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Maximising motivators for technology-enhanced learning for further education teachers: moving beyond the early adopters in a time of austerity

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Technology-enhanced learning (TEL) has become a prominent issue in further education (FE) since the publication of the Further Education Learning Technology Action Group (FELTAG) report in 2014, but many initiatives have concentrated on digital competence without investigating the role of staff attitudes and motivation in extending their use of new technologies. This research explored the views and experiences of FE staff using technology to support learning and the impact of these on their motivation to develop a technology-enhanced curriculum in their subject. The aim was to identify any common themes or factors linked to positive engagement with TEL which could inform institutional efforts to increase the extent and effectiveness of TEL use. This research used a mixed-methods approach to attempt to provide a broader and more reliable view of attitudes and also considered the similarities and differences between the experiences of further and higher education teachers through comparison with Bennett's (2014) Digital Practitioner Framework and the particular barriers found in the resource-constrained environment of FE. It summarises the key factors identified as likely to influence staff engagement with TEL, and recommends how such motivating factors could be maximised and how potential barriers could be addressed.

Keywords: educational technology; FELTAG; investment; attitudes; barriers; further education

Introduction

The biggest influence on technology-enhanced learning (TEL) in the further education (FE) sector has been the publication of the Further Education Learning Technology Action Group report (FELTAG 2014). Of its 39 recommendations, 12 concerned the upskilling and development of the workforce however maximum attention was given to the recommendation that 10% of every learning programme should be online. Whilst this report successfully raised the profile of TEL in the FE sector, it also led to a focus on measuring the quantity rather than the effectiveness of online learning and an awareness of its potential as a cost-cutting option. Some colleges have introduced large-scale compulsory online learning elements to their courses seeking 'the promise, as yet unrealised, of using technology in a way that reduces the cost of learning by replacing the two most costly elements of provision, namely staffing and estate costs' (Ecclesfield, Rebbeck, and Garnett 2012, p. 48). Staff upskilling and development has

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received less attention, although the recent Digital Skills for the UK Economy report has continued this focus, stating 'a learner's digital education will depend on the digital competencies and skills of those teaching them' (ECORYS UK 2016, p. 4).

Many efforts to extend the use of technology in FE have focussed on assessing and developing the skills of teachers through audits and training activities (Coralesce n.d.; JISC 2015). This focus on digital competence assumes that increased technical skills will lead to increased confidence in using TEL and willingness to do so, but this cannot be taken for granted; some teachers with high personal digital competence may not utilise those skills on a regular basis to support their learners for other reasons, such as difficulties with organisational systems or failure to identify educational uses for the technologies they use personally (Ecclesfield, Rebbeck, and Garnett 2012, p. 49). The FELTAG Report highlighted the necessity of not only extending the digital skills of the FE workforce but also of educating the staff on how to harness these skills effectively to support the curriculum they deliver. This was echoed in the Digital Skills for the UK Economy report which concluded that teachers 'should be supported to develop their teaching approaches in line with developing educational technology' (ECORYS UK 2016, p. 6).

Bennett (2014) identifies 'skills' as a single level of her Digital Practitioner Framework (see Figure 1), giving it equal importance with that of 'access', 'practices' and 'attributes', and indicates that the experimentation and appropriation necessary to allow a teacher who has the appropriate skills and access to use technology effectively occurs at the higher levels of 'practice' (designing online activities and managing the online learning process) and 'attributes' – where 'new ways of working are assimilated into their beliefs and ways of operating' (Bennett 2014). To investigate these higher levels further, there is a need to examine teachers' values and attitudes rather than simply audit their skills.

Context

This research was undertaken in a large general FE college in the United Kingdom which provides a wide range of vocational education, from basic skills and entry-level courses to post-graduate qualifications. The college has Foundation degree awarding powers, allowing it to award its own level 5 qualifications and as with many FE colleges there has been a growth in Higher Education and Apprenticeship courses in recent years and an expansion in delivery to students beyond their local community. The college's TEL strategy aimed to develop a culture where 'eLearning' is not considered a separate priority but where the technology seamlessly supports the ability of the tutor to select the most effective tool or resource for delivery. Promotion of TEL has been based on a coaching model where 'champions' have modelled the use of technology in their subjects and provided peer coaching to other staff. Where this became embedded, the staff developed a strong sense of ownership towards the technologies they used – this reflects Ecclesfield, Rebbeck, and Garnett's (2012, p. 48) finding that 'staff prefer a more self-managed approach'. The staff who engaged with the coaching developed their confidence and transferable skills which enabled them to sustain their development as technologies evolved.

However, this philosophy of supporting teachers in making an informed choice about the technologies they use and allowing them to lead on the development of the materials for their subject has meant that TEL use has increased more slowly than in

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colleges that chose to use new technologies as a way of standardising approaches and centralising good practice (Ecclesfield, Rebbeck, and Garnett 2012, p. 48). Over recent years, the ability of the college to implement this strategy has also been restricted by limitations on resources – a problem common across the FE sector (Burke 2015) – leading to the removal of the role of the coach in eLearning and increasing teaching hours which limit the time available for staff to attend training and practice their skills. The college is currently re-evaluating its approach to TEL as, despite some areas of effective practice, the strategic vision and institutional buy-in necessary to ensure the diffusion of this good practice (FELTAG 2014) has not been established. If 'the use of digital technology in education is not optional' (ETAG 2014, p. 3), it is important to not only assess the digital competence of teachers but also their attitudes towards TEL. This research examined the attitudes and experiences of teachers to see if common factors that motivate staff engagement with TEL can be identified.

Review of previous research

Thousands of articles have examined the effective use of TEL (Brantley-Dias and Ertmer 2013, p. 103), but comparatively only few of these have focussed on vocational education (Hämäläinen and De Wever 2013, p. 272) and fewer still on the UK FE sector. Many TEL researchers have focussed on the 'macro' level of strategies and policies, which are frequently 'geared towards technically "literate" and innovative staff' (Singh and Hardaker 2014, p. 105); however, Bennett (2014) found that 'it was rare that increased access or skills drove adoption of teaching and learning practices'. If this is the case, then 'macro' approaches such as an institution-wide introduction of a particular technology or generic organisational training programmes are unlikely to lead to a sustained increase in the use of TEL and 'micro' approaches to engagement with technology which focus on attitudes and beliefs (Singh and Hardaker 2014, p. 105) may be more useful in understanding factors that influence engagement.

Models of TEL engagement

Beetham and Sharpe's (2011) model of student digital literacies suggests that access to and use of new technologies leads students to develop practices and a sense of digital identity which in turns motivates them to develop their skills further. Bennett (2014) adapted this model of student digital literacies to show that unlike students, access to technology may not be enough to stimulate experimentation among teachers, with movement up the pyramid only being evidenced at the higher levels.

