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## ORIGINAL RESEARCH ARTICLE

# UK higher education institutions' technology-enhanced learning strategies from the perspective of disruptive innovation

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The publication of institutional strategies for learning, teaching and assessment in UK higher education is practically ubiquitous. Strategies for technology-enhanced learning are also widespread. This article examines 44 publically available UK university strategies for technology-enhanced learning, aiming to assess the extent to which institutional strategies engage with and accommodate innovation in technology-enhanced learning. The article uses qualitative content analysis as its method, and uses the categories of disruptive innovation, sustaining innovation and efficiency innovation to evaluate individual institutional strategies. The article argues that sustaining innovation and efficiency innovation are more commonplace in the strategies than disruptive innovation, a position which is misaligned with the technology practices of students and lecturers.

***Keywords:*** disruptive innovation; technology-enhanced learning; strategy; higher education

## Introduction

The publication of strategies for learning, teaching and assessment in higher education is practically ubiquitous. The Universities and Colleges Information Systems Association (UCISA 2016) states, 'Institutional strategies continue to influence TEL [technology-enhanced learning] development, with Teaching, Learning and Assessment consolidating its position as the leading internal strategy cited by respondents' (p. 11); their research was based on a sample of 110 UK higher education institutions (HEIs). Furthermore, the Higher Education Funding Council for England (HEFCE 2009) acknowledged the importance of strategies in relation to technology-enhanced learning (p. 2). King and Boyatt (2014), in research undertaken with academic staff at the University of Warwick, also noted the importance of a technology-enhanced learning strategy (p. 1274). Moreover, Stensaker *et al*. (2007) noted the importance of a well-defined institutional technology-enhanced learning strategy (p. 418) in research conducted in Norwegian universities. In addition, we can be confident of the extent to which technology is used to support learning, teaching and assessment in higher education; Littlejohn, Beetham, and McGill (2012) and Henderson *et al*. (2015) note that students and lecturers use the Internet extensively to undertake research, and the widespread use of Google by students has been examined by Lawrence (2015).

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In view of the prevalence of strategy documents, a research project was undertaken in summer 2016 to examine the extent to which disruptive innovation (Bower and Christensen 1995; Christensen 1997; Christensen and Raynor 2003; Christensen, Horn, and Johnson 2008; Christensen and Eyring 2011; Denning 2016) features in strategies for technology-enhanced learning, a project which was useful for assessing the extent to which disruptive innovation is engaged with, accommodated and promoted in technology-enhanced learning in higher education in the United Kingdom. This article therefore aims to examine technology-enhanced learning strategies in relation to three categories: disruptive innovation, sustaining innovation and efficiency innovation. The article uses a directed approach with qualitative content analysis (Hsieh and Shannon 2005), taking the three categories derived from disruptive innovation theory, and using the categories as lenses through which to examine technology-enhanced learning strategies.

Specific questions considered in the research are as follows:

- How is innovation represented in HEIs' strategy documents?
- When innovation does feature in strategies, and what kind of innovation is emphasised: sustaining, disruptive or efficiency innovation?

Disruptive innovation has previously been used to analyse aspects of technology-enhanced learning in higher education (Flavin 2012, 2016a, 2016b), though not in specific relation to technology-enhanced learning strategies.

The article begins by summarising disruptive innovation. Then, it outlines the method by which the research was undertaken. It discusses its results with detailed reference to selected strategies, and argues in its conclusion that UK HEIs' strategies for technology-enhanced learning prioritise sustaining innovation and efficiency innovation over disruptive innovation, looking to augment and enhance technology-enhanced learning, but rarely to transform it. The article further argues that a ground-up approach to technology-enhanced learning strategies can foreground and lead to the accommodation of disruptive innovation in technology-enhanced learning in UK higher education, thus avoiding a mismatch between the approaches to technologies articulated through strategies, and the actual technology practices of students and lecturers. While it may be argued that institutions should not try to effect disruptive innovation because it occurs from the ground up through practice, one of the core contentions of disruptive innovation is that disruptive technologies unseat established technologies (Christensen 1997; Christensen and Raynor 2003); it is therefore a good idea for universities to at least be aware of disruptive innovation, because otherwise their strategies run the risk of being or becoming moribund, as they get outflanked by the day-to-day practices of students and lecturers.

