'Virtually mandatory': a survey of how discipline and institutional commitment shape university lecturers' perceptions of technology

Abstract

Although there have been many claims that technology might enhance university teaching, there are wide variations in how technology is actually used by lecturers. This paper presents a survey of 795 university lecturers' perceptions of the use of technology in their teaching, showing how their responses were patterned by institutional and subject differences. There were positive attitudes towards technology across institutions and subjects but also large variations between different technologies. Two groups of technology were identified – 'core' technologies such as powerpoint that were used frequently, even when lecturers felt that they were not having a positive impact on learning, and 'marginal' technologies such as blogs, that were used much less frequently and only where they fitted the pedagogic approach or context. Rather than there being 'leading' universities that were the highest users of all technologies, institutions tended to be heavier users of some technologies than others. Similarly, subjects could be associated with particular technologies rather than being consistent users of technology in general. The study suggests that university technology policy should reflect different disciplines and contexts rather than 'one size fits all' directives.

Introduction

For many years now, claims for the beneficial impact of technology on higher education have had a very high profile. According to the Higher Education Funding Council for England (HEFCE), 'technology has a fundamental part to play in higher education' (2009, p. 2) and many different rationales for adopting technology can be found in national and international educational policy. For example, it has been claimed that technology can reduce costs and increase flexibility thus realising the ideals of lifelong learning (McIntosh & Varoglu, 2005), allow personalisation for the individual learner (HEFCE 2005), or have a transformational effect on higher education (Mayes, Morrison, Mellar, Bullen, & Oliver, 2009). In response, governments and institutions have introduced initiatives which have raised expectations of the use of technology in education and led to huge investments to purchase and make use of new equipment and software, train staff and generally 'technologise' educational provision. However, these claims have been challenged, for example, Njenga and Fourie (2010) suggest that some of the claims made for technology are just myths and identify a 'technopositivist ideology' of compulsive enthusiasm for technology.

Given these claims and the investments in time and money that have been made in technology, it is not surprising that there has been a desire for detailed evaluations of the impact that technology has had on universities. However, while there have been a large number of small scale case studies of effective practice with educational technology that describe significant impacts on teaching or learning (e.g. Ferrell et al., 2007; JISC, 2004), there are fewer indications of the impact of technology on the sector as a whole and it is sometimes unclear whether these case studies do more than provide exceptions to more usual and less significant use of technology. As Hanson (2009) notes, such case studies often reflect the experience of enthusiasts and early adopters rather than the majority of academics.

Several empirical studies have noted that university lecturers often express generally positive attitudes towards technology (eg. Brill and Galloway (2007), Nicholson and Sanber (2007)) but despite their positive attitudes, there is wide variation in how lecturers use technology. For some, lecturers' use of technology is limited by a lack of equipment (see, for example, Bakioglu and Hacifazlioglu (2007)) while others have claimed that a lack of confidence with technology (Lynch, 2002), or a lack of pedagogical knowledge about how to use technology in teaching constrain use. Others suggest that technology has altered the role of the higher education lecturer away from that of 'knowledge gatekeeper' and that this requires university lecturers to move from a "teaching-centred" to "learning-centred" or "student-centred" view of learning (e.g. Hartman, Dziuban, & Brophy-Ellison, 2007). However, academics may not view this as a role that they wish to take or as one that matches their ideals of good teaching. Therefore, the imposition of technology and the new roles or ways of

teaching associated with this may be seen by an individual as a threat to their identity as a lecturer or university academic. In particular, the introduction of new technology may be seen as a potential threat to their authority (Bakioglu & Hacifazlioglu, 2007) or as leading to a sense of loss of control (McConnell, 2000).