Her model highlights that 'lecturers were mainly motivated by the desire to achieve their pedagogic goals' and that this rather than 'a desire to become a digital practitioner' encouraged them to adopt new practices, acquire new skills and seek out access to new technologies (Bennett 2014).

The importance of new technologies aligning with the teacher's pedagogical knowledge is also central to the TPACK model (Koehler and Mishra 2005) which has been used extensively, particularly in the United States, to examine teacher engagement with TEL. However, this model has been criticised for its complexity – using 'the Goldilocks principle' it is both 'too large' as a whole concept but also 'too small' in that the seven elements it defines are hard to distinguish from each other (Brantley-Dias and Ertmer 2013).

Digital competence and confidence

Teacher competence and confidence have both been identified as key factors in successful TEL adoption (Salmon and Wright 2014, p. 53); however, separating them can be difficult. Studies that ask teachers to self-assess their competence (Alazam *et al.* 2012; Hixon *et al*. 2012) are not just measuring competence but also confidence (either as well as or instead) – for example, asking a teacher if they can use social media safely will not tell you whether they can, only whether they believe they can. The fact that many research instruments designed to measure teachers' self-reported knowledge also contain elements of confidence and self-reported skills in this way can lead to questions about their validity.

The focus on measuring 'digital capabilities' in the FE sector through the provision of diagnostic tools and audits (Coralesce n.d.; JISC 2015) seems to assume that the provision of targeted training is enough to increase staff confidence – for example, the JISC Digital Launchpad claims to provide 'high quality resources that help you improve your digital confidence'. However, most of these resources are designed for self-directed study; for example, the Blended Learning Essentials MOOC (UFI 2016) and Beckingham and Nerantzi (2015, p. 110) note that these 'work better for highly-qualified individuals who have the confidence and competencies in open spaces as well as the skills to participate and learn in networks'.

Whilst both competence and confidence are important factors in increasing TEL use, confidence may be the more central concern. Ecclesfield, Rebbeck, and Garnett (2013, p. 50) believe it is 'key to the successful assimilation of technology into learning' and Prestridge and Tondeur (2015, p. 200) argue that TEL professional development should be 'about building teachers' confidence in change rather than evidence of ICT competence'. Ertmer *et al.* (2012, p. 434) also identify a need to 'reduce the fear associated with using technology' and Howard and Gigliotti (2016, p. 1362) conclude that there is a need to increase the teacher's ability to cope with stressful situations in order to encourage greater TEL experimentation.

Diffusion of innovation

Much research into the use of TEL has focussed on 'early adopters' (Bennett 2014), a concept taken from Rogers' 1995 model which defines innovation as 'diffusing' through the 'early adopters' to 'the early majority'. The term 'digital practitioner' (Ecclesfield, Rebbeck, and Garnett 2013, p. 50) is often used to describe teachers 'characterised by confidence in the use of technology' and this was linked by Bennett (2014) to the concept of 'early adopters'.

However, more recent literature does not necessarily evidence the progress from 'early adopters' to the 'early majority'; for example, recent research in the United Kingdom concluded that the digital skills of staff are uneven (ECORYS UK 2016, p. 4) and Beckingham and Nerantzi (p. 111) whilst supporting the belief that there are many 'digital practitioners' also refer to 'dinosaurs of the digital age' – staff who see themselves as 'immigrant educators' (White and Le Cornu 2011, 'Introduction', para. 2) and who require 'processes rather than projects' (White 2007, p. 849).

One distinctive problem with diffusion is 'heterophily' (Rogers 1995, p. 19) – the difference in competencies or attitudes between the early adopters or 'change agents' and those they are wanting to persuade. Early adopters may have already had good technical skills or previous TEL experience (Hixon *et al*. 2012, p. 103) or

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'a predisposition for trying new instructional innovations' (Howard and Gigliotti 2016, p. 1366) and could be seen as 'the same 10% of staff…that didn't need a lot of help in the first place' (Jones 2012). The early majority are less likely to be enthusiastic about, or confident with, technology, and White (2007, p. 849) concludes that there is a need to 'harness the early adopter's energy as a lever for systemic change'. This is likely to be challenging in some cases. Singh and Hardaker (2014, p. 114) identify that a teacher's attitude to technology comes from their own experiences as both a teacher and a student and in some cases reluctance may stem from deep anxieties about their own competence.

Risk and openness to change

As well as differing levels of confidence, the impact of attitudes to risk also needs to be considered. Whilst Ecclesfield, Rebbeck, and Garnett (2013, p. 45) stress the need for a 'curiosity-driven approach', this may be difficult to engender in staff with a more risk-averse personality. Many studies have noted the anxiety associated with the introduction of TEL (Singh and Hardaker 2014, p. 114) and Howard and Gigliotti (2016, p. 1355) identify the impact of a teacher's 'affective response' – their positive or negative emotions associated with taking that risk and the balance between anxiety and 'happiness' (or their belief in 'positive future expectancy, such as learning gains or higher student engagement').

All teachers perceive risks (e.g. technology failure) but those who have an 'openness to change' will perceive the risks as lower and the benefits as higher (Howard and Gigliotti 2016, p. 1366) and thus see a greater 'relative advantage' (Rogers 1995, p. 212). Ecclesfield, Rebbeck, and Garnett (2013, p. 50) identify that confident staff 'believe that the risks inherent in exploring new technologies to improve teaching and learning … to be worthwhile'. One key factor in increasing a teacher's 'openness to change' may be supporting them in developing 'coping strategies' that enable them to troubleshoot when problems occur, thus contributing to a 'virtuous circle' where successful use of TEL leads to further experimentation (Howard and Gigliotti 2016, p. 1366).

Organisational culture is also likely to impact on the willingness (or lack thereof) to take risks. White (2007, p. 849) suggests that 'the risk-averse mainstream' need the security of an evidence base and organisation-wide implementation to underpin their engagement with TEL, but in contrast Rogers (1995, p. 304) highlights the importance of 'diffusion networks' – peers who have successfully adopted the innovation – 'while information about a new innovation is usually available from outside experts and scientific evaluations, teachers usually seek it from trusted friends and colleagues whose subjective opinions of a new innovation are most convincing' (Sherry 1997 in Sahin 2006, p. 16).

Barriers and pedagogic innovation

Teachers seeking to engage with TEL may also be deterred by 'first-order barriers' (Ertmer *et al*. 2012, p. 433) which they perceive to be outside their control. These could be individual barriers such as time, lack of skills and lack of support (Reed 2014, p. 1) or organisational ones such as departmental culture, resistance to change, funding issues or lack of management support (Glover *et al*. 2016, p. 994).

However, 'second-order' (or internal) barriers are often seen as more important – Ertmer *et al.* theorise (2012, p. 433) that the difference between 'early adopters' and the 'early majority' is not external barriers but 'the relative weight assigned to [these]' and thus by reducing second-order barriers and increasing motivation to use TEL, teachers will find ways to overcome the first-order barriers in their settings.