## Disruptive innovation

Disruptive innovation is a theory about goods and services. Bower and Christensen (1995) first published on disruptive innovation in *Harvard Business Review*, associating disruptive technologies (individual manifestations of disruptive innovation) with the emergence of new practices from the ground up. Christensen presented a fuller discussion of his theory in a book of 1997, constructing a dualism between technologies that enable us to do something we had already been doing a little better than


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before (indicative of sustaining innovation), and technologies that prompt new practices (indicative of disruptive innovation). The distinction is expressed synoptically in the following quote:

> What all sustaining technologies have in common is that they improve the performance of established products…. Products based on disruptive technologies are typically cheaper, simpler, smaller, and, frequently, more convenient to use. (Christensen 1997, p. xv)

More recently, Christensen (Denning 2016) has added a third category of efficiency innovation, which makes it possible to do more with less.

Google is an example of a disruptive innovation. It is convenient, simple and free. Furthermore, purposes for Google are constructed by its users; designers provide the platform but do not dictate the practice. However, as Google has grown, it has developed niche products and services offering a range of tools, from specialist academic searches to document composition and storage, and thus developing its initially disruptive innovation along sustaining innovation lines. Christensen, Horn, and Johnson (2008) argue that disruptive innovations become sustaining innovations over time, an argument made more recently regarding technology-enhanced learning by Yamagata-Lynch, Cowan, and Luetkehans (2015).

Christensen, Raynor, and McDonald (2015) argue that Apple's iPhone is a good example of a disruptive innovation:

> The product that Apple debuted in 2007 was a sustaining innovation in the smartphone market: It targeted the same customers coveted by incumbents, and its initial success is likely explained by product superiority. The iPhone's subsequent growth is better explained by disruption—not of other smartphones but of the laptop as the primary access point to the internet.

The iPhone was initially a sustaining innovation, but it enabled disruption through its ease of use, encouraging experimentation and innovation by users; the iPhone and similar devices are portable and provide quick and easy access to the Internet. The iPhone is therefore a good example of how technologies become disruptive and innovative through practice from the ground up.

Technology-enhanced learning can be related to all three of Christensen's categories; new technological possibilities can comprise disruptive innovations, sustaining innovations comprise the ongoing development of existing technologies and efficiency innovations are distinct because they are potentially pedagogically constrictive and can threaten academic practice from the opposite perspective to disruptive innovations, although efficiency innovations also offer economies of scale. Christensen, Bartman, and van Bever (2016) argue that efficiency innovations 'reduce cost by eliminating labor or by redesigning products to eliminate components or replace them with cheaper alternatives' but acknowledge that the approach can lead to 'a race to the bottom'. By using technologies to enable higher student-to-staff ratios, a transmissive curriculum can ensue, in the sense that students are positioned as the passive recipients of content, rather than engaged co-constructors of knowledge. Moreover, efficiency innovation can impact on universities' library services, as web-based tools can supplant academic librarians; costly specialist databases can get superseded by Google Scholar and similar applications, as Karlsson (2014) notes. Efficiency innovation can result in streamlined practices enabling jobs to be done, but at the same time

it can pose a threat to jobs if the rationale underpinning efficiency innovation is solely concerned with doing more with less.

Aspects of disruptive innovation have been applied to education previously. Sharples (2002) focussed on a prototype device used to support schoolchildren's learning, and in this sense his approach was akin to sustaining innovation as he anticipated 'future mobile devices to be designed so that they provide just the tools that are required or allowed in different contexts' (p. 14). Furthermore, Conole *et al*. (2008) undertook a survey of 427 students, suggesting pedagogical practices were not changing radically because of the advent of digital technologies. Conole *et al.* (2008) also highlighted a problem, namely, 'a mismatch between our current offerings and student use and a further mismatch between institutions' perceptions of student use of technology and actual use' (p. 519), a finding which this research endorses. Moreover, Meyer (2010) argues that technologies acquire value through practice rather than their intrinsic qualities (p. 226), a view advocated in disruptive innovation (Christensen and Raynor 2003).