While some studies have implied that a high level of agency is maintained by the individual, the context in which an individual works is also very important. The UCISA Survey of Technology Enhanced Learning for Higher Education in the UK (Browne et al., 2010) provides a helpful overview of the current uses of technology and the institutional context for these. For example, both the 2008 and 2010 surveys suggested that institutions considered that the most important reason to adopt new educational technology was for 'enhancing the quality of learning and teaching' with 'meeting student expectations' a close second. The UCISA survey and its predecessors demonstrate a gradual increase in the use of technology with some tools becoming widespread throughout the sector. But the UK Higher Education sector is diverse and, as might be expected, there are great differences between how individual institutions use technology. Some universities have been quicker to adopt new technologies or ways of teaching than others but according to data collected for HEFCE, 37% of UK higher and further education institutions offer at least one distance/online course (White, Warren, Faughnan, & Manton, 2010). In total over 1000 higher education courses are delivered online, though over half of UK online and distance courses are at postgraduate level.

While institutional policy can be seen as a key driver for the adoption of new technology, the departments within a University have an important role in how institutional policies are implemented. For Trowler, the department is very significant in the life and work of an academic and it can be seen as a separate entity that may function quite separately to other parts of an institution or even operate with antipathy towards other departments or towards management (Trowler, 2008, p. 158). This loyalty towards a department might be understood as a local manifestation of a wider subject loyalty. D'Andrea and Gosling comment that as academics move between institutions 'some remain relatively aloof from which ever institution they inhabit' (2005, p. 6) and Barnett, Parry and Coate (2004), note that institutional loyalty is secondary to loyalty to and academics' discipline. In addition, the content or structure of a particular discipline may affect the pedagogic approach that lecturers adopt to teach it. In relation to technology, Mishra and Koehler (2006) propose that there is a particular type of knowledge about what good teaching with technology in a particular subject is and refer to this as TPACK (Technology, Pedagogy and Content Knowledge). While Bates and Poole (2003) suggest that choices about how technology is used are "absolutely dependent" (p. 25) on beliefs about the nature of knowledge, of the particular discipline, and of learning.

Therefore, given the variation in how university lecturers use technology and how this might be affected by the contexts in which they work, there is a need to move beyond case studies of early adopters to explore mainstream use of technology and

to consider the role of institutional and subject-discipline influences on academics' use of technology.

Research methods

This study set out to explore university lecturers' perceptions about the use of technology in their undergraduate teaching and how these may be patterned by individual, institutional or subject differences.

This was addressed through an online survey of university lecturers from a range of subject disciplines, departments and institutions. While online surveys are cost-effective, flexible and anonymous, there is some evidence that they have lower response rates than postal surveys. This may not apply to all survey populations, though. Barrios et al. (2010) compared the response to web surveys and postal surveys from a population of PhD holders and concluded that in surveys of subjects with a high educational background the response rate to web questionnaires was significantly higher than to postal questions.

The survey needed to be sent to a cross-section of university lecturers. However, given this population, a full sampling frame would be impossible to obtain. While lists of teaching staff were available from institutional websites and other sources, it was considered that unsolicited emails may be automatically rejected due to the increasing use of aggressive spam-blocking tools (Fan & Yan, 2010) or be poorly received. Universities themselves hold lists of email addresses for staff, however, in order to use these, a 'gatekeeper' was approached and asked to distribute the survey. For this study, all English universities were approached and representatives from 27 institutions agreed to disseminate the survey.

Self-selection bias can be seen as a major limitation of online survey research (Wright, 2005) and Rea and Parker (2005) suggest that those who are not comfortable with web-based technology tend not to respond to online surveys. In this study, the focus of the survey was related to technology and any method that discouraged low users of technology from completing the questionnaire could affect the results by providing a biased sample. In addition, according to Barrios et al (2010) there is substantial evidence that the more importance that the population ascribes to the topic of the survey, the more they are likely to complete it. Therefore, the problem of discouraging low users of technology is compounded because high users of technology are more likely to consider this a salient topic and respond. Taking these considerations together, the sample is, therefore, likely to be skewed towards those university lecturers who are more sympathetic towards technology, although it did gather responses from those who made little use of technology and evidence of both negative and positive attitudes.

Despite the limitations described above, it was decided that an online survey provided the best compromise between gathering data from a large sample and avoiding a biased sample. It is important to note that as the sample was self-

selecting, it is likely to over-represent those who are most interested in technology or teaching and learning and this restricts the extent to which statistical analyses of the sample can be generalised to the complete population of university lecturers or to other employees of the sampled universities.