Kim *et al.* (2013, p. 77) identify that persistent beliefs about current practice can act as second-order barriers and some have claimed that pedagogic change must underpin the effective introduction of TEL (Cochrane 2012; Prestridge and Tondeur 2015). However, it can be argued that increased use of TEL may in itself lead to more student-centred teaching (Howard and Gigliotti 2016, p. 1362) rather than a belief that student-centred teaching is required for technology integration to take place (Kim *et al*. 2013, p. 83). Where the introduction of new technologies has been used as a way of standardising approaches to teaching (Ecclesfield, Rebbeck, and Garnett 2013, p. 49), staff may 'fear … that their control over pedagogy…will be removed' (Singh and Hardaker 2014, p. 115). Armellini and Hawkridge (2012, p. 132) argue that what is needed is 'evolution not revolution' – so rather than placing the emphasis on pedagogical innovation and change (Cochrane 2012; Kim *et al.* 2013), maybe staff development should concentrate on developing 'good' rather than 'best' practice.

Methodology

Attitudes and beliefs are complicated to research as they are deeply held, sometimes at a subconscious level, and are often not clearly expressed. A mixed-methods approach was identified as suitable for this research, as this is a pragmatic method (Gray 2014, p. 195) which, instead of being purely positivist or interpretivist, seeks to combine methods to allow complex areas to be explored more fully. The methodology used in this research sought to integrate qualitative understanding of pedagogical beliefs with quantitative estimates of their impact (Tondeur *et al*. 2017).

Limitations to mixed-methods approaches include the risk that triangulation can lead to contradictory findings, but this was minimised by the exploratory nature of this research, which was designed to identify a range of factors rather than test hypotheses relating to their importance or any causal relationships. Any contradictions between the two types of data were viewed from a constructionist perspective of there being no 'single phenomenon' the research is trying to uncover' (Silverman 2013, p. 136), thus the findings of the focus groups are valid as an expression of the feelings and attitudes of those staff involved even if they conflict with the wider set of feelings and attitudes expressed through an anonymous questionnaire, in the same way that contradictory views will have been expressed within the focus groups themselves.

Staff views and experiences of using technology to support learning and the impact of these on their motivation to develop a technology-enhanced curriculum in their subject were explored through focus groups and an online questionnaire (see Appendix 2). The inclusion of a survey allowed additional data to be collected from a higher number of participants, as it could be completed at a time to suit them, whilst the use of focus groups encouraged deeper reflection through discussion.

Four focus groups (two with staff who taught predominantly FE courses, and two with staff who taught predominately HE Courses) were held and – 24 teachers participated across the four groups. Use of sampling frames is difficult with focus groups and in this case the subject areas were selected through 'volunteer sampling' (O'Leary 2014, p. 190) and the participants were selected through 'convenience sampling'

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(Plowright 2011, p. 43) based on those available at a particular date and time. Each group completed a 'Diamond 9' card sorting activity (See Appendix 1) to promote discussion of attitudes and experiences and try and limit discussion around first-order (external) barriers such as access, time and infrastructure (Ertmer *et al.* 2012, p. 433). Data from the focus groups were analysed using thematic analysis to identify research foci to inform the questionnaire design of the quantitative research (Silverman 2011, p. 210).

Seventy-eight staff completed a short questionnaire, designed to produce quantitative data on attitudes and emotions associated with TEL; this represented 20% of the total college teaching staff and 12 of the 13 schools/faculties. It primarily asked closed questions to allow for quick responses and was sent to all college teaching staff and filled in by a self-selecting sample. Stratified sampling was not used as the aim was not to examine links between attitudes and demographic factors such as age or gender but rather to identify common factors using as large a sample as possible.

This research was carried out in line with the BERA guidelines and the college's research ethics policy. Participants were provided with an information sheet which explained the nature and purpose of the research, including that this information was being provided for academic study rather than to college management. As focus group participants were invited through a 'gatekeeper', in some cases their line manager, at the start of each focus group, the researcher was careful to stress that participation was entirely voluntary to avoid any risks of coercion or duress. Whilst focus groups themselves cannot be confidential, recordings were used only for transcription by the researcher and the data collected were anonymised and participants were referred to using a number rather than a name (making it possible to remove the comments of any individual had they requested to withdraw).

There are many ways in which researchers can influence the data they collect; in this case, their role within the college as a 'champion' of TEL amplified the risk of a 'Hawthorne effect' (O'Leary 2014, p. 150) where participants modify their expressed attitudes and beliefs to fit with what they believe the researcher wants to hear. To address this, the researchers were careful to stress their role as researchers rather than colleagues and to remain professional and not enter discussions except when asked a direct question, although this was sometimes difficult when participants discussed areas where the researchers could have provided clarification. One of the purposes of the confidential quantitative survey that formed the second part of this research was to address any bias arising from the researchers' job role in the qualitative aspects.

Findings

The aims of this research were the following:

- Collate staff attitudes towards using technology to support learning in an FE college
- Identify any common factors linked to positive engagement with TEL
- Evaluate the data using Bennett's (2014) Digital Practitioner Framework to see if this model is applicable to the FE sector
- Recommend ways in which common motivating factors can be maximised

The scale of quantitative data collected allows some claims towards wider generalisation and thus meeting the first of these aims. However, 82% of respondents taught for more than 10 hours a week and 57% had some form of leadership responsibility

such as course leadership (see Appendix 3). Eighty-three per cent used technology to support their students at least once a week – this may indicate that the majority who completed the questionnaire are 'early adopters' and so the data may still not be representative of all college staff.

Both qualitative and quantitative data are evaluated below using Bennett's (2014) Digital Practitioner Framework (addressing the third research aim) –this enables assessment of how far this model encompasses the attitudes evidenced in the data and thus the extent to which it is applicable to the FE sector. As well as areas of congruence with this model, other areas appearing to influence staff attitudes are highlighted and discussed, in line with the first research aim. Consideration is given as to whether any common factors associated with high levels of TEL have been identified (to meet the second research aim) and how these can inform recommendations to increase the extent and effectiveness of TEL use within the college, in line with the fourth research aim.

Bennett's (2014) Digital Practitioner Framework: Access and skills

Factors relating to 'access' can be seen as 'enablers', in that they enable but do not 'drive' successful adoption of TEL. Three types of 'access' are identified – to devices and applications, to people who can provide support and to a network of ideas (Bennett 2014).