Disruptive innovation has critics. Markides (2006) argues it is possible to create disruption, citing Amazon and Swatch, neither of which created a new product or service but both of which were disruptive of existing markets. While disruptive innovation argues that disruption comes out of practice, Markides (2006) argues it can be created consciously through marketing. However, the fiercest criticism of disruptive innovation has come from Jill Lepore. In a 2014 article in the *New Yorker*, she describes disruptive innovation as 'a theory of history founded on a profound anxiety about financial collapse, and apocalyptic fear of global devastation, and shaky evidence', gaining ubiquity 'only after 9/11'. She criticises Christensen's use of the case study as his main research instrument (a criticism of disruptive innovation also made by Danneels [2004, 2006]), which allows Christensen to retrospectively handpick instances that validate his argument. In this specific sense, Christensen's approach is problematic. The focus of Christensen's work, however, is on innovation in relation to goods and services. Consequently, to extrapolate from Christensen's argument to a broader geopolitical context without nuance is itself problematic, as it is not a full and fair reflection of Christensen's actual position. The same might be said of applying disruptive innovation to technology-enhanced learning in higher education, but Christensen and his co-authors have applied disruptive innovation to education in a book about disruptive innovation in the school system in the United States (Christensen, Horn, and Johnson 2008), and to higher education (Christensen and Eyring 2011) without the theory giving way under the strain (Flavin 2016a, 2017).

## Method

In order to identify strategies for analysis, the second author undertook desk research via Google, using search terms including 'university teaching and learning strategy', 'university technology-enhanced learning strategy' 'university e-learning strategy' and 'university ICT strategy'. Other terms used included 'HEI' instead of 'university', or the '@ac.uk' suffix, alongside 'strategy' and 'technology'. Forty-four strategy documents were selected by these means. Ten were stand-alone technology-enhanced learning strategies, while 34 were teaching and learning strategies with a technology-enhanced learning component therein. Data from the Higher Education Statistics Agency indicate there are 167 higher education providers in the United Kingdom


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(HESA 2017); hence, the sample represents 26.35% of UK HEIs. All the strategies used for this article were in the public domain when the research was undertaken.

Four strategies out of the 44 were selected for a pilot study (Coventry, Queen Mary, Bristol, and University of the West of England [UWE]). The rationale for the selection was to look at strategies from different higher education mission groups though, in practice, the analysis of the pilot study and of the full sample did not identify significant variations by mission group. Coventry and UWE are both post-92 universities (former polytechnics), traditionally associated with skills development and employability. Bristol and Queen Mary are both Russell Group universities, generally older institutions with a greater focus on research. The first author undertook a word search for 'innovation' in the strategies. Truncated versions, for example, 'innovat' were also sought, to encompass adapted terms such as 'innovate', 'innovating' and 'innovative'. Additional, specific phrases were sought out through word search, including disruptive innovation and sustaining innovation, as were specific technologies, including Google. Detailed readings of the four, individual strategies were undertaken. Both authors examined each of the four strategies in the pilot separately, and cross-checked findings to support internal reliability. The level of agreement was very high.

As the research was interested in specific characteristics of strategies and in the examination of language, the approach can best be described as content analysis (Bryman 2016). Moreover, by focusing on how innovation featured in the strategies, the research was interested in both manifest and latent content, the latter comprising 'meanings that lie beneath the superficial indicators of content' (Bryman 2016, p. 284). In practice, while strategies might proclaim a manifest commitment to innovation, the latent content can expose an, at best, qualified commitment to innovation. Bryman (2016) argues content analysis is as interested in omissions as in what does get reported (p. 287), and Krippendorff (2013) states, 'Content analysts are as interested in what is not said as they are in what is said' (p. 360).

Although the presence of the word 'innovation' was counted in the strategies, an acceptable approach in content analysis (Bryman 2016, p. 289), it may be more precise to describe the approach as qualitative content analysis with a directed approach (Hsieh and Shannon 2005). Bryman (2016) describes qualitative content analysis as, 'A searching-out of underlying themes in the materials being analysed' (p. 563), which is a core objective of this research, examining each strategy in relation to these three categories. Furthermore, a directed approach to qualitative content analysis starts with a theory. In the case of this article, the theory of disruptive innovation provides the three categories of disruptive innovation, sustaining innovation and efficiency innovation. Moreover, qualitative content analysis with a directed approach is used in order to validate a theory and extend its applications (Hsieh and Shannon 2005, pp. 1281, 1283); its use in this article enables disruptive innovation to be applied to UK HEI technology-enhanced learning strategies.

Regarding the strategies used for the pilot study, Coventry University, in an eight-page, 3295-word document, identifies 'digital literacy' as one of its five key themes (Coventry University 2011, p. 3). The strategy acknowledges, implicitly, disruptive innovation by identifying, 'the extent to which students are encouraged and empowered to drive innovation in learning on the course through digital technologies and applications' as 'a barometer for digital literacy' (p. 7), the verb 'drive' implying the possibility of ground-up innovation by students. It is, however, also possible that students could opt to pursue incremental improvements in technology usage, or greater

efficiency, in preference to disruptive innovation. The strategy mentions 'innovation' three times, comprising one mention every 1098.3 words, to one decimal place.