A draft version of the survey was created and piloted for in-depth evaluation from a group of university academics. This assisted the development of the survey questions and ensured that these were clear and could gather the data required effectively.

The survey resulted in 795 responses from teaching staff at 27 Higher Education Institutions. There was a great deal of variation in the response rate with over 20% replying at some institutions while others only received a few responses. However, calculating an overall response rate was not straightforward as it was difficult to know the exact overall size of the population. Very few institutional gatekeepers were able to tell how many lecturers they had distributed the survey to as bulk email systems are rarely able to provide a figure for the number of emails sent out. In addition, where this figure was known, it may have included academic staff who do not teach undergraduates or administrative staff who were not eligible to complete the survey. Overall, although the total response rate is unknown, the survey did gain a large number of responses and the data allows for comparison of demographic groups within the survey responses.

Position for Table 1 Demographic Characteristics of Sample (n=795)

Comparing the sample to national statistics for UK Higher Education Institutions provided by HEFCE via the online Higher Education Information Database for Institutions (HEIDI), this sample provides a good cross-section of the demographic groups represented in the Higher Education workforce. Overall, the balance of age, gender and subject ensures that this is a good sample to address the research questions.

Initially, univariate analysis of the data was conducted by generating frequency tables in order to identify any features of the reported uses of technology or beliefs held. In the analysis of data by institution, institutions with low responses were excluded from this aspect of the analysis. Where appropriate, descriptive statistics were calculated and compared to various demographic factors (for example, age, gender and subject-discipline) using the chi-squared statistic to test for their significance at both the 5% and 1% level. However, given the nature of the sample, these statistics were seen as indicative rather than generalisations to the wider population. The non-probability nature of the sample precluded more complex statistical analysis as the sample did not meet the assumptions required for such tests (Gorard, 2006).

The research approach followed the British Educational Research Association's Revised Ethical Guidelines for Educational Research and full ethical approval was

given through the researcher's institution's ethical approval procedures. In particular, issues of informed consent, data protection, confidentiality and misrepresentation were considered. Participation in the research was entirely voluntary.

Results

University lecturers reported widespread use of technology with 87% of respondents reporting that they used ICT in most of their teaching and 96% claiming that they used ICT to prepare for most of their teaching. There was no statistically significant variation in these results according to the demographic background of participants, the subject they taught or the institution where they worked.

The high levels of reported use were matched by participants' very positive attitudes towards technology with 97% agreeing that appropriately used technology could enhance teaching and learning in their subject. Again, there were no statistically significant differences in the strength of response according to gender, age, subject taught or institution.

While lecturers reported high levels of confidence in the use of technology in their subject (87% agreed they were confident and 38% strongly agreed), this did vary according to gender: 44% of males strongly agreed compared to 33% of females ($\chi 2$ =8.991, df=1, p<.01). There was also a relationship between confidence and subject taught ($\chi 2$ =16.908, df=5, p<.01) with lecturers in science, technology, engineering and mathematics subjects most confident and those in medicine, dentistry and health the least. (It is worth noting that there was also a relationship between gender and subject taught: 68% of medicine, dentistry and health respondents were female and 64% of lecturers in science, technology, engineering and mathematics were male). There was also a relationship between confidence and institution ($\chi 2$ =15.689, df=8, p<.05) with academics at one university more than twice as likely to strongly agree than those at another.

The survey also investigated lecturers' perceptions of any potential 'barriers' to using technology in teaching. As Table 2 shows, respondents were most likely to consider 'lack of time' to be a barrier to their use of technology. Both 'availability of resources' and 'access to technical support' were related to institution. Agreement that the availability of resources were a barrier ranged from 10% at one institution to 65% at another ($\chi 2$ = 47.176, df=8, p<.01). Perception of access to technical support as a barrier ($\chi 2$ = 25.381, df=8, p<.01) ranged from 19% to 57% (at the same institutions as for 'availability of resources').