Unreliability of the IT infrastructure (including Wi-Fi) and unpredictability of access (e.g. consistency of hardware in teaching rooms) emerged as strong themes, in contrast to Bennett (2014) whose research in HE found 'an assumption that access to devices connected to the Internet was there when they needed it'. Howard and

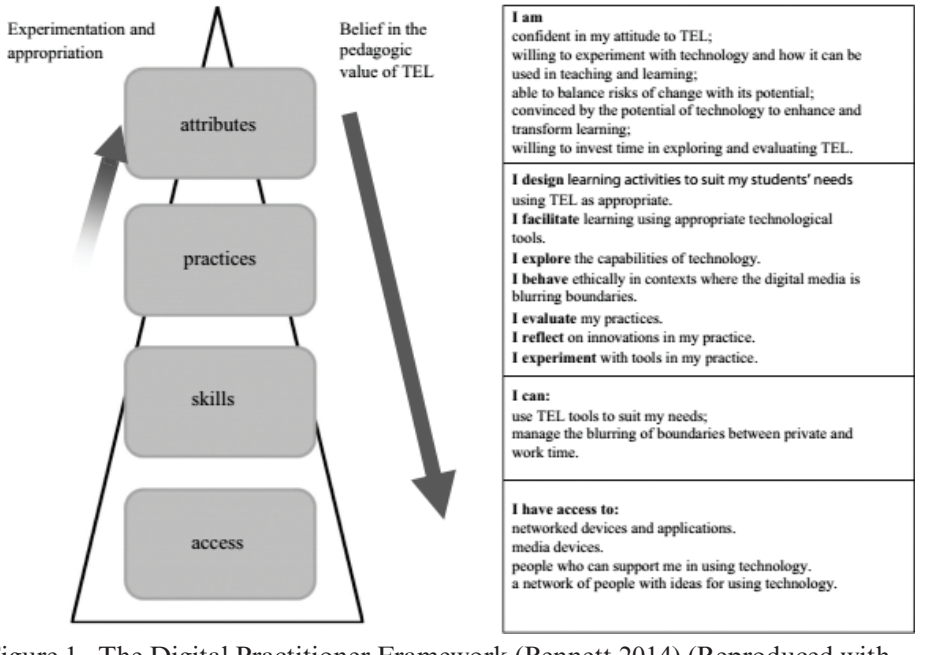

Figure 1. The Digital Practitioner Framework (Bennett 2014) (Reproduced with permission from Liz Bennett.).

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Gigliotti (2016) stated that teachers who are open to change develop 'coping strategies' to overcome the fear of risks (such as equipment failure). However, this research suggests that even confident teachers lose motivation when faced with persistent reliability issues – for example, one participant stated:

> It's not even just about enabling is it? How often does anyone want to do it [use TEL], if you go 'these resources are rubbish'? It's demotivating – like a blurred screen means you don't want to use video. (Participant 11)

Only 23% of questionnaire respondents felt identifying 'coping strategies' was a key problem (see Figure 2), yet two of the top three areas to encourage more TEL use were better access to equipment and improved Wi-Fi (see Figure 3). The frequent occurrence of this theme suggests that continued lack of investment in IT infrastructure has the potential to slow or even reverse TEL adoption.

Access to 'people to support me' (Bennett 2014) could take two forms – technical support and 'peer coaching'. Peer coaching could encompass both 'a network of people with ideas' (Bennett 2014) and Rogers' (1995, p. 321) 'diffusion' where 'most individuals do not adopt an innovation until after learning of their peers' successful experiences'. Peer support emerged strongly as a theme from the focus groups and can be seen as a driver for continued innovation, as well as an enabler for developing skills and confidence:

> I've come newly into this school and … eLearning is much more prevalent … and it's inspired me. (Participant 2)

> Once you've seen someone else do it and they have helped you through it, you feel confident to take some risks. (Participant 18)

A 'champion in my area' was ranked highly (see Figure 3) mirroring the fact that 'Colleagues' knowledge/expertise' and "Colleagues' commitment' were recently

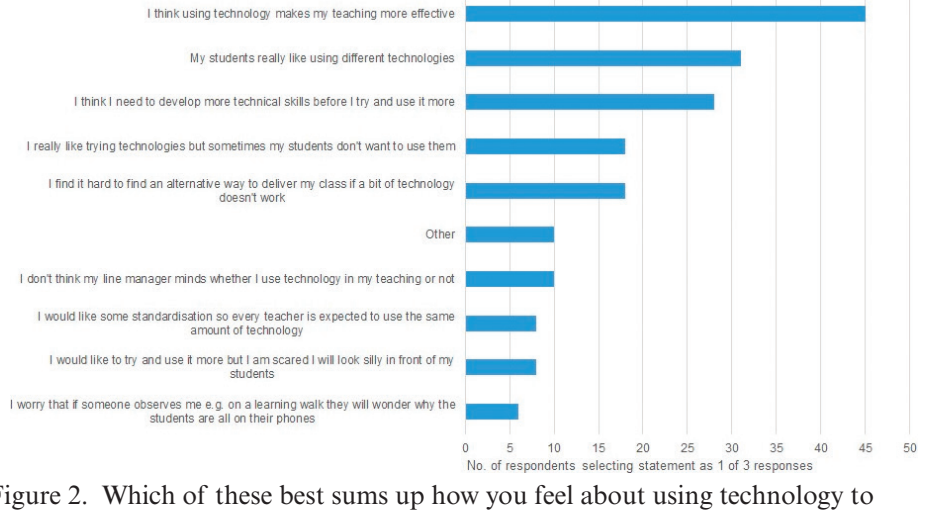

Figure 2. Which of these best sums up how you feel about using technology to support your teaching?

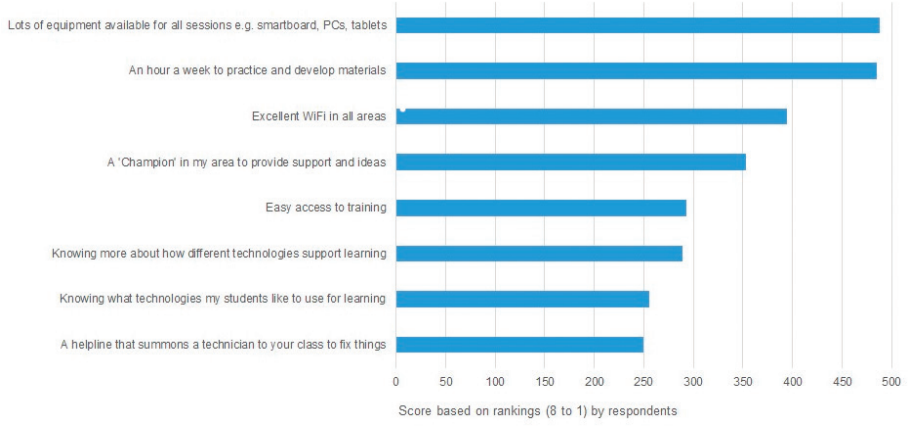

Figure 3. Which of these would encourage you to use more technology to support your learners?

identified as two of the top three drivers for TEL use (Hawksey 2017). The Horizon report (NMC 2017, p. 2) also supports the need for effective 'communities of practice', stating 'Collaboration is key for scaling effective solutions…. Institutions and educators can make more progress learning from each other'.