The Queen Mary University strategy (20 pages, 5729 words) identifies the importance of learning technologies in its introduction (Queen Mary University 2010, p. 3). Section eight of the strategy focuses on learning technologies, and aligns with all three of Christensen's categories: 'To use learning technologies to achieve efficiency… enhancement … and transformation … in order to improve the student experience' (p. 10). Thereafter, however, in a side column of 126 words headed 'e-learning', the strategy mentions 'to enhance' twice but does not mention transformation, inclining the strategy more towards a sustaining innovation approach (p. 11). The strategy mentions 'innovation' or adaptations thereof (e.g. 'innovative') seven times, comprising one mention every 818.4 words, to one decimal place.

The three-page, 1183-word University of Bristol Technology-Enhanced Learning Strategy (University of Bristol 2012) stresses practice ('We will prioritise those things which will assist in delivery of our educational vision, rather than starting from the availability of a particular technology' [p. 2]). However, in its 'key messages' section, it adopts a sustaining innovation approach, 'Enhancing the user experience for students, academics and support staff' and 'Enhancing the exploitation of existing resources before developing new initiatives' (p. 3). The strategy mentions 'innovation' or adaptations thereof six times, comprising one mention every 197.1 words, to one decimal place.

The UWE strategy (eight pages, 1301 words) lists efficiency, enhancement and transformation as its three external considerations, deriving the categories from the HEFCE, revised technology-enhanced learning strategy (2009). The HEFCE strategy identifies efficiency, enhancement and transformation as three different levels of technology-enhanced learning intervention in its executive summary (2009, p. 2) but does not link the categories to Christensen's work. UWE's strategy identifies the commercial potential of technologies, stating, 'The UK HE market is crowded and competitive, and rapidly-developing learning technologies can give institutions a competitive edge if they are recognised and cultivated early enough' (UWE, 2012, p.2). The strategy mentions 'innovation' or adaptations thereof four times, comprising one mention every 325.2 words, to one decimal place.

Following the pilot study, the same method was applied unamended to the remaining strategy documents, as useful, relevant information had been gleaned from the pilot study.

## Results and discussion

Of the 44 strategies sampled in total, 14 did not mention innovation at all. Twenty-four strategies mentioned the word 'innovation' or adaptations thereof one to five times, and six strategies mentioned it 6–10 times. Two mentioned it nine times and two mentioned it 10 times (the most times it was mentioned); the average number of mentions for innovation was 2.8, with a mode of two. Four strategies were selected for closer analysis. They were selected largely on the grounds of convenience; all four strategies were still publically available by the time the analysis was undertaken, whereas some of the other strategies identified at the outset of the research had been superseded by new institutional strategies, or were no longer publically available. Moreover, as the four strategies were from the Russell Group of universities, the selection enabled some like-for-like comparison.


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The University of Edinburgh's 'IS Technology-enhanced Learning Strategy 2014–2017' (eight pages, 2797 words) states, as part of its mission, 'We lead, innovate and collaborate to develop and support high quality learning technology that enriches student experience and outcomes' (University of Edinburgh 2014, p. 2). Within the strategy, innovation (or adaptations thereof) is mentioned four times, comprising one mention every 699.2 words, to one decimal place. Edinburgh's strategy leans towards sustaining innovation, aiming to provide students with 'increased online access to course materials' (p. 2). That said, in a 64-word column headed 'management', the strategy states, 'identify opportunities for innovation and emerging technologies in TEL' (p. 2), implying that innovation is to be a top-down process, a position advocated for the higher education sector by Walker, Voce, and Jenkins (2016, p. 446) but contrary to the process of disruptive innovation as outlined by Christensen (Christensen 1997; Christensen and Raynor 2003; Christensen, Raynor, and McDonald 2015). Innovation is present in Edinburgh's strategy but practice is not preeminent. Instead, technology takes precedence over practice, focusing on how technologies enhance experience but not on how practice determines which technologies are used, and not on the extent to which they are used innovatively.