Position for Table 2: Barriers to the use of technology in teaching

These issues were developed further in response to an open question about factors that influence decisions to use technology where 152 respondents mentioned time as a factor and identified three different aspects to this. The first was 'time to learn' (45) - these respondents felt that they did not have sufficient time to learn about what

new technologies exist or how to use them. The second was ‘time to prepare’ materials to use (44) and the third was ‘time to use’ technology once it was prepared (14). However for a few individuals, pressures on their time had the opposite effect and encouraged them to use more technology, for example, where restrictions on face-to-face teaching time led to content being delivered online or where there were opportunities to save time by creating resources that could be re-used.

Access or availability of resources was also frequently mentioned and featured in 91 responses. As this quote shows, access can vary within universities as well as between them.

There are some lecture theatres and teaching spaces that are better equipped than other with appropriate technology. Often I am timetabled in a room that doesn't give many opportunities to use technology in the right way. (#684, Female, 30 - 39, Subject not provided, Uni G)

However, availability is not sufficient. 33 respondents spoke of the need for the technology to be reliable too. As a result, some respondents described how they looked for ways to avoid the perceived failings of their institution’s technology.

I try to use those [technologies] outside of the organisation - quality and reliability are higher. (#311, Male, 50 - 59, Mathematical and Computer Sciences, Uni O)

Specific technologies

However, beneath these statistics about technology in general was wide variation in the popularity of specific technologies (see Chart 1) and attitudes towards them.

Position for Chart 1: Percentage of teachers using specific technologies frequently

From the responses, there appears to be two broad groups of technologies. Slideshow presentation software (eg. powerpoint) and Virtual Learning Environments (VLEs) could be described as ‘core’ technologies. They are both widely used across all institutions and subject areas although the frequency of use in each of these varies. The use of the other technologies could be described as ‘marginal’ – they are widely used in some specific situations (maybe related to institution or subject) but are not widespread and when they are used this is often infrequent.

Common to all of the technologies was a statistically significant relationship between reported use and a lecturers’ general confidence with technology and no apparent differences due to gender. However, there were a number of differences between technologies at individual, subject and institution level.

Core technologies

Microsoft Powerpoint has become a feature of many university lectures and almost all respondents made some use of slideshow presentations, eg. powerpoint, in their teaching with 77% of lecturers using it frequently and only 3% of respondents claiming never to use powerpoint. (The question used the term ‘slideshow presentations’ rather than just ‘powerpoint’ in acknowledgement of the use of other similar software by other software companies, for example, Apple Keynote, however, in this section, ‘powerpoint’ will be used to refer to this and other slideshow tools.)

There was a highly significant relationship between the subject that a lecturer taught and their use of powerpoint ($\chi 2 = 53.125$, df=5, $p<.01$). For example, less than half of those teaching Design and Arts used powerpoint frequently compared with 86% of lecturers working in Education. Given the nature of the presentation tool, as might be expected, there was a relationship between the frequency that a lecturer taught large group lectures and their use of powerpoint ($\chi 2 =22.568$, df=2, $p<.01$) and, conversely, those who taught more practical workshop based sessions were less likely to use powerpoint ($\chi 2 =9.248$, df=2, $p<.05$).

Although there were no significant differences in the use of powerpoint due to the institution where a lecturer worked, other aspects of their working context were important. There was a significant relationship between the use of powerpoint and perceptions of both students’ expectations ($\chi 2 =18.048$, df=1, $p<.01$) and colleagues’ expectations of a lecturer to use ICT ($\chi 2 =9.791$, df=1, $p<.01$) with, in both cases, higher expectations related to increased likelihood of using powerpoint.

For Virtual Learning Environments (VLEs), there were no significant differences between VLE use in different subjects, but institution was highly significant ($\chi 2 = 41.074$, df=8, $p<.01$) with the percentage of lecturers making frequent use of a VLE ranging from less than 24% in one university to almost 80% in another.

Unsurprisingly, there was a very strong relationship between whether lecturers perceived each technology to have a positive impact on their teaching and their reported frequency of use. For example, 84% of those who thought powerpoint had a positive impact on their teaching reported that they used it frequently compared to 44% of those who did not agree that it had a positive impact ($\chi 2 = 79.867$, df=1, $p<.01$; Spearman’s correlation = 0.403, $p<.01$). Similarly for VLEs, 75% of those who agreed that VLEs had a positive impact on their teaching used the VLE frequently compared to 21% of those who did not agree ($\chi 2 = 155.7$, df=1, $p<.01$; Spearman’s correlation = 0.488, $p<.01$).