Thirty-six per cent of the respondents felt they needed to develop their technical skills, but this may reflect a desire to spend more time practicing and developing their confidence as well as for more training – Ecclesfield, Rebbeck, and Garnett (2013, p. 44) concluded that 'confidence in confronting technology to use in teaching is more important than the level of knowledge about the software':

> To me, having attended training and done a bit of it, you always need follow up training – you need to go away and have a play …and then you need training again to pick up the bits you missed. (Participant 14)

Bennett's (2014) Digital Practitioner Framework: Practices and attributes

These factors could be seen as 'drivers' – encouraging 'successful experimentation with TEL practices [which] led to developing confidence and thus their identity as a digital practitioner' (Bennett 2014). As this research focussed on attitudes, practices cannot be assessed except in so far as they link to attributes; for example, 'I experiment with tools…' links to 'I am willing to experiment…' (Bennett 2014).

Within attributes, Bennett (2014) includes the need for teachers to be 'convinced by the potential of technology to enhance and transform learning' – this was evidenced strongly in the HE focus groups:

> I don't think we need convincing that it is a good idea. (Participant 7)

but views were more mixed in the FE groups, with some seeing clear benefits:

> I have created videos and put them on to Moodle to make it easier to deliver courses because they can watch them, stop them, go back. (Participant 17)

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whilst others felt there were the limitations on its use:

> There are other methods of effective teaching – I think it's more to be seen to be doing modern things. (Participant 24)

The HE/FE split was not evident in the questionnaire responses, with 58% feeling using technology makes teaching more effective (see Figure 2).

Confidence [explicit in Bennett (2014)'s framework] and fear of failure were evident as themes:

> Sometimes you know about it and you know roughly how to do it but until you feel confident you feel silly doing it in front of the students. (Participant 20)

Participants also discussed balancing the risks of change with its potential and their willingness to experiment (Bennett 2014):

> So we'll take the risk and then we'll come back if it's gone wrong …Once it works you get inspired to make it better and better. (Participant 14)

Organisational culture was highlighted as a potential barrier (Tondeur *et al*. 2017):

> We had an environment where we could take risks and not worry about lesson plans [with a previous employer] – but in an environment where every element of your teaching was scrutinised I can see why people wouldn't want to do that. (Participant 11)

However, questionnaire respondents showed higher confidence than expected with only 10% of staff worrying about embarrassment in front of their students and 8% worrying about use of mobile devices in class being misinterpreted by managers (see Figure 2).

Time (highlighted as a theme) is difficult to classify, as it can be viewed as either a barrier (Reed 2014), a skill (ability to balance personal and work time – Bennett 2014) or an attribute (willingness to invest time in TEL – Bennett 2014):

> It's about time, you go on a course and think we could do this, this and this but you come back and we haven't got … the time to do it. (Participant 19)

> For me the biggest thing would be time – I think in our department we have got the skills and the confidence. (Participant 16)

Clay (2015) illustrates how many people who see time as a barrier are in fact demonstrating their lack of willingness to invest time and some participants supported this:

> If you are sufficiently interested you can make time to do it. (Participant 24)

However, 'An hour a week to practice and develop materials' was the second most popular suggestion (see Figure 3) and as workloads in the FE sector increase (UCU 2016) – this issue, as with problems caused by unreliable IT infrastructure, may mean even highly motivated staff can no longer create effective 'coping strategies' to compensate for the lack of investment:

> Time is important, if you've no time to do it in – we are already struggling for time. (Participant 18)

Other themes

Other themes apparent in the data which do not map directly to Bennett's (2014) framework included the role of TEL in meeting student expectations:

> You really want to be at least with the times if not ahead of them. (Participant 6)

> You will have teachers coming through who have been taught that way at school – so they will expect you guys to use it. (Participants 21 and 19)

One group even felt it might be necessary to challenge reluctant students to ensure they experienced the benefits of TEL:

> I think there's some sort of Luddism in the students – [they say] 'it's new I don't like it' – so therefore you might need to be persistent with it. (Participant 22)

However, as with the issue of pedagogic value, some groups felt there were limitations:

> You come to a college like this because you want to get your hands on, you don't want to be sat in front of a simulation. (Participant 24)

Generally though, TEL was seen as enhancing student engagement, with 40% of the respondents feeling their students like using new technologies (see Figure 2) – in line with ALT (Hawksey 2017), who found 'engagement from students' to be a key driver for TEL use.

The theme of organisational vision and strategy was also evident:

> There's got to be a vision, hasn't there. (Participant 13)

> Give me some targets to achieve and reward me for doing them. (Participant 9)

which supports the Horizon report (NMC 2017, p. 2) which identifies cultural transformation (including rewarding teaching innovation) as a key challenge to be addressed in order to accelerate technology adoption. However, only 10% of the questionnaire respondents wanted a standardised approach implemented and some participants felt more consultation was needed to inform organisational strategy:

> We often get told this is what you've got to work with – no – one never comes and says what would you like to work with. (Participant 24)

supporting the view that 'technology intervention in learning is fragmenting and is supporting highly individualised patterns of use – the common factor that holds it together is good teaching and learning and not uniform use of large centralised technology hosted by the employer' (Ecclesfield, Rebbeck, and Garnett 2013, p. 55).

Conclusion

The themes identified by this research closely reflect those identified by previous research in other sectors and countries as potential enablers or drivers to extend TEL use, including:

- the perceived value of TEL in supporting effective teaching (Bennett 2014; Koehler and Mishra 2005)

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- the existence of 'first-order' barriers such as infrastructure, time and technical skills, and the ability to develop 'coping strategies' to overcome these barriers (Ertmer *et al.* 2012; Howard and Gigliotti 2016; Kim *et al.* 2013)
- staff confidence, attitudes to risk-taking and openness to both pedagogical and technical change (Ecclesfield, Rebbeck, and Garnett 2013; Howard and Gigliotti 2016; White 2007)
- the impact of peer support, 'change agents' and access to a 'network of ideas' (Bennett 2014; Rogers 1995; Sahin 2006)

However, it also supports the findings of Tondeur *et al.* (2017) that the relationship between a teacher's beliefs and attitudes and their TEL use is complex and highly context-specific. It shows Bennett's (2014) Digital Practitioner Framework to be useful and applicable to the FE sector, in particular by highlighting that access to devices, applications and technical training is insufficient in itself to motivate use of TEL, and teachers need the opportunity to experiment and develop both their confidence and their identity as a digital practitioner.

In the FE context, other factors also influence TEL adoption, including enhancing student engagement, providing additional flexibility for 'non-traditional' students and developing digital capabilities, so that students are able to continue their learning in the workplace. However, the increasing limitations on resources present particular challenges as 'first-order barriers' such as unreliable IT infrastructure and limited time to develop skills and confidence are becoming increasingly prevalent. Whilst staff should be supported in finding 'coping strategies', it is apparent that these barriers are growing as investment in FE decreases, and they may act as 'demotivators', even for staff who have been highly motivated and effective TEL users and that this may slow TEL adoption in the sector significantly.