Individual strategies reveal different dispositions towards technology-enhanced learning. The University of Cambridge Learning and Teaching Strategy 2015–18 (2015, eight pages, 2705 words) states, 'The General Board's approach to technological innovations and the use of technologies in teaching and learning will be driven by the Board's pedagogical priorities' (p. 6), foregrounding a top-down approach. The same strategy also states, 'the Board recognises that the ways in which the University engages with student learning, and vice versa, could *harness* ongoing technological developments' (p. 7, emphasis added), a verb choice which implies a resistance to the disruptive possibilities of technology. Moreover, the strategy elsewhere endorses efficiency innovation: 'A strategy for use of technology to enhance learning and teaching will … recognise that technology offers opportunities to reduce resources spent on the teaching of basic material and concepts and giving feedback, and thereby to make teaching and learning more efficient' (p. 7). The strategy mentions innovation or adaptations thereof three times, comprising one mention every 901.6 words, to one decimal place.

The University College London (2016) strategy (28 pages, 8189 words) features mixed approaches. Under a wider initiative of the connected curriculum, the strategy states, 'The Connected Curriculum … resonates fully with the principles of innovation and disruptive thinking that we associate with UCL's founders' (p. 7), later identifying 'ease of use' (p. 17) as a means of enhancing the student digital experience, with ease of use comprising one of the core characteristics of disruptive innovation (Christensen 1997, p. xv). However, this apparent commitment to disruption is subverted by, 'the existing virtual learning environment (VLE) will be *augmented* by a set of communication, collaboration and productivity tools' (p. 17, emphasis added), which indicates a sustaining approach, developing an existing, institutional technology. On the same page, the strategy states that technology 'supports authentic, creative and collaborative learning, enables a wide range of assessment approaches, augments face-to-face contact and encourages productive learning outside of the classroom' (p. 17), verb choices which lean towards a sustaining approach, facilitating rather than disrupting existing modes of learning. That said, the strategy's commitment to ensuring that students are engaged in driving the digital agenda (p. 17) suggests a ground-up approach, if not exclusively so, contradicting Walker, Voce, and Jenkins (2016) but

in line with Marshall's (2010) argument that organisational change in HEIs can be top-down, ground-up or a combination of both (p. 182). The strategy mentions innovation or adaptations thereof 10 times, comprising one mention every 818.9 words.

The University of Oxford's (no date) Digital Strategy (online, unpaginated, 722 words) follows the sustaining innovation approach, 'The university will sustain and enhance its excellence in scholarship by embracing the opportunities afforded by digital technologies'. However, the strategy does not advocate a top-down approach: 'the University will support and engage with digital initiatives generated by our staff, students, alumni, and those outside the university', thus potentially opening itself up to a disruptive innovation pathway. This possibility is expanded by the strategy's aim of 'Creating an Innovative Digital Community, focussed on significant innovations, cutting-edge thinking, and sharing and implementation of best practice, e.g. through the creation of a university-wide conversation on digital innovation', and underlined by the strategy's objective of 'providing a foundation for the transformative enhancement of research, teaching and innovation through digital technologies and communications'. While a sustaining approach is adopted, practice is foregrounded over technology, allowing for the possibility of disruption. The strategy mentions innovation or adaptations thereof five times, comprising one mention every 144.4 words.

The analysis of the strategies suggests UK HEIs acknowledge the significance of practice but are less welcoming of innovation. There were isolated examples of disruptive innovation, if only by implication, but the strategies examined were more likely to feature commitments to sustaining innovation, applicable to both students and lecturers: 'To provide a learner-centred approach focusing on enhancing the learner experience through the appropriate and consistent use of technology' and 'To ensure that Sheffield academics are enabled to enhance their teaching with the appropriate use of technology to provide students with the best possible learning experience' (University of Sheffield 2012, p. 2). Efficiency innovation is also present in the strategies, aiming to support the effective completion of tasks, making existing technologies serve learning and teaching more efficiently: for example, The University of Cambridge strategy aims to 'make best use of technology to enhance provision' (p. 2), having defined the purpose of the learning and teaching strategy as, '… to *maintain* the internationally recognised quality of the student experience in Cambridge and to *enhance* it where appropriate' (p. 1, emphasis added). The strategy adds that technology will be used 'to make teaching and learning more efficient' (p. 7).