Some respondents provided a more detailed explanation as to why they thought particular technology had a positive or negative impact on their teaching. In response to the open questions, 45 participants identified particular benefits of powerpoint while 18 expressed a negative opinion of this type of software. Some of these were particularly strong:

My experience and feedback from students is that act of watching powerpoint presentations produces an unthinking passivity that militates against discussion, engagement and active critical thought. (#723, Female, Age not provided, Social studies, Uni G)

For both powerpoint and VLEs, whatever the reasons for their views, there were a number of lecturers who used the technology frequently but did not think it had a positive impact on their teaching and therefore must have used it for reasons other than enhancing their teaching.

'Marginal' technologies

As shown above, reported use of the other 'marginal' technologies was low. This group included common 'Web 2.0' technologies such as podcasts and blogs that have a high profile in education literature, are widely supported in universities but appear to have a low uptake amongst academics.

For each of these technologies, apart from e-portfolios, there was a significant relationship between the reported use of the technology and the respondent's institution. For example, lecturers at University A were more than 4 times as likely to use podcasts as those at University M ($\chi 2 = 30.187$, df=8, $p<.01$).

Reported use of some technologies was also related to the subject being taught and how the teaching was organised. There were significant relationships between the use of blogging and the subject taught ($\chi 2 = 21.879$, df=6, $p<.01$). Blogs were most popular in design and creative arts and least popular in administrative, business and social studies. In addition, the more lecturers taught large group lectures, the less likely they were to use blogging ($\chi 2 = 6.982$, df=2, $p<.05$) while the more they taught small group seminars, the more likely they were to use blogging ($\chi 2 = 12.612$, df=2, $p<.01$).

There was also a significant relationship between the use of e-portfolios and the subject being taught ($\chi 2 = 23.109$, df=6, $p<.01$) with e-portfolios being most popular in design and arts subjects and in medicine, dentistry and health but least popular in humanities and language-based subjects. Lecturers were more likely to use e-portfolios, the more often they taught small groups ($\chi 2 = 18.468$, df=2, $p<.01$) or practical workshops ($\chi 2 = 8.570$, df=2, $p<.05$) and less likely to use e-portfolios, the more often they taught large group lectures ($\chi 2 = 10.569$, df=2, $p<.01$).

The subject taught was also related to the use of wikis ($\chi 2 = 20.574$, df=6, $p<.01$) with lecturers in design and arts being most likely to use wikis and those in administrative, business and social studies being least likely to use a wiki.

For the 'marginal' technologies, there was a different pattern of responses regarding perceptions of impact from the 'core' technologies. Across all six technologies, there was a high proportion of 'neutral' responses and, perhaps unsurprisingly, those who

used each technology were mostly positive about its impact on their teaching while most of those who did not use the technology responded ‘don’t know’ to questions about its impact.

However, unlike for powerpoint and VLEs, this group of technologies did not have many lecturers using the technology despite having doubts over its impact on their teaching. While powerpoint was used frequently by 44% of lecturers who did not think it had a positive impact on their teaching, none of this group had more than 2% of those who thought it did not have a positive impact using it frequently. It is possible that perceptions of impact on teaching may have been a greater factor in decisions about using these technologies than it was for the ‘core’ technologies.

At institutional level, different institutions were associated with different technologies but there were no ‘leading’ universities that were the highest users of all technologies. For example, while University M was the biggest user of powerpoint and e-portfolios, it was the lowest user of podcasts. Conversely, Universities B and F both appear several times in the list of the lowest three users (but not in every category) and never in the highest three users.

Position for Table 3: Highest and lowest institutional users of specific technologies

Influences

The survey used a range of open and closed questions to identify different factors that might influence participants’ perceptions of technology. One factor was the expectations of colleagues and students: 76% of respondents thought that their undergraduate students expected them to use technology in their teaching and 70% thought that their colleagues expected them to use technology in their teaching. Both of these were significantly related to a lecturers’ reported use of ICT.