Maximising common motivating factors

Whilst the extent to which particular factors' impact on staff motivation to use TEL can be seen to vary widely by sector or individual institution, reflection on the themes identified through this research has led to the development of the following questions intended to support evaluation of the extent to which conditions to support positive engagement are maximised:

- Organisational culture
  - Does the organisation have a clear vision for the use of TEL and set expectations for its teachers?
  - Is there a supportive culture where staff feel comfortable taking risks?
  - Are staff supported in forming 'communities of practice' and in seeking ideas from outside the organisation?
  - Is the institution committed to developing the digital skills of its students to improve their employability and lifelong learning?

- Staff development
  - Do staff understand the pedagogical benefits of TEL and how to use it effectively?
  - Do staff have appropriate access to technical training and support?
  - Are staff given time to develop their skills and confidence?

- Resources
  - Do staff have 'predictable' access to IT resources?
  - Do staff have confidence in the IT infrastructure?
  - Is the institution aware of the types of technology accessible to their students and their preferences for how they are used?

Within the college, these could be used to structure discussions to identify priority areas for development and to inform the new TEL strategy.

Further research may be needed to assess the extent to which these findings still reflect the views of 'early adopters' and any additional problems of diffusing innovation to the 'late majority' (Rogers 1995, p. 262). Similar investigations in other institutions could indicate whether the factors highlighted are common across FE and provide a basis for cross-sector sharing of good practice and development of joint resources such as blended learning strategies and staff training programmes. If research is undertaken in the future, it might be interesting to use observational techniques to compare staff attitudes and their actual teaching practice and to examine whether belief in the value of TEL is primarily a knowledge-based deduction or an emotional response – Clay (2017) concludes that teachers asking for 'evidence' of TEL effectiveness may just be covering other issues such as risk adversity or lack of motivation.

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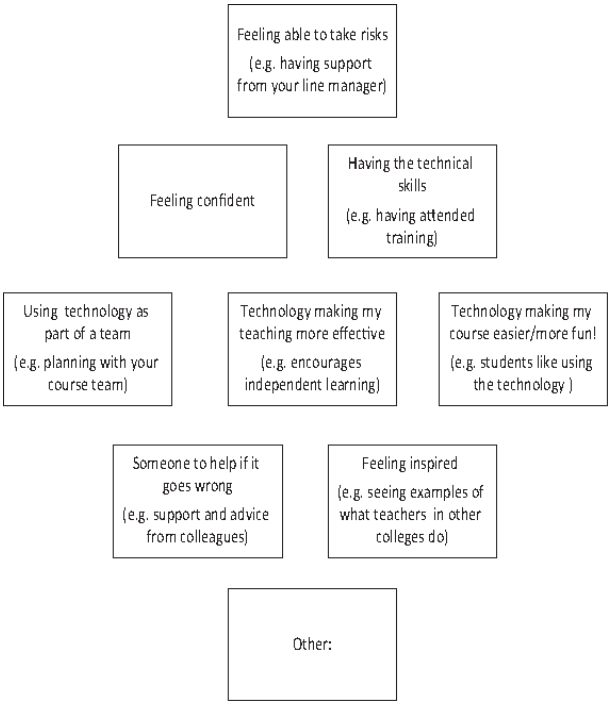
Appendix 1: Diamond 9 activity used in the focus groups

Which of these did or would encourage you to use technology in your teaching?



Appendix 2: Questionnaire

One person who complete this questionnaire will win an exciting and delicious mystery prize!

1. **School / Faculty** *
   Mark only one oval.
   - 14–16 College
     - ◯ Creative Arts
     - ◯ Construction & Green Energy Skills
     - ◯ Customer Service, Business & Leisure
   - Engineering, Computing & Science
   - English & Maths
   - Faculty of Arts
   - Faculty of Business & Science
   - Goole College
     - HCUK Training
     - ◯ Health, Care and Specialist Provision
   - Business and Professional Studies
   - Cultural, Contemporary & Heritage Studies
   - Other

2. **In an average week I teach for** * *Mark only one oval.*
   - 0–10 hours
   - 10–20 hours
   - More than 20 hours

3. **I am also** *Mark only one oval.*
   - A Head of School or TLAM
   - A Curriculum Leader or HE Subject Group Lead
   - A Teaching and Learning Coach or have another special 'B and B' type responsibility
   - None of the above

4. **How often do you use technology (other than just a Powerpoint) to support your students** *Mark only one oval.*
   - Most lessons
   - Several times a week
   - Once or twice a week
   - Less Often

5. **Do you provide online materials for your students?** *Tick all that apply.*
   - No
   - Yes - through Moodle
   - Yes - through Edmodo
   - Yes - by email _____
   - Other:

Your views on technology - enhanced learning

6. **Which of these best sums up how you feel about using technology to support your teaching? (tick up to 3)** *Tick all that apply.*
   - I would like to try and use it more but I am scared I will look silly in front of my students
   - I think using technology makes my teaching more effective
   - I think I need to develop more technical skills before I try and use it more

I worry that if someone observes me e.g. on a learning walk they will wonder why the students are all on their phones

   - I don't think my line manager minds whether I use technology in my teaching or not
   - I find it hard to find an alternative way to deliver my class if a bit of technology doesn't work
   - My students really like using different technologies
   - I really like trying technologies but sometimes my students don't want to use them

I would like some standardisation so every teacher is expected to use the same amount of technology

   - Other: _____

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7. **Which of these would encourage you to use more technology to support your learners?**

Rank the thing that would help you most as '1' and the thing that would help you least as '8'

* *Mark only one oval per row.*

	An hour a week to practice and develop materials	A 'Champion' in my area to provide support and ideas	A helpline that summons a technician to your class to fix things	Lots of equipment available for all sessions e.g. smartboard, PCs, tablets	Excellent WiFi in all areas	Easy access to training	Knowing more about how different technologies support learning	Knowing what technologies my students like to use for learning
1	◯	◯	◯	◯	◯	◯	◯	◯
2	◯	◯	◯	◯	◯	◯	◯	◯
3	◯	◯	◯	◯	◯	◯	◯	◯
4	◯	◯	◯	◯	◯	◯	◯	◯
5	◯	◯	◯	◯	◯	◯	◯	◯
6	◯	◯	◯	◯	◯	◯	◯	◯
7	◯	◯	◯	◯	◯	◯	◯	◯
8	◯	◯	◯	◯	◯	◯	◯	◯