The data for this article are limited by the size of the sample. The data are also limited by the fact that institutional strategies are updated and replaced and therefore some of the strategies analysed for this article are no longer extant. There are also limitations arising from the method, for example, searching for the term 'innovation', as Krippendorff (2013) notes: 'taking single words as units disregards their role in sentences, so that their syntactical meanings are lost' (p. 365). Moreover, 'Given that the answers to content analysis research questions are inferences from texts about not-yet-observed phenomena, these answers are always of hypothetical validity' (Krippendorff 2013, p. 368), and 'Particular problems are likely to arise when the aim is to impute latent rather than manifest content … the potential for an invalid conjecture being made is magnified' (Bryman 2016, p. 305). In addition, as inferences are drawn from the strategies, there is some susceptibility to subjectivity (notwithstanding that both authors worked separately on the strategies), making it more difficult to replicate the study. Future research might look at how strategies are put together: either top-down via management edict or ground up from students, lecturers and support staff


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or a mixture of both, because those who produce strategies are significant actors, determining strategies' contents: as Krippendorff (2013) argues, 'content analysts must look outside the physicality of texts – for example, to how people other than the analysts use these texts, what the texts tell them, the conceptions and actions the texts encourage' (p. 29). It may therefore be valuable to examine the extent to which strategies are representative of the stakeholders whom they affect. Disruptive innovation could also be used as a theoretical lens in a directed approach to qualitative content analysis, in order to evaluate other institutional documents, such as mission statements.

## Conclusion

The examination of UK HEIs' technology-enhanced learning strategies indicates a willingness to adapt on the part of universities but a disinclination to disrupt. Universities can describe themselves in their strategies as innovative yet, in practice, they are often ameliorative, more likely to pursue sustaining or efficiency than disruptive innovation. Notable verb choices in the strategies examined (e.g. 'enhance', 'augment' and 'support') suggest the objective of developing existing resources and practices along sustaining innovation lines but not of disrupting them. The manifest content can espouse innovation, but the latent content exposed through verb choices indicates otherwise. The strategies suggest UK HEIs are adopting a largely sustaining innovation approach to technology-enhanced learning, aiming to enhance existing provision incrementally.

In day-to-day practice, students and lecturers engage with disruptive innovation through the use of simple and convenient, non-institutional technologies (Flavin 2012, 2016a, 2016b, 2017), but institutional rhetoric adheres more closely to sustaining innovation, proposing the enhancement of institutional technologies. Moreover, widespread practices by students, such as the use of Google, are largely ignored in the strategies. The University of Exeter's (2009, rev. 2011) strategy does propose piloting 'the use of Google apps as a tool to support collaborative working' (p. 10), and the University of Greenwich (2013) mentions the use of Google Scholar (p. 7) and Google Docs (p. 9), but the focus in the strategies sampled is, consistently, on institutional technologies, which tend to be sustaining technologies.

As documents represent a university's commitment, if not necessarily its practice, strategies for technology-enhanced learning signify an institutional preference for sustaining innovation and efficiency innovation. Students' and lecturers' practice with disruptive technologies is largely ignored, despite being a key determinant of the purposes to which technologies are applied. Jones (2012) argues, 'the future of university provision is a choice and not the result of a technologically determined process' (p. 36) but, on the basis of the strategy documents sampled, the choices made are unimaginative, focused on making existing practice more efficient rather than rethinking practice; Marshall (2010) notes that universities, 'as yet show little capability to disrupt their existing educational models' (p. 188). Moreover, Karlsson (2014) asks, 'Should it [the HEI] continue to invest millions in making available information resources when free alternatives are consolidating their strength?' (pp. 1664–1665), but HEIs in the sample did not engage substantially with disruptive technologies, though they do seemingly welcome the efficiency advantages conferred by technologies.

There is an argument for the production of technology-enhanced learning strategies based more explicitly on practice rather than on the technologies themselves,

recognising that technologies have no inviolable, intrinsic purpose but acquire purpose through human agency, realising and releasing their disruptive potential through ground-up practice. Walker, Voce, and Jenkins (2016) argue, 'general pushes for adoption of TEL tools need to come from the top of the institution and be communicated downwards' (p. 446), but a disruptive innovation analysis argues innovation is a ground-up process, as users create purposes for technologies, including non-institutional technologies, which strategy documents often ignore.

There is an institutional willingness to embrace sustaining innovation and efficiency innovation but a disinclination to engage with disruptive innovation. If students and lecturers continue to use disruptive technologies widely, as indicated by research (Henderson *et al*. 2015; Littlejohn, Beetham, and McGill 2012), there will continue to be a misalignment between HEIs' strategies regarding technology-enhanced learning, and the day-to-day practices of students and lecturers.

## Author Biographies

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