshops, yet only 74% (n=148) acknowledge receiving it. Amongst all academic staff, 79% (n=147) said that they were self-taught in relation to the last piece of new software that they used; however, 85% of the sub-set who claim a skills deficit said that they were self-taught, demonstrating a much higher degree of technological competence and confidence than would be needed for most TEL implementations. This same sub-set of academics used a wider variety of technology than the average, and yet when it came to the VLE were far less enthusiastic about its ability to enhance productivity or learning. This could be an indication of resistance to institutional pressure to use the VLE, and/or their beliefs about academic autonomy, and warrants further investigation.

As we have seen in this survey, 89% ascribe non-engagement with TEL due to lack of time and 51% to a lack of resources; by placing the onus of responsibility on elements which reside outside of their locus of control these academics are removing any obligation or motivation on their part to change their behaviour. On the face of it this would seem reasonable enough; if institutions want to improve the levels to which TEL is embedded in teaching practice then they have to provide adequate resources, including more time, to academic staff. And, in fact that has been the response from institutions on numerous occasions over the years, with resources being poured into initiatives which provide equipment, training and time for staff development; yet, the impact of learning technologies on education remains a 'resolutely' disappointing one (e.g. Schneckenberg, 2009; Watson, 2001).

Recently the FELTAG (Further Education Learning Technologies Action Group) report (FELTAG, 2014) made over forty recommendations to the UK government intended to improve the adoption of TEL in FE Colleges. Although one of the stated aims was to, 'try to change behaviour rather than amass kit' (ibid), nearly all of the recommendations targeted the first-order barriers of skills training, resources and initiatives. None were directed explicitly at intrinsic second-order barriers. There is still an 'underlying assumption [...] that once adequate resources [are] obtained, integration [will] follow' (Ertmer, 1999, p.50), indeed FELTAG declare that as a result of their recommendations, 'changes are expected to happen quickly' (FELTAG, 2014). Yet, it has been shown that access to technologies and the provision of skills workshops do not, alone, lead to an increased take-up of learning technologies amongst academic staff (e.g. Kirkwood and Price, 2013; Bennett, 2010; Surry and

Land, 2000); and, there is evidence that 'even if every first-order barrier were removed teachers would not automatically use technology' (Ertmer, 1999, p.51).

Many studies have identified the link between teacher's belief systems and the integration of TEL into teaching practice and offered strategies to help overcome these (e.g. Ertmer, 1999, 2005; Cuban, 2001; Newman, 2002). Yet, the majority of institutional policies and TEL initiatives remain stubbornly focused on the tangibles of skills training and equipment. In order to see the greater impact on learning that TEL is capable of producing, a holistic approach is required in which tackling academics' personal beliefs is a central pillar: 'there can be no intuitional vision of technology use which exists separately from beliefs about learners, beliefs about what characterises meaningful learning, and beliefs about the role of the teacher within the vision' (Windschitl and Sahl, 2002, p. 202)

3.2 The 'slow revolution'

Laurillard et al (2008) said that 'education is on the brink of being transformed through learning technologies; however, it has been on that brink for some decades now'; possibly the expectation of academics 'seeing the light' and, en masse, suddenly changing deeply ingrained academic practice is unrealistic. However, while technology integration may not be happening with the pace or enthusiasm that learning technologists (and institutions) would like to see, there is change.

Peter Drucker (1999) talked of a 'slow revolution' in relation to the adoption of technology, where the technology itself may be around for some time before the emergence of an unforeseen imperative which drives take-up. He compared a technology based Information Revolution to the Industrial Revolution of the eighteenth and nineteenth centuries; the development of the steam engine (circa 1776) and the mechanisation that followed had an immense impact in every aspect of life, yet it took nearly a century for that impact to be fully realised. The reason for this he said is that, 'the Industrial Revolution in its first half century only mechanised the production of goods that had been in existence all along'; it took the development of the Railways in 1829, 'a product truly without precedent' to forever change the 'economy, society and politics' (ibid).

The parallels can clearly be seen in the development of educational technologies, with radio, television and then computers all being used in the first instance to 'replicate or support traditional activities' (Kirkwood and Price, 2013, p. 3). According to Drucker it is only when you move on from there to do something unique with the technology that the expected revolution can take place. There is an important distinction between 'doing things better' and 'doing better things' (ibid, p. 16).

Even now the majority of the tasks being carried out with the VLE, lecture capture and online learning mostly imitate and automate existing processes. There are very few cases where technology is being used in a 'truly' unprecedented way; although, some interesting possibilities are now beginning to materialise. For instance, researchers working with surgeons have developed a computer system in which the surgeons control on-screen activity via electrodes attached to their heads; this has been shown to train, otherwise inaccessible, parts of their brains, dramatically improving concentration and dexterity. Whether this or some other innovation proves to be educational technologies 'Railway moment' is unclear, what is evident however is as of this time that we have not yet reached that cusp.