Prize Draw

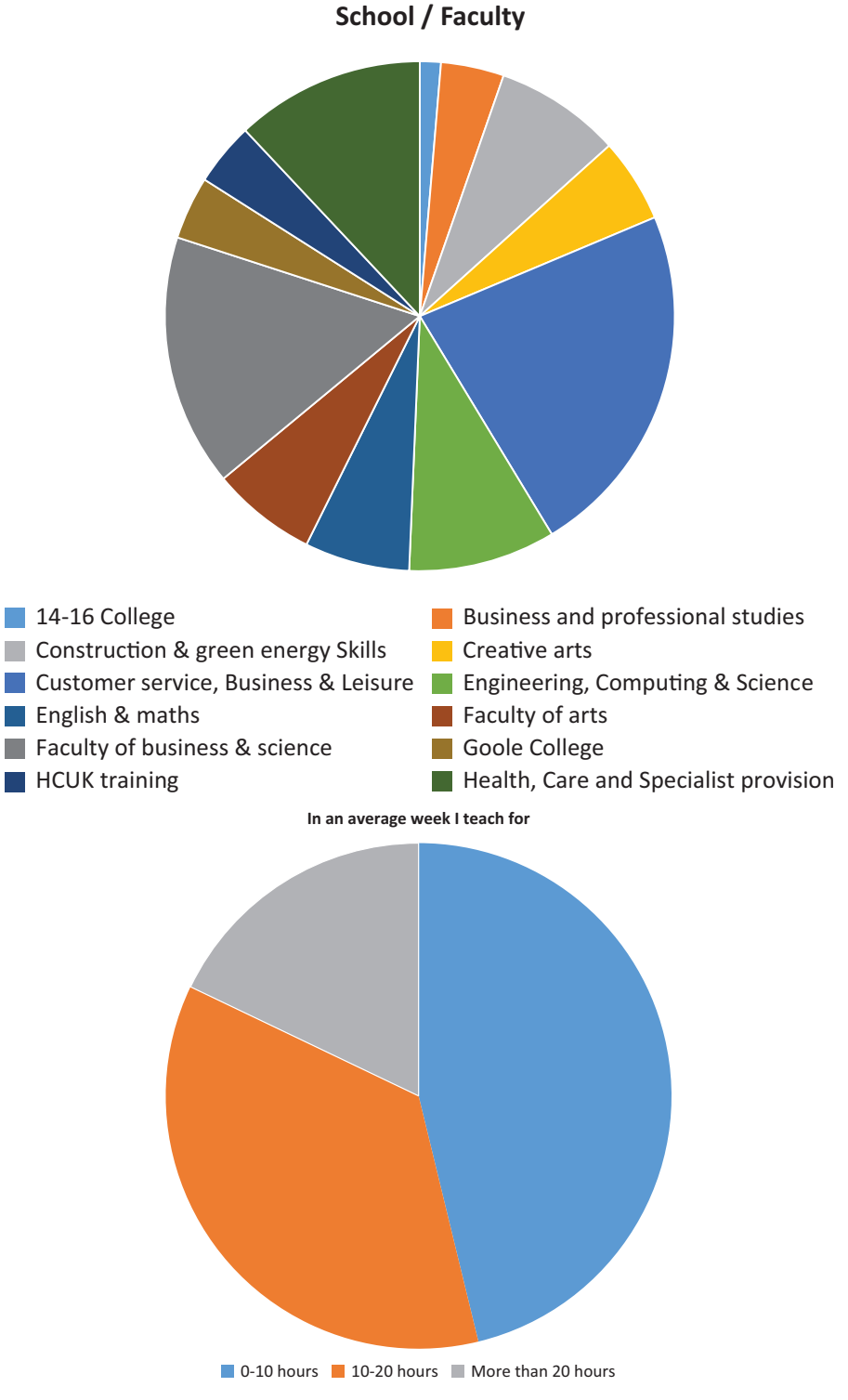
If you would like the chance to win an exciting and delicious mystery prize, please email earmstron g@ hullcolle ge.ac.uk with an message that says:

"I have completed your survey and would like the chance to win an exciting and delicious mystery prize"