Comments about the expectations of students, university managers and wider society were often phrased fairly negatively and sometimes suggested that respondents felt a lack of agency over their teaching methods. There were 39 responses that mentioned the influence of university structures or management and the influence of these could work to promote or constrain use of technology.

It is virtually mandatory. We do not have a choice whether to use technology or not. It is imposed by the technophiles. (#401, Female, Age not provided, Subject not provided, Uni V)

There are also other sources of expectation. Five comments suggested that a wider sense of expectation influenced them.

It seems to be the fashion (#173, Male, 60+, Business & Administrative studies, Uni J)

Expectations from students, colleagues, managers, or prospective employers provide one possible explanation for why some technologies are used despite the user believing that they might have a negative impact on student learning. The quotes suggest that this expectation may take the form of an explicit requirement ('we do not have a choice') or an implicit assumption ('the fashion').

Other factors that influence lecturers' use of technology and attitudes towards it included the design of the technology (75 responses) and particularly its ease of use. Teaching context was important in 37 responses in terms of both group size and location and 27 responses referred to the respondents' personal enthusiasm for technology.

A number of respondents discussed their use of technology in terms of how or whether it might improve teaching and learning for their students. Within this, there were three types of response: some discussed whether technology would enhance learning (or not) in general terms, some discussed the match between technology and their subject's specific learning intentions, while a third group of comments were phrased in terms of decisions about teaching.

As the next quotes show, lecturers set different thresholds for decisions about whether or not to use technology: some will use technology only when it makes a significant impact on teaching or learning while others (more rarely) consider if it will benefit any of their students.

My decision is made on whether the learning process will be significantly improved by using technology in my teaching. (#118, Female, 60+, Education, Uni F)

If the technology seems likely to benefit a majority of students, and if it is affordable, easy to use, does not require significantly greater time to use it, then I'll use it. (#544, Male, 30 - 39, Historical and philosophical studies, Uni Y)

I believe it is important to experiment with them to see if they enhance the learning experience of ANY students and my final decision is not based necessarily on enhancement for ALL students. (#754, Male, 50 - 59, Subject not provided, Uni G)

Whether or not technology would enhance student learning was felt to be related to the subject being taught or the particular intended outcomes of a teaching session and 91 responses referred to these. Some respondents taught subjects which they felt demanded particular uses of technology or limited their use of technology.

Discussion

The survey data suggests that the majority of university lecturers surveyed made frequent use of technology and held generally positive attitudes towards it. But it also shows that care needs to be taken not to consider 'technology' as a single entity. In fact, an individual is likely to hold very different opinions about different types of technology and exploring attitudes towards specific technologies is more productive

than investigating general ‘technology’ attitudes. Although 87% of the university lecturers responding said that they used ICT in most of their teaching, this does not mean that they use a broad range of technologies as many may use only powerpoint presentations frequently. It is also worth noting that the statistics given here provide the reported use of particular technologies and Kopcha (2006) suggests that lecturers over-report their use of technology. Therefore, the relatively low reported use of many of these technologies may reflect an even lower level of actual use.

The survey identified two groups of technology. The ‘core technologies’ group consisted of powerpoint (or similar slideshow presentation software) and virtual learning environments. These were widely used by the sample across all institutions and subjects and although the frequency of use of each technology was correlated with the lecturer’s perception of the impact of that technology, there were exceptions. Some of those using these technologies frequently did not consider them to have a positive effect on learning. It appears that for, at least, some of this minority, institutional rules or expectations require them to use technology in ways with which they are not comfortable.

The second group of ‘marginal technologies’ were less frequently used and included e-assessment, blogs, podcasts, e-portfolios, wikis and social bookmarking. While these are mainly newer technologies and may still be finding their niche in university teaching, age is not the defining factor between the two groups. In fact, e-assessment tools have a much longer history in university teaching than VLEs. These technologies were much less likely to be mandated by institutions or departments and, as a result, the reported use of these was more likely to reflect the individual’s attitude towards them.