What HEIs and learning technologists are faced with then, in the immediate future at least, is the more sedate process of assimilation, the 'slow revolution', in which technologies overcome initial resistance amongst practitioners to become embedded in practice over a period of time. This *was* the case with word-processors and PowerPoint, *is* the case with VLEs and, will almost certainly *be* the case with lecture capture. It is for example only a few years since the 'VLE is dead' debates (Clay et al., 2009; Weller, 2007), which with the benefit of hindsight seem to be absurd. The VLE *is* embedded in practice and therefore the challenge is no longer how to get academics using the VLE at all, but how to get academics to effectively use the VLE to impact on learning.

On the whole attitudes in this survey to the VLE were neutral to positive; the question which generated the most polemic response being: 'Using [the VLE] will increase my productivity' (n=145); with 30% disagreeing, 43% neutral and 27% agreeing. And so:

- 57% of academics consider themselves to be an experienced user of the virtual learning environment (21% Neutral)

- 54% believe the VLE will make it easier to teach course content (35% Neutral)
- 46% believe the VLE will enhance their effectiveness in teaching (41% Neutral)

This is encouraging; particularly in light of the fact that 86% of academics now regularly use the VLE and therefore these views could be deemed broadly representative.

Again, staff attitudes to further developing their engagement with TEL were promising; when asked, 'What other technologies might you like to know more about? The response was (n=142):

- Producing interactive resources 64%
- Lecture capture 51%
- Co-creating resources with students 51%
- Assessment and online marking 47%

When taken with the answer to a question about their motivation for producing digital resources in which 79% said it was to 'to improve the student experience' (n=102); it can be seen that there are a substantial proportion of academic staff who are enthusiastic about engaging with pedagogically, rather than administratively, driven uses of technology. These results would tend to support the findings of the FELTAG survey which concluded that 'practitioners are [becoming] more curious than fearful of digital technology' (2014). Even the prospect of venturing outside of the walled-garden with social media tools does not appear to phase most academics.

In addition to the intrinsic drivers of wanting to improve the student experience there are now extrinsic drivers for academics, both top-down from the institution who rank 'Meeting student expectations' (Walker et al., 2014, p. 12) as the second most important driver for developing TEL, behind 'Enhancing quality of learning and teaching in general' (ibid); and bottom-up from students demanding a more consistent and professional implementation of the VLE (e.g. <https://www.esu-online.org/?project=time-student-centred-learning>, 2010).

3.3 Lecture capture

Lecture capture is an area which learning technologists have been conditioned to expect resistance from staff as reported reactions ranged from, 'stringent opposition to the University's move toward online learning in general to lengthier exchanges about the pedagogical value of the videos, the amount of time the videos may require from them, and their impact on attendance (a common concern)' (Bergen, 2013). Yet, our survey response seems to indicate a growing acceptance of, and curiosity, regarding lecture capture.

This combined with student attitudes towards recorded lectures, which are widely reported in the literature to be overwhelmingly positive (e.g. Karakostas et al., 2010), would suggest that lecture capture becoming ubiquitous is a case of when, not if.

4. Conclusion

The ability of higher education institutions (HEIs) to shape the future pace and make-up of TEL integration should not be overstated; rapidly developing technologies might create a paradigm shift which render any long term planning moot. However, this generation of students are regularly being told that their education is preparing them for jobs which do not yet exist; HEIs might do well to consider an environment to facilitate educational technologies that do not yet exist. If institutions wait for technologies to become established before sanctioning academics use of them many, potentially valuable, educational opportunities will have been lost due to the condensed lifecycle of today's innovations, particularly those most applicable to youth culture.

The 'slow revolution' in educational technology and pedagogy is gradually influencing beliefs and practice, but opportunities are being missed because of the painfully slow process of integrating technologies into institutional systems. Technologies seem likely to evolve at a rate exponentially faster than today, and the two-to-five year gestation period of a typical TEL integration will mean that many innovations are obsolete before they have the opportunity to make an impact. There is a danger that the gap between technologies residing inside and outside of the institution will widen to such an extent as to damage the credibility and relevance of HEIs.

Another concern for HEIs is unconditionally buying into the latest ‘next big thing’, and expecting, MOOCS or iPads or the VLE to instantaneously and fundamentally transform the learning and teaching landscape. The endless cycle of ‘hype, hope and disappointment’ (Selwyn, 2011, p. 59) does little to convince the sceptical academic of the validity of TEL. The challenge for HEIs is therefore how to, sustainably and patiently foster the ‘slow revolution’, while enabling the innovators and early adopters to establish those technologies which will eventually shape the future. This could be in the form of providing stable, usable and pedagogically sound TEL solutions which scaffold academic engagement, giving them the confidence to experiment and develop their personal TEL pedagogies; while, concurrently embracing an ‘edgeless’ institutional structure allowing the innovators to seamlessly incorporate new technologies into their practice. As others have pointed out, any worthwhile strategy is likely to be multi-faceted, simultaneously developing the physical infrastructure, institutional culture and individual self-efficacy which comprise the first- and second-order barriers to the successful integration of educational technologies.

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