Thanks for all your help

Emily

Appendix 3: Survey results



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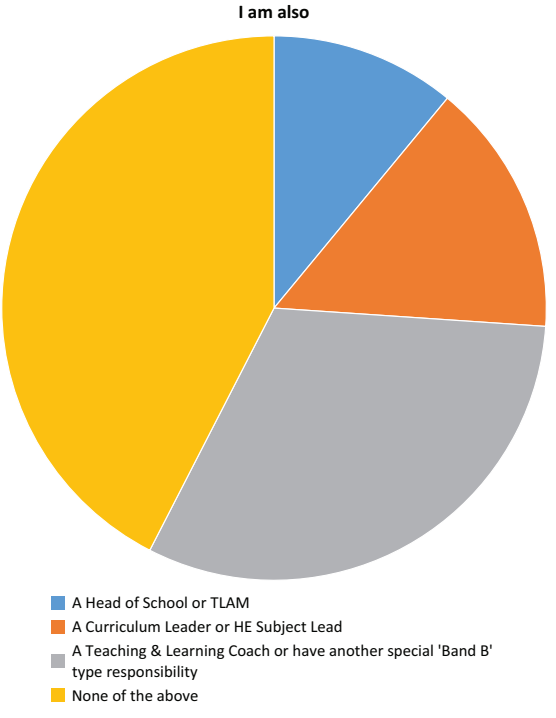
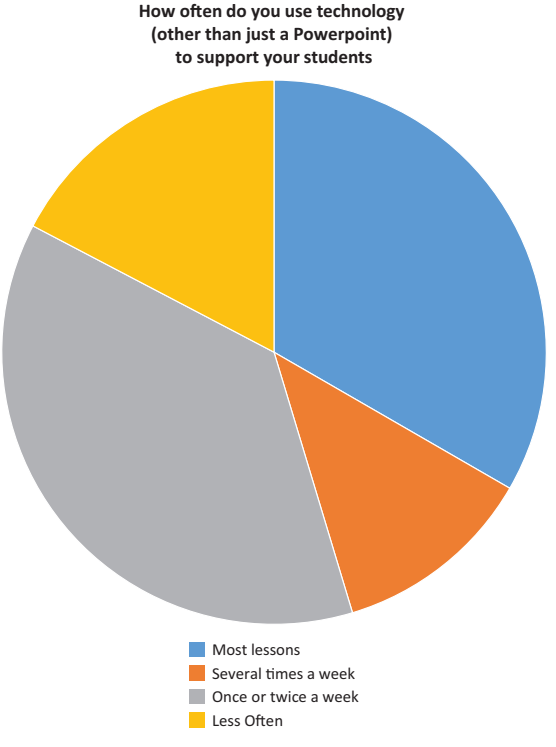
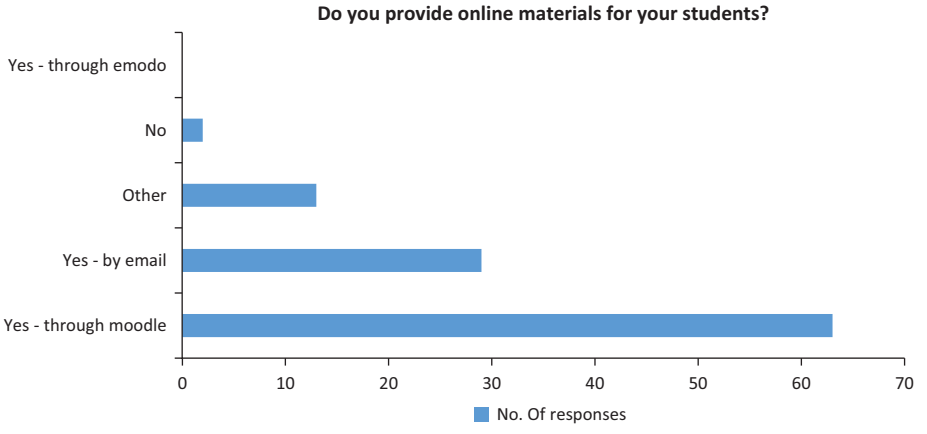
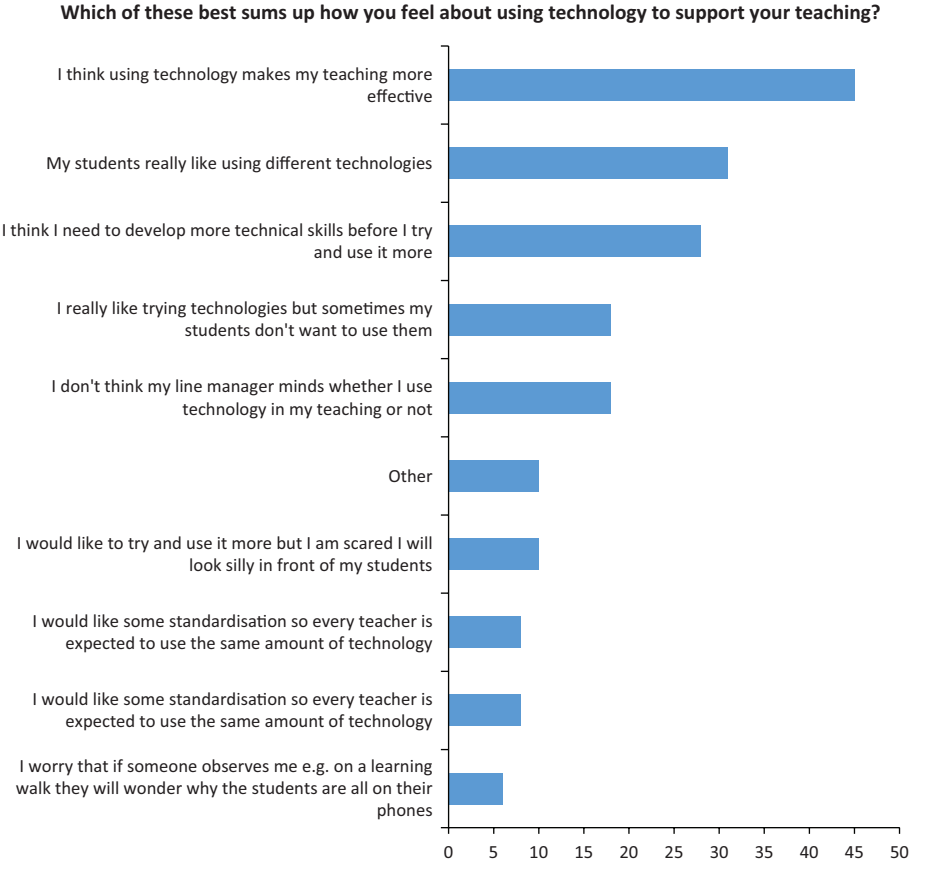

I am also
A Head of School or TLAM
A Curriculum Leader or HE Subject Lead
A Teaching & Learning Coach or have another special 'Band B' type responsibility
None of the above


How often do you use technology (other than just a Powerpoint) to support your students
Most lessons
Several times a week
Once or twice a week
Less Often





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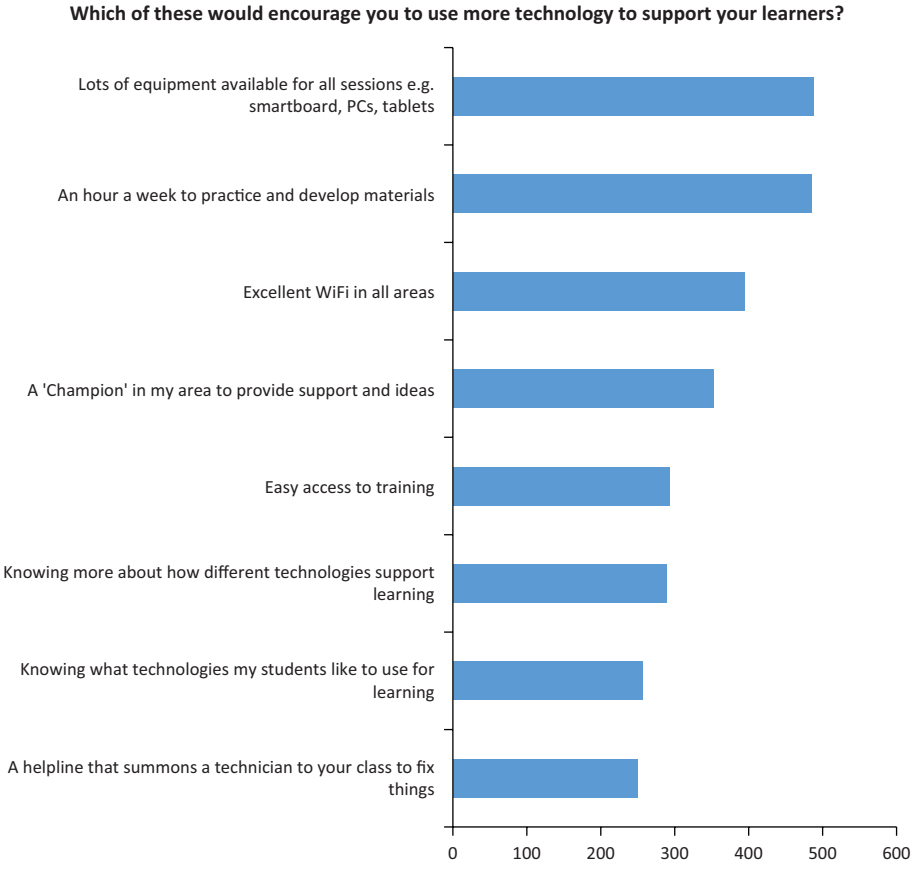
Which of these would encourage you to use more technology to support your learners?
Lots of equipment available for all sessions e.g. smartboard, PCs, tablets
An hour a week to practice and develop materials
Excellent WiFi in all areas
A 'Champion' in my area to provide support and ideas
Easy access to training
Knowing more about how different technologies support learning
Knowing what technologies my students like to use for learning
A helpline that summons a technician to your class to fix things
0
100
200
300
400
500
600