Many lecturers present their decision to use or not use technology in terms of a decision about whether or not the particular technology will enhance learning. But, as discussed above, this seems less true for the most commonly used technologies. In addition, lecturers understood different things by ‘enhance’ and set different thresholds for the amount of positive impact that would make it worthwhile changing their practice.

At an individual level, lecturers reacted to new technologies either by directly evaluating it (by experimentation or through research) or by weighing up the relative benefits against any costs. The strongest element to ‘weigh’ appeared to be ‘time’. Lecturers considering adopting a new technology have to consider finding the time to learn about new technologies and how to use them, invest time in preparing materials to make use of the technology and then find time to use them with students. But lecturers are also aware of the context in which they work including the size and characteristics of particular teaching groups, the ease of use, access and reliability of resources, their own personal confidence, skills and enthusiasm for technology.

At institutional level, the survey has shown that different universities are associated with different technologies. Except for powerpoint (which is used in most if not all institutions), for each technology it is possible to find large differences in frequency of use between universities. But there are no ‘leading’ universities that are ahead of the others in frequency of use of all technologies. Institutions are likely to provide resources (eg. equipment, training) and policy directives for a small number of particular technologies and the choice of which ones varies between universities. Managerial policy directives or expectations were frequently raised by respondents and it is clear that mandates to use technology are effective in forcing some lecturers to use technology though it is far less clear that the intended benefits that presumably underlie these directives are achieved. In fact, the negative reactions to such managerial policies are apparent.

At a subject level, it was clear that many lecturers claimed that their subject and indeed, the particular content or intended outcomes of the topic they are teaching at the time, were a major influence on whether or not they use technology. But the survey did not find that there were some ‘technology-friendly’ subjects and some ‘anti-technology’ subjects. Rather, that for specific technologies, the subject being taught was closely related to the likelihood of that technology being used. For example, powerpoint was used widely but there were notable differences between subjects. This may reflect different preferred pedagogic approaches found in particular subjects. There was also a positive relationship between frequent use of powerpoint and the frequency of teaching through large group lectures and it may be the case that those subjects that prefer large lectures find powerpoint useful while those who teach mostly practical workshops have less use for it. In contrast, the reported use of blogging, e-portfolios and wikis showed the opposite pattern of use to that of powerpoint. In fact, lecturers in design and arts subjects were the least likely to use powerpoint but the most likely to use blogs, e-portfolios or wikis. Finally, these subject differences did not apply to all technologies – there were no significant differences for VLEs, e-assessment, podcasts or social bookmarking.

Conclusions

Trowler (2008) describes universities in terms of multiple cultural configurations. In terms of the technologies we are concerned with here, individual lecturers operate within department and institutional cultures that may demand or value certain practices and at the same time they have beliefs and expectations relating to their subject discipline (or specialism) and their own personal history with technology or understanding of learning and teaching. Lecturers make sense of these, possibly conflicting, influences when they decide how they are going to teach and these different cultures need to be accounted for more commonly in studies of the use of technology in universities.

The survey raises questions about the influence of the institution on how technology is used. While university policy can mandate the use of technology (or particular

technologies) this may be counter-productive if it leads to lecturers using technology in ways that they believe are not improving their teaching and can foster negative reactions. University technology policy should therefore pay attention to disciplinary differences and contexts rather than ‘one size fits all’ directives.

It also raises a number of questions for further investigation including whether these discipline and institutional commitments shape students’ perceptions in similar or different ways. Also, further studies should investigate exactly how the most popular technologies are used including how particular features of a VLE are perceived.

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Charts and Tables

Table 1 Demographic Characteristics of Sample (n=795)

		n	%
Gender	Male	335	47%
	Female	381	53%
Age	Under 30 years old	23	3%
	30 - 39	145	24%
	40 - 49	235	33%
	50 - 59	255	36%
	60 and over	56	8%
Subject Group	Administrative, business & social studies	169	24%
	Design and Arts	84	12%
	Education	89	13%
	Humanities and language based studies	96	14%
	Medicine, dentistry and health	130	18%
	Science, Technology, Engineering and Mathematics	137	19%

Table 2: Barriers to the use of technology in teaching

Barrier	Agree or Strongly Agree that this is a barrier
Lack of time	65% (474)
Lack of training	33% (239)
Availability of resources	32% (237)
Access to technical support	31% (227)

Chart 1: Percentage of teachers using specific technologies frequently

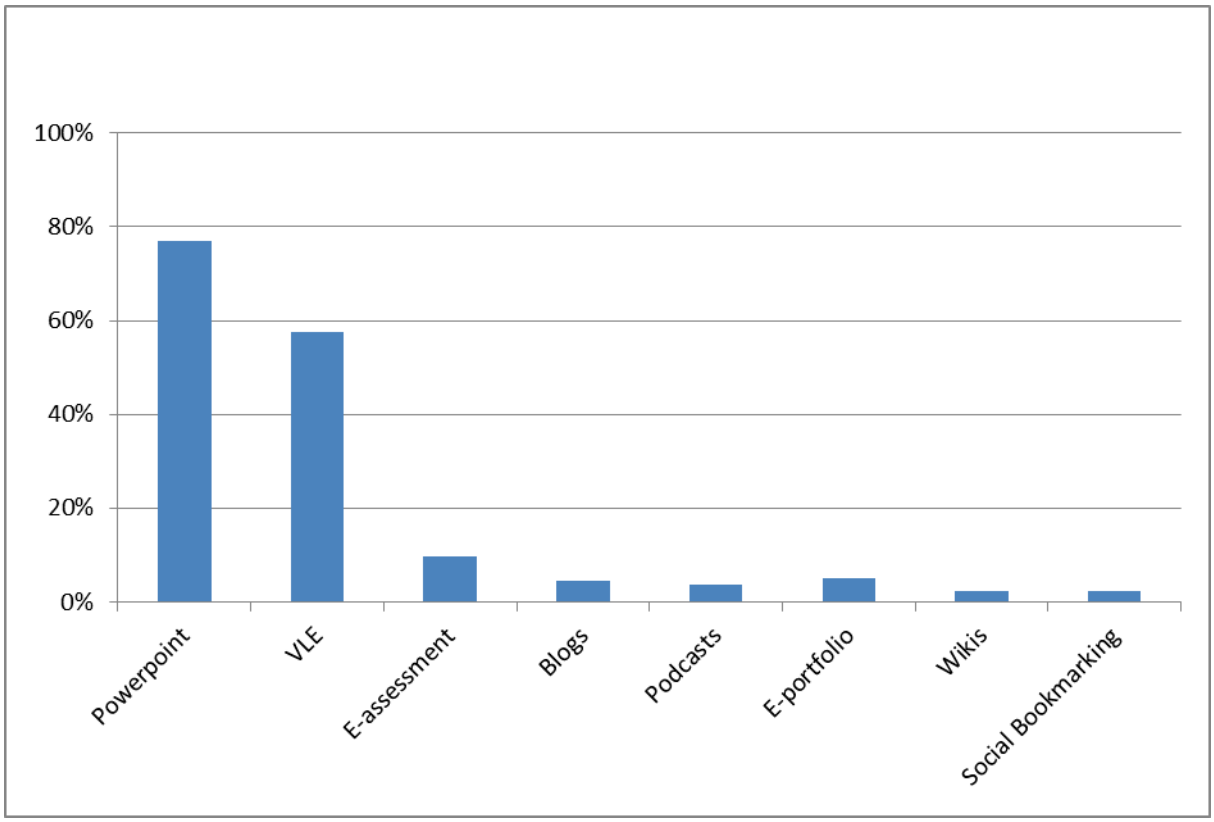

Table 3: Highest and lowest institutional users of specific technologies

Technology	Highest Users	Lowest Users
Slideshow presentations (powerpoint)	M,O,A	B,G,W
Virtual Learning Environment (VLE)	W,A,J	Y,B,M
E-assessment	O,J,Y	A,G,B
Blogs	A,G,W	M,B,F
Podcasts	A,G,O	Y,F,M
E-portfolio	M,J,A	Y,W,B
Wikis	G,O,W	Y,F,B
Social Bookmarking	O,A,G	M,Y